DBCT 2015 DAU
Review of the Economic Life of DBCT Assets

Final Report

A Confidential Report by Resource Management International
for the
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Executive Summary

The Queensland Competition Authority (QCA) commissioned Resource Management International in November 2015 to independently assess Dalrymple Bay Coal Terminal Management's (DBCTM) proposed weighted average mine life (WAML) methodology for determining the economic life of the DBCT assets (Stage 1), and to undertake an independent review of mine life within the DBCT catchment area. The review included an independent assessment of a report by Wood Mackenzie entitled 'Shipper Mine Life Analysis'.

RMI agrees with DBCTM's assessment that the current coal industry is more competitive than was the case in previous reviews, due fundamentally to the current low coal price environment. As a dedicated coal export terminal, with no alternative use, DBCTM has sought to address the risk of assets becoming stranded by linking DBCT asset life with the viable life of mines it services. RMI does not disagree with this approach, but notes that mine life has been considered in past reviews with the result that it would likely out-last the current DBCT lease period.

In assessing the WAML methodology, it is important to note the coal market forecast context and the relative competitiveness of Bowen Basin mines globally. RMI agrees with Wood Mackenzie's assessment that world demand for metallurgical coals, which will continue to dominate DBCT throughput, will persist and grow over the forecast period to 2035. The fundamentals of continued demand for steel in China, and likely demand growth in India and SE Asian developing countries, that don't have their own sources of metallurgical coal, suggest that demand for Australian metallurgical coal will likely persist beyond 2035.

The Wood Mackenzie report also shows that mines within the Hay Point catchment area are now and in 2021, generally in the lower part of the mining cost curve for metallurgical export coal, and predominantly at the high end of the cost margin curve. In other words they are globally very competitive. Mines supplying Hay Point terminals are also well placed geographically, and from a coal quality point of view, to remain very competitive in the currently changing coal market place. The current coal industry downturn is, however, resulting in delays to new projects and mine extensions, but as the current over supplied metallurgical coal market rebalances, many of these planned projects will become globally competitive in the medium to long term.

The proposed WAML methodology has been applied to 26 operating mines within the DBCT catchment area, including BMA controlled mines (Wood Mackenzie, 2015), using marketable reserves, ROM Company reserves and marketable production rates to determine mine life. Four scenarios have been considered, with WAML estimated to be 20, 25, 26 and 35 years in four different scenarios. DBCTM's preferred option is 25 years, which was the average mine life weighted by marketable reserves derived from the Wood Mackenzie Coal Supply Service market analysis model.

RMI considers that the proposed DBCT asset life period of 25 years significantly underestimates the likely supply of coal to the DBCT, and disagrees with the methodology on the basis of the following main concerns:

- The weighted average period does not fully represent coal supply to the port over the full period of potential supply, by disregarding a significant 'tail tonnage' from mines with mine life longer than the weighted average;
- The weighted average calculations include BMA coal that is mostly delivered to the Hay Point Coal Terminal. Therefore the resulting weighted average is not representative of coal supplied to the DBCT, particularly because many of the BMA controlled mines have the longest life;
- The weighted average uses only 'reserves', and appears to disregard Measured and Indicated Resources (exclusive of reserves), which in terms of the JORC code and Australian coal industry convention, may legitimately be used for mine planning purposes;
- The weighted average excludes all projects from the analysis, on the basis that the likely start-up of new projects is beyond the next 5 year regulation period and therefore speculative. Given the Wood Mackenzie medium to long term forecast for positive metallurgical coal demand and the data presented showing the competitiveness of Bowen Basin mines, RMI considers that viable projects should be included in the analysis, which should be over the full physical life of DBCT assets.

Therefore for a number of reasons, RMI considers that none of the WAML estimates are appropriate for determination of the economic life of DBCT assets, including the preferred WAML estimate of 25 years average mine life used in the 2015 DAU. A more realistic coal supply forecast would include all Measured and Indicated resources, and given the medium to long term forecast for positive metallurgical coal demand, also new projects with a reasonable likelihood of development.

An independent review of the mine and likely project life has been undertaken, using a similar methodology to that used in the 2005 DAU review, where the economic life of DBCT assets is determined by dividing indicative marketable reserves by current DBCT capacity. Inclusion or exclusion of new projects in this analysis has been determined by a project ranking system, where either brownfields or greenfields projects have been ranked according to the level of mining feasibility work done. Projects involving only thermal coal production have been assessed as having a lower level of viability than equivalent metallurgical coal projects.

Using this method, there are sufficient indicative marketable reserves from **existing operations and advanced projects** to potentially supply coal to DBCT for at least 31 years from 2015, including an assumed 5Mtpa from BMA/BMC controlled mines. RMI considers that the positive medium to long term outlook for seaborne metallurgical coal, is a basis for also including some greenfields projects with significant Measured and Indicated JORC resources, but no reserves, in which case there would be sufficient indicative marketable reserves to supply coal to DBCT for at least an additional 9 years.

Our estimate of the economic life of DBCT assets using this methodology is therefore 40 years from 2015.

As this methodology and the DBCT proposed WAML methodology both do not identify when the supply of coal may start to decline, and when there may be insufficient supply to economically sustain DBCT function, a second approach involving scheduling of annual production from existing mines and new projects has also been explored. The analysis confirms that there is currently more than sufficient indicative marketable reserves within the catchment area to maintain DBCT at close to current capacity to at least the end of the current lease period in 2015.

It is recommended that this scheduling approach may be useful in the future to better identify the time at which coal supply may conceivably drop below an economically sustainable level. Although we do not expect that this will occur within the current lease period, we believe this is a superior approach that recognises a viable ‘tail tonnage’, of which a portion could support the port operation.

Table of Contents

List of Figures

List of Tables

Introduction

The Queensland Competition Authority (QCA) commissioned Resource Management International (RMI) in November 2015 to independently assess Dalrymple Bay Coal Terminal Management's (DBCTM) proposed weighted average mine life (WAML) methodology for determining the economic life of the DBCT assets, as proposed in the 2015 Draft Access Undertaking (2015 DAU). The economic life of DBCT's regulated asset base (RAB) is used for depreciation purposes and for determination of annual return on capital. The 2015 Access Undertaking provides a framework for third parties to negotiate access to the coal export terminal managed by DBCTM, over the next 5 year regulation period.

The QCA has provided RMI for review a copy of DBCTM's 2015 DAU submission and a report by Wood Mackenzie (WM) entitled 'Shipper Mine Life Analysis', which forms Appendix A of the 2015 DAU. Other information accessible included relevant publications available from the QCA website.

The scope of work for the full consultancy is in accordance with the Terms of Reference document also provided by QCA. However, it was determined to undertake the project in three stages:

- Stage 1: review the proposed WAML methodology and relevant background information to assess the appropriateness of the methodology for determining the economic life of regulated DBCT assets;
- Stage 2: undertake an independent review of mine life within the DBCT catchment area, subject to the result of Stage 1; and
- Stage 3: Consideration of stakeholder comments on the DBCTM's proposal and finalisation of reporting.

This report concludes Stage 2.

Scope of Work

The QCA has commissioned RMI to:

1. undertaking an independent, expert review of the economic life of DBCT, including the assumptions used to generate an estimate of mine lives in the Hay Point catchment area;
2. provide a critique of:
    a. The Wood Mackenzie consulting report, including the appropriateness of the WAML assumptions, analysis and recommended options for assessing the economic life of DBCT assets;
    b. DBCTM's preferred WAML option for assessing the economic life of DBCT assets, including analysis and explanation of whether DBCTM's preferred option is appropriate (or not).

In undertaking these tasks RMI was required to:

- Clearly explain the differences between the consultant's independent assessment and the Wood Mackenzie report/DBCTM position;
- Assess whether the proposed WAML methodology provides an appropriate measure of economic life of DBCT, including
    - definition of operating and prospective mines within the Hay Point catchment area;
    - assessment of the Wood Mackenzie treatment of prospective mines in the catchment area;

    - estimation of coal reserves and life of each mine or project included in the catchment area (Stage 2 as required);
    - a review of other relevant matters to the calculation of the WAML.
- Assess whether other methodologies, including the additional methodologies provided in the Wood Mackenzie report, could provide a more appropriate estimate of DBCT's economic life;
- An independent assessment of the economic life of DBCT, including an estimate of likely coal reserves within the catchment area, and consideration of reasonable assumptions on coal extraction and handling rates.

The Port of Hay Point

The Port of Hay Point is located 38 km south of Mackay on Queensland's east coast (Figure 1). It is the largest of four coal export port terminals servicing Queensland. The Port of Hay Point includes two separate coal terminals, being the Dalrymple Bay Coal Terminal (DBCT) and the Hay Point Coal Terminal (HPCT).

Dalrymple Bay Coal Terminal

The DBCT is a multi-user coal export facility, which is owned by the Queensland Government and leased to DBCT Management Pty Ltd (DBCTM). The current 50 year lease expires in 2051 (DBCT Management, 2015), at which time there will be an option for a further 49 year lease period. The DBCT is currently managed by Brookfield Infrastructure through DBCTM. The DBCT is declared for third party access under the Queensland Competition Authority Act, with terms and conditions of access regulated by a QCA approved access undertaking.

The capacity of the DBCT is currently 85Mtpa. There are four coal loading berths and three ship loaders (DBCTM website). The DBCT has been progressively expanding it's capacity, with stepwise expansions from 53.2Mtpa in 2005 to 85Mtpa from 2010. Utilisation has ranged mostly from 73% - 85% during the last 5 years, with a reduction to 60-65% utilisation during 2010 and 2011 when significant flooding in Queensland impacted deliveries (Table 1).

Table 1: Port Hay Point Throughput and Capacity

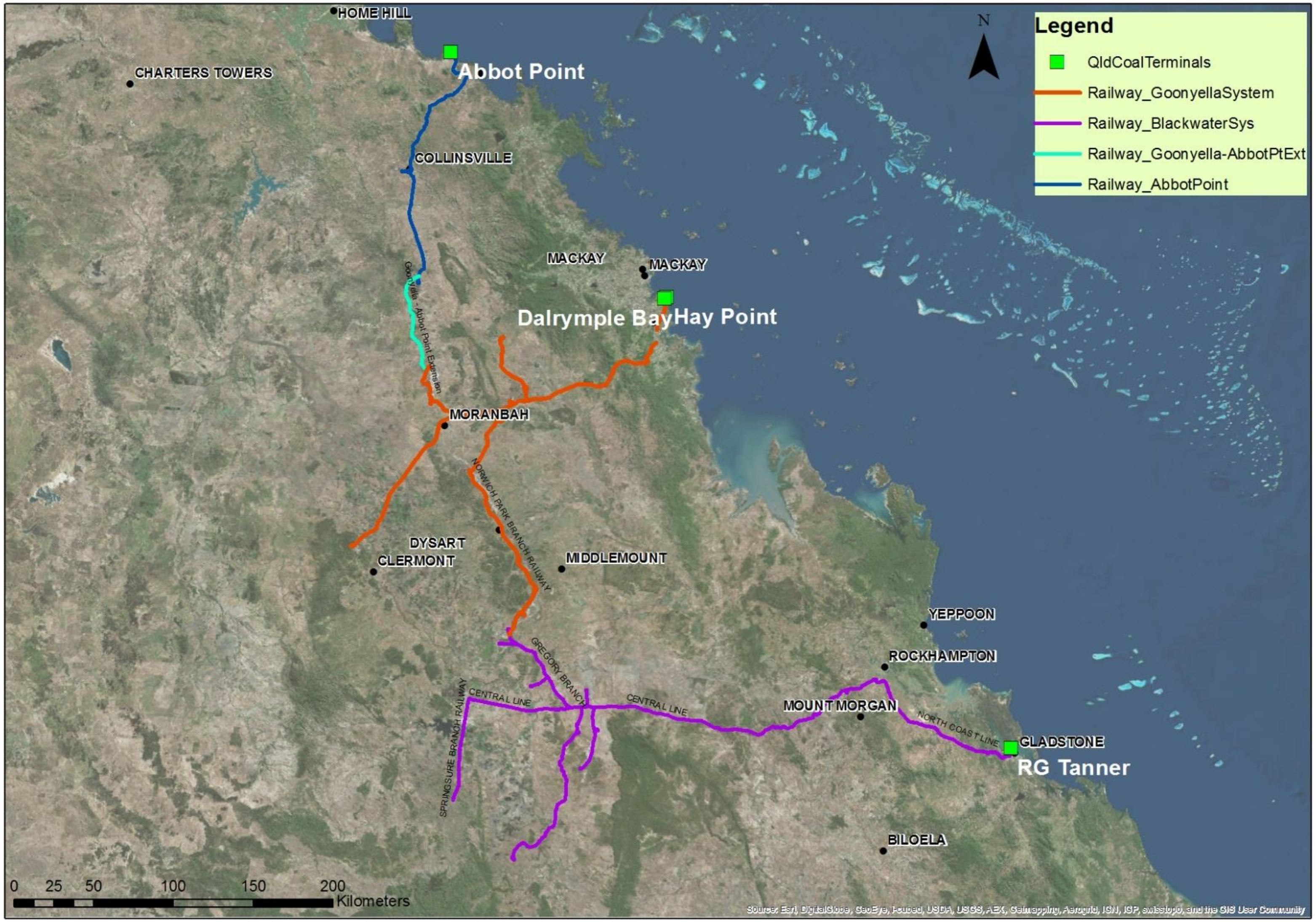
Year (YEJ)	DBCT			HPCT			Total	
	Loaded *	Capacity	Utilisation	Loaded **	Capacity	Utilisation	Loaded	Utilisation
2015	72.01	85	85%	43.42	44	99%	115	89%
2014	67.96	85	80%	40.84	44	93%	109	84%
2013	62.4	85	73%	34.34	44	78%	97	75%
2012	51.47	85	61%	32.04	44	73%	84	65%
2011	54.88	85	65%					
2010	63.7	85	75%					

* Sourced from DBCTM annual reports

** Sourced from Hay Point website (http://www.nqbp.com.au/hay-point/)

RMI is not aware of any expansion plans at DBCT in the foreseeable future, and none would be expected in the near term given existing capacity and the current weak demand for seaborne metallurgical and thermal coal.

Figure 1: Queensland Coal Infrastructure



Hay Point Coal Terminal

HPCT is owned and operated by BHP Billiton Mitsubishi Alliance (BMA), and used solely for coal exports from BHP controlled mines on the Goonyella Rail Network (Figure 1). Some coal from BMA and BHP Billiton Mitsui Coal (BMC) controlled mines has been exported through the DBCT, including coal from the BMC Poitrel and South Walker Creek mines (Wood Mackenzie, 2015). The BMA/BMC throughput entitlement is unknown, but has been estimated to be 3-5Mtpa (Energy Economics, 2005).

BMA increased capacity at HPCT during calendar year 2015 from 44 to 55 Mtpa, with the official opening by Premier Annastacia Palaszczuk on the 16 December 2015. Utilisation of the HPCT in the last 4 years has increased from 73 – 99%.

Wood Mackenzie (WM) report that total Hay Point terminal utilisation remained below capacity during the period from 2006 to 2010 as the DBCT was expanded to 85Mtpa, due to Goonyella Rail Network (GRN) network capacity constraints (Wood Mackenzie, 2015). Utilisation also significantly reduced during the 2010 – 2011 flooding period. Total Hay Point utilisation (both terminals) has increased since the 2010-2011 flooding period from 65% to 89%.

Capacity constraints on the GRN have now been addressed through Aurizon's Goonyella Rail Expansion Project, which started early in 2013 to increase capacity from 129Mtpa to 140Mtpa. This is exactly in line with the 11Mtpa increase in HPCT capacity. The current status of the Goonyella Expansion Project is stated on the Aurizon website as under construction, with major elements completed and the final stage to be completed in mid-2015 (Aurizon, 2015).

Wood Mackenzie report combined exports from the two Hay Point terminals will likely total 100-115Mtpa (71 – 82% utilisation) over next 10 years due to weak metallurgical coal demand (Wood Mackenzie, 2015). However, they also report increasing metallurgical coal supply from Australia from about 2023 (in 8 years), as demand for seaborne metallurgical coal and Australia's market share increases. Most of this additional supply is likely to come from Queensland' Bowen Basin, due in part to a drop off of supply from New South Wales.

RMI is unaware of any future plans to significantly increase capacity at the HPCT from 55Mtpa, and none would be expected in the near term given the existing capacity and current weak demand for seaborne metallurgical coal.

DBCT Catchment Area

The DBCT and HPCT catchment area is essentially defined by the Goonyella Rail Network (GRN) system, which is the shortest rail link to a coal export terminal for Bowen Basin operations from North Goonyella and Hail Creek in the north, Blair Athol in the west and Oaky Creek in the south (Figure 2).

Other known projects within the DBCT catchment area, which are considered to have a low level of potential viability, are listed in Appendix B4.

Table 2 and Appendix B1 list operational mines within the Hay Point catchment area, of which most are operating and some have recently closed or are currently on care and maintenance. Total exports from Hay Point terminals in YEJ 2014 from BMA and BMC controlled mines was approximately 57.2Mt. Total exports from DBCT from other mines in YEJ 2014 were about 109Mt.

The Goonyella Rail System is connected to the Blackwater System in the south, and now the Goonyella-Abbot Point System in the north. The Blackwater Rail System therefore provides a potential rail link option to the RG Tanner and WICET coal export terminals near Gladstone, particularly for mines and projects at the southern end of the DBCT catchment area. Similarly, recent completion of the 69km rail connection to the Newlands Rail Network (GAP project) in 2011/2012 provides a potential rail link option to the Abbot Point coal terminal in the north, particularly for mines and projects at the northern end of the DBCT catchment area. Also, conceivably the DBCT provides a coal delivery option for mines and projects to the north and south of the traditional DBCT catchment area.

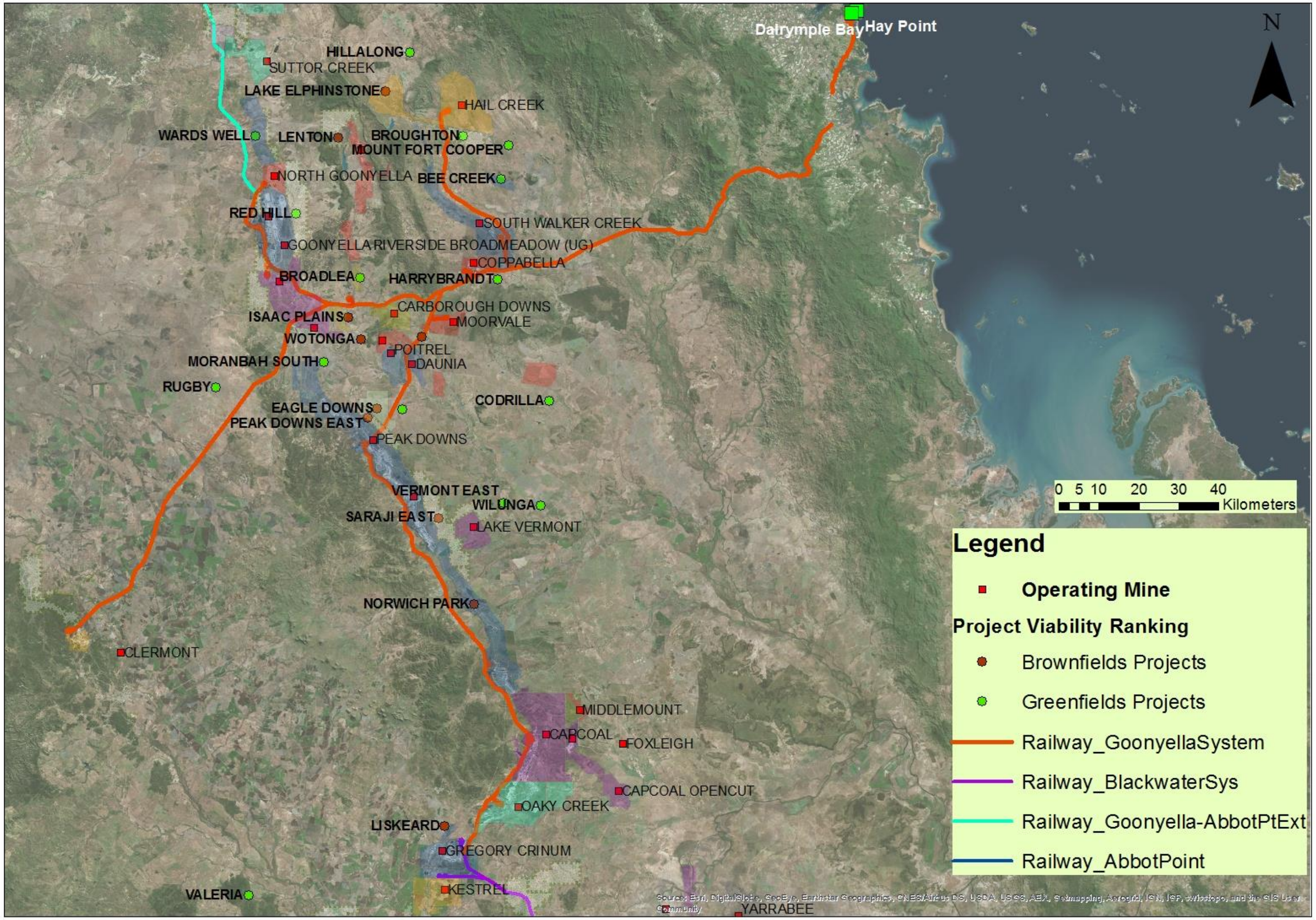
A list of mining projects in the DBCT catchment area, which are at an advanced stage of development, is presented in Appendix B2, while a list of other projects, which are considered to be potentially viable, is presented in Appendix B3. Other known projects within the DBCT catchment area, which are considered to have a low level of potential viability, are listed in Appendix B4.

Table 2: Hay Point Catchment Operational Mines

Mine Name	Owner	Status	Mine Type	Hay Point Exports YEJ 2014 (Mtpa)
Foxleigh	Anglo American	operating	surface	2.9
Capcoal (Oak Park/East)	Anglo American	closed	surface	0
Capcoal (Aquila, Bundoora)	Anglo American	suspended	underground	0 (3.9 capacity)
Capcoal U/G (Grasstree)	Anglo American	operating	underground	4.6
Grosvenor	Anglo American	Starting up	underground	0 (4.5 capacity)
Capcoal O/C (Lake Lindsay)	Anglo American	operating	surface	6.8
Moranbah Nth	Anglo American	operating	underground	4.8
Broadmeadow (Goonyella)	BMA	operating	underground	2.5
Caval Ridge	BMA	operating	surface	6.1
Daunia	BMA	operating	surface	4.7
Goonyella/Riverside	BMA	operating	surface	14.7
Peak Downs	BMA	operating	surface	9.8
Saraji	BMA	operating	surface	9.0
Norwich Park	BMA	Suspended	surface	0 (2.2 capacity)
Poitrel/Winchester	BMC	operating	surface	3.8
South Walker Creek	BMC	operating	surface	6.6
Clermont	Glencore	operating	surface	4.8
Oaky Creek (No1 & Nth)	Glencore	operating	underground	7.3
Lake Vermont	Jellinbah	operating	surface	7.5
Burton	Peabody	operating	surface	1.7
Coppabella	Peabody	operating	surface	2.9
Eaglefield	Peabody	Closed 2015	surface	2.7
Middlemount	Peabody	operating	surface	3.6
Moorvale O/C	Peabody	operating	surface	2.2
Millennium	Peabody	operating	surface	3.5
North Goonyella	Peabody	operating	underground	0.9
Hail Creek	Rio Tinto	operating	surface	8.8
Blair Athol	Rio Tinto	closed	surface	0
Carborough Downs	Vale	operating	underground	2.2
Isaac Plains	Stanmore	Suspended	surface	2.1

*: Source (Wood Mackenzie, 2015) and (Aurizon, 2013)

Figure 2: Port Hay Point Catchment



Review of Coal Market

RMI agrees with DBCTM's assessment that the current coal industry environment is more competitive than was the case at the 2010 DAU review. The significant drop in metallurgical and thermal coal prices since 2011 has been due to an over supplied market as demand from China has reduced and coal supply has been slow to adjust downwards from the pre 2011 boom period. Global coal supply is still adjusting to the weaker demand, however, Australian mines, including those in the DBCT catchment area have generally been successful in reducing operating costs to remain viable. The recent weakening of the Australian dollar has helped in this regard.

Metallurgical Coal

The DBCT handles mainly metallurgical coal, and is more exposed to the state of the metallurgical coal market, than the thermal coal market.

RMI agrees with Wood Mackenzie's assessment that world demand for metallurgical coals (hard coking, soft coking and PCI) will persist and grow over their forecast period to 2035, but that demand will be subdued over the next few years to 2018. It is possible that Wood Mackenzie may have underestimated the metallurgical coal import demand from SE Asian countries, including Vietnam, Philippines and Thailand. RMI considers that the fundamentals of long term demand for steel in China, and growing steel demand in India and SE Asian developing countries, who don't have their own sources of metallurgical coal, suggests that the demand for metallurgical coal from Australia will likely persist beyond 2035.

Australian coking coals, and particular those within the Hay Point catchment area, are well placed both geographically and from a quality and mining cost position, to supply this market.

Thermal Coal

RMI agrees with Wood Mackenzie's assessment that world demand for thermal coals is likely to also steadily increase, despite the growing world preference for cleaner energy. The fundamentals of an at least steady demand for energy in China, and a growing demand for energy in India and developing countries within SE Asia, and the continuing cost competitiveness of coal against other sources of energy, support this forecast.

However, the IEA are forecasting a growing move away from traditional use of coal for energy, with only 10% of new energy growth expected to be met by coal to 2040 (IEA, 2015). Most coal demand is expected to come from the Asian region, with, however, a growing trend for use of high efficiency, low carbon emission coal fired power generation technologies that require better quality thermal coals. This trend will favour Australian and particularly Bowen Basin mines.

It is concluded therefore, that there is sufficient long term uncertainty in the thermal coal market to cast some doubt over the viability of some long term thermal coal projects within the DBCT catchment area.

Cost Competitiveness of Bowen Basin Mines

RMI agrees with Wood McKenzie's statement that "*Despite the current weak price environment, we estimate that only a small proportion of Australia's mines are at risk of closure………The lower price environment has however had a significant impact on the project developments, many of which have been delayed in the near term, however we expect many of these will be developed over the forecast period [to 2035] ….*" (Wood Mackenzie, 2015).

Wood Mackenzie's cost margin curves for export metallurgical coal production (their Figures 29 and 31) show most mines within the Hay Point catchment area to be at the more profitable end of the cost margin curves, compared to other Australian mines and the rest of the world. A similar trend is shown for export thermal coal production in their Figures 33 and 35.

RMI notes, and agrees with, Wood McKenzie's assessment that Australian coals, including Bowen Basin coals delivered through Hay Point, will continue to be well placed to supply the metallurgical and thermal seaborne coal markets, due to a combination of factors including favourable geographical proximity to the main markets, superior quality and typically competitive mining cost.

Review of DBCT WAML Methodology – 2015 DAU

DBCT DAU Overview

The 2015 DAU argues that the current coal industry environment is higher risk than was the case at the 2010 DAU review, due mainly to the current low coal price environment, but also due to competition between export terminals for tonnage from an interconnected rail system. DBCT Management therefore has a heightened perception of the risk of reduced coal supply from within the DBCT catchment area. As a dedicated coal export terminal, with no alternative use, DBCT Management has sought to more closely link DBCT asset life, for depreciation purposes, with the life of mines it services by proposing a change in the methodology to define 'useful asset life' of the DBCT Regulatory Asset Base (RAB).

The new methodology is based on a weighted average of mine life with the DBCT catchment area. The approach assumes as for previous reviews, that the 'useful life' of many DBCT assets is a function of coal supply, such that without coal supply these DBCT assets have no commercially viable function. However, the methodology adopts a more pessimistic view of mine life prospectivity by including only new projects starting within the next 5 year regulation period, of which there are none. DBCTM argues that the reduction in 'useful asset life' takes into account a currently heightened risk of assets becoming stranded should mines close, and that "*DBCTM's risk profile is inextricably linked to it's customer base…*".

RMI agrees with the DBCTM assertion that 'useful asset life' should consider the likely life of mines that will deliver coal, particularly given the current downturn in the coal industry. RMI also agrees that the economic viability of coal supply can reduce or improve over time, due to a variety of global economic factors. However, we disagree with the assumption that the economic viability of new projects should only be considered over the next 5 year regulation period, as is the case in the Wood Mackenzie analysis (Wood Mackenzie, 2015). Mine and project viability should be considered over the entire physical life of the DBCT RAB.

DBCTM's proposed economic asset life of 25 years, which is based on a Wood Mackenzie analysis of coal resources available from only operating mines within the DBCT catchment area (Wood Mackenzie, 2015), is considered to significantly underestimate the likely long term supply of coal from the DBCT catchment area. The reasons for this conclusion are discussed in more detail in later sections.

Previous Methodology

In the 2005 DAU, 'useful asset life' (economic life) for depreciation purposes was determined by the QCA as a maximum of 50 years, being the considered economic life of the DBCT at that time. This maximum was based on analyses of DBCT catchment area mine life undertaken by Barlow Jonker for DBCT Management (Barlow Jonker, 2004) and by Energy Economics for QCA (Energy Economics, 2005) as part of the 2005/2006 review.

These studies used a similar approach, which involved compilation of Measured and Indicated coal resources and mineable (ROM) reserves inventories for mines and projects occurring within the DBCT catchment area, as a basis for determining "indicative saleable reserves" and therefore the likely life of coal supply. The methodology used is summarised in Table 3.

Table 3: Previous Method of Estimating Marketable Reserves

Mine/Project (BMA and non-BMA)	Open cut Resources		Underground Resources	
	Measured	Indicated	Measured	Indicated
Indicative conversion to Measured Resource	100%	80%	100%	80%
Indicative conversion to Mineable Reserve (recovery/dilution)	80%	80%	60%	60%
Indicative conversion to marketable reserve (yield)	80%	80%	62%	62%
Estimated Asset Life	Total marketable reserve / Port capacity (HPCT and DBCT)			

The methodology was intended to provide a broad brush estimate of the likely minimum period of coal supply to the port, and is not, and was not intended to be an estimate of 'marketable reserves' in the strict JORC sense (refer Appendix A). The latter would require detailed mining pre-feasibility or feasibility studies, and since this level of information is typically only available for the area of Measured and Indicated resources immediately ahead of mining, we consider the methodology to be appropriate. The terms Measured resource and Indicated resource are defined in Appendix A.

Mining recovery and processing yields will vary significantly from mine to mine and from seam to seam, but the factors used as shown in Table 3 are considered fit for purpose. There is in fact some healthy conservatism inherent in the estimates, as for example open cut and longwall recoveries greater than 80% and 60% respectively are being achieved, and coal loading terminals do not run at 100% efficiency.

A significant difference between the two studies was that Barlow Jonker did not account for Inferred resources, which are defined with less confidence than Measured and Indicated resources (refer Appendix A), stating that "*The return of capital from the DBCT assets should not be contingent on the discovery of resources which are currently unknown* [poorly known] *or are currently not economically viable, as this would require investors in the DBCT infrastructure assets to assume exploration and/or resource development risk*". Energy Economics agreed with this assertion, but considered that the inferred resources, coupled with the considerable exploration activity evident at the time of the review, indicated significant upside potential.

WAML Methodology

The proposed WAML methodology, in contrast uses only "reserves", including marketable reserves determined for each operating mine or project in the Wood Mackenzie Coal Supply Service (WMCSS) market analysis model in Scenario 2 below, and published "Company Reserves" in Scenario 3 (Wood

Mackenzie, 2015). The life of individual mines operating within the next 5 year regulation period appears to have been determined as either:

- Mine life = marketable reserves divided by marketable production from the WMCSS; or
- Implied mine life = Company reserves divided by WMCSS marketable production.

Four scenarios were considered:

1. Average mine life **weighted by average marketable production** over the next 5 years, with the latter as determined from the WMCSS;
2. Average mine life **weighted by marketable reserves**, with the latter as determined from the WMCSS;
3. Average implied mine life (ie “2014 Company reserves” divided by WMCSS marketable production for next 5 years) **weighted by WMCSS marketable production** for next 5 years from scenario 1; and
4. Average implied mine life **weighted by 2014 Company reserves**, as reported in Company annual reports or web sites.

There is minimal explanation of the methodologies in the Wood McKenzie report, particularly with regard to how marketable production and marketable reserves in scenario 1 & 2, are determined within the WMCSS model, and the assumptions used therein.

RMI is generally in agreement with the number of operating mines used in the WAML analysis, but we have the following concerns with the methodology assumptions and/or application:

- It is assumed that a weighted average mine life represents effective supply life to the port. In reality mines with the longest life span can provide a supply of coal well past the weighted average. Therefore the methodology disregards a significant ‘tail tonnage’ throughput, which may be sufficient to sustain DBCT function. This issue applies also to the methodology used in the 2005/2006 DAU review, described in the previous section. A more critical methodology may schedule coal supply on a year by year basis, with progressive throughput cut offs representing minimum tonnage requirements for acceptable port function (refer section **Approach 2 Methodology**). This issue applies to all four scenarios;
- The weighted average calculations include BMA coal, which is being delivered mostly to the Hay Point Coal Terminal. The resulting average is therefore not representative of coal supply only to the DBCT. The consequent weighted average is positively skewed and greater than it would be if only DBCT mines and the small component of BMA/BMC coal exported via DBCT were used. This is particularly so because most of the BMA controlled mines have more reserves and the longest life. This issue applies to all four scenarios;
- There is some confusion between marketable reserves (ie saleable product after accounting for yield from washing or processing) and mineable reserves (ie run-of-mine (ROM) production before processing). A comparison with published data shows that the “Company Reserve” figures used in scenarios 3 and 4 are actually ROM reserves. The main issue with this is the calculation of implied mine life from ***ROM reserves / marketable production***, which will result in a longer life than if the correct formula ***marketable reserves / marketable production*** were used. This issue applies to scenarios 3 & 4, and may explain why the scenario 4 weighted average mine life of 35 is significantly longer than the others;
- A small number of the WMCSS “marketable reserve” values used in scenarios 1 and 2 are also ROM reserves;

- For all four scenarios, the use of reserve tonnages only, significantly underestimates the likely supply of coal to port, as it disregards Measured and Indicated coal resources that are exclusive of reserves. The reader is referred to Appendix A, which defines this JORC terminology. There are two reasons for this:
    - The considerable expenditure required for mining feasibility and processing studies that support estimation of 'marketable reserves' ahead of mining is typically delayed by mine management until it is absolutely needed. There is therefore often a significant Measured or Indicated resource outside of the current mine design limit, which with further expenditure will eventually be upgraded to reserves;
    - JORC Measured and Indicated resources are defined with sufficient accuracy and confidence to be included in the analysis of economic life of DBCT assets, after adjustments to estimate the likely saleable component. This is in fact allowable under the JORC code 2012 (refer Appendix A), which is widely considered to be conservative. Adjustment to estimate reserves should use locally relevant mining recovery and yield from mining feasibility assessment where possible;
    - Measured and Indicated resources are typically used in the coal industry for life of mine planning and valuation purposes, at an acceptable level of risk.
- As previously discussed, RMI disagrees with the assumption that only the next 5 year regulation period should be considered. While this has practical merit when considering likely production rates, it has meant that all potential projects have been excluded from the analysis as being too speculative. There are two reasons to include viable projects:
    - The objective should be to forecast coal supply to the DBCT over the full potential life of it's regulated assets. Projects which are likely to start up beyond the next 5 year regulation period must therefore be considered; and
    - Although most projects are currently on hold in the currently depressed coal market, Wood Mackenzie's own assessment of the likely positive demand for particularly Queensland metallurgical coal to 2035, and their own evidence that mines within the DBCT catchment area are globally competitive from both a cost and coal quality point of view, lends confidence to the assertion that new projects within the DBCT catchment area will become viable as the market improves. We disagree that this would be too speculative for the purposes of estimating the economic life of DBCT assets.

Some of these points are illustrated in Figure 3 and Figure 4, which graph total and BMA coal supply to Hay Point terminals over the Wood Mackenzie forecast period for Scenario 2 and Scenario 4 respectively. Both graphs show a running down of coal deliveries to the port, starting from about 2021, which is coincidentally the end of the 5 year regulation period being reviewed.

The graphs also plot the Wood Mackenzie forecast export supply of Australian seaborne metallurgical coal, from values read approximately from their Figure 8 (Wood Mackenzie, 2015). A large proportion of this supply is forecast to come from Queensland, and particularly the Bowen Basin area. We note the trend of declining coal supply to the ports is opposite to the Wood Mackenzie Australian exports forecast, which suggests that the forecast supply of coal to the Hay Point terminals does not represent likely export demand for Bowen Basin coals within the DBCT catchment.

In reality the graphs merely show a depletion of currently defined JORC marketable reserves, which does not in most cases represent the available quantity of economically extractable coal for reasons given above. Furthermore the graphs show a significant 'tail' of coal supply available beyond the weighted average life of assets determination. Figure 4 uses Company marketable reserves, which are ROM reserves, at WMCSS marketable production rates, which has resulted in an anomalously long WAML estimate.

Therefore for a number of reasons, we consider that none of the WAML estimates are appropriate for determination of the economic life of DBCT assets, including the preferred WAML estimate of 25 years average mine life used in the 2015 DAU.

Figure 3: WAML Scenario 2 Delivery Forecast

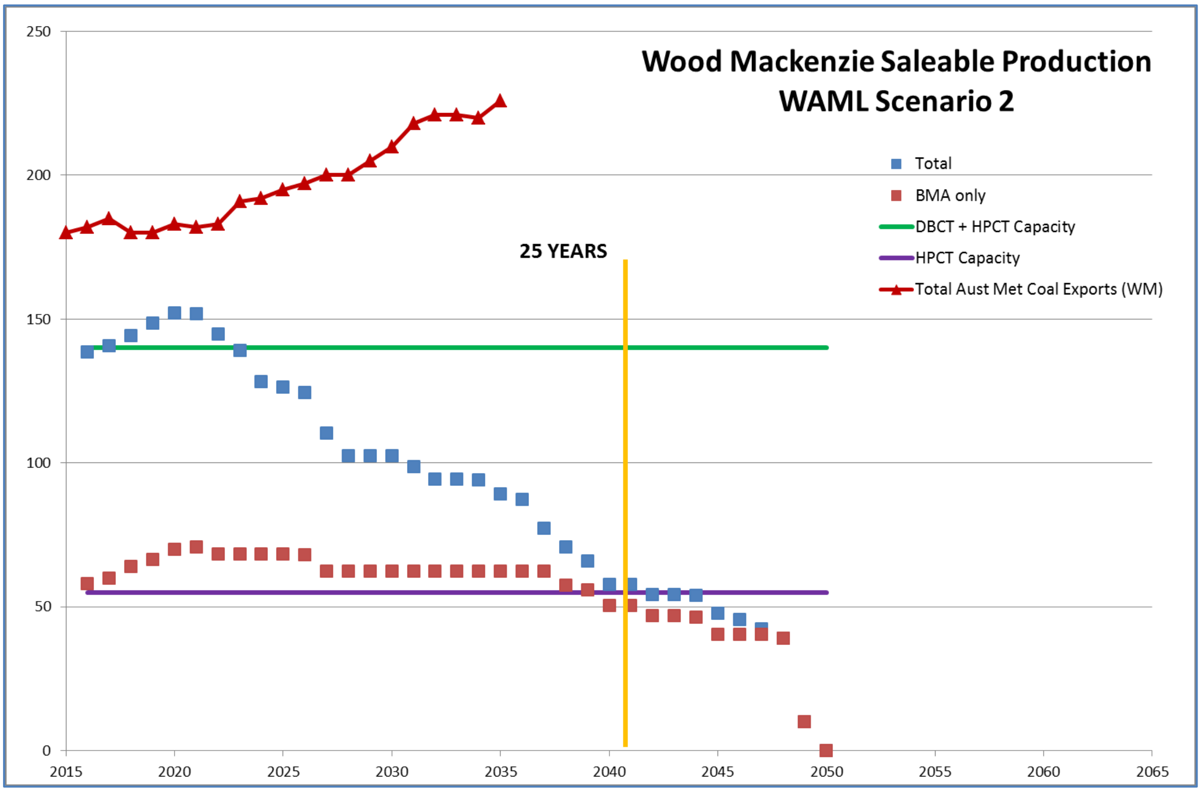
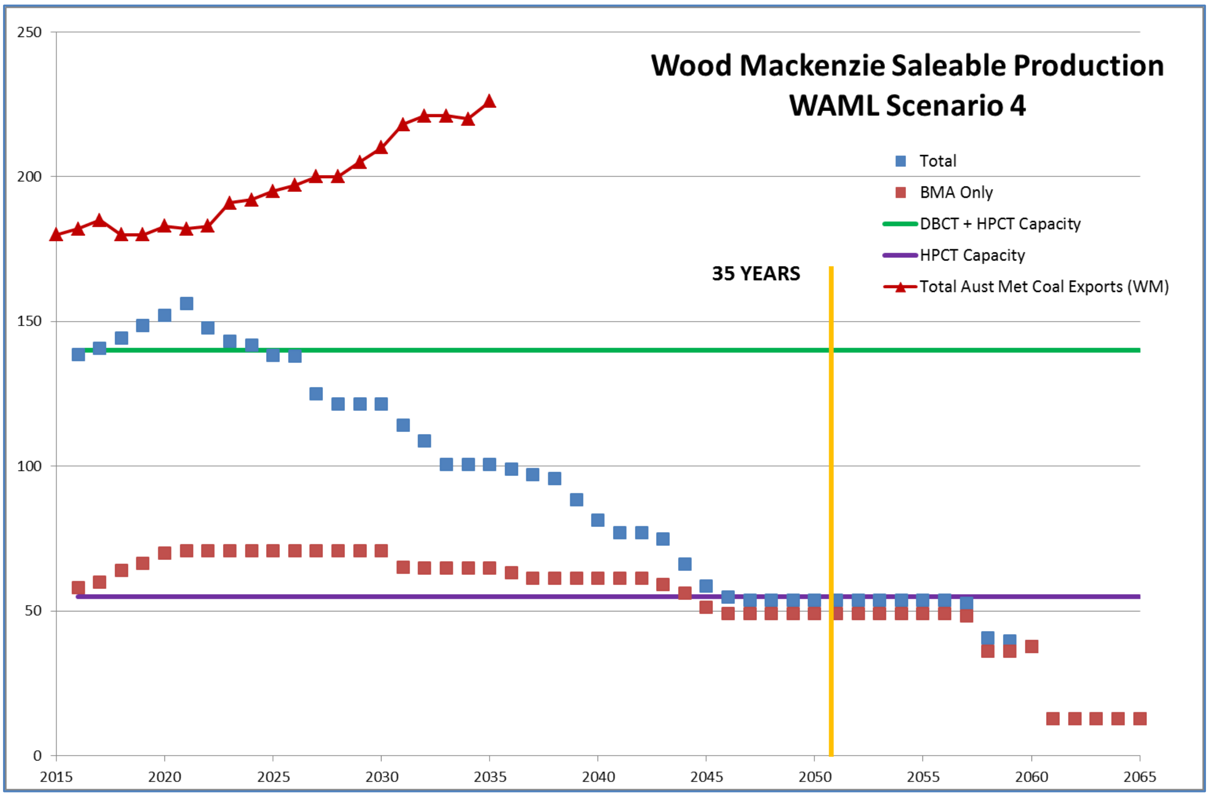


Figure 4: WAML Scenario 4 Delivery Forecast



Review of Economic Life of DBCT Assets

Alternative Approaches

It is agreed that a determination of DBCT asset life needs to account for DBCT catchment mine life, but it is recommended that the determination needs to address the following WAML methodology issues:

- Exclusion of JORC Measured and Indicated resources
- Exclusion of mining projects that, given the current forecast for positive medium to long term growth in metallurgical coal market, are likely to become viable;
- Inclusion of BMA/BMC production that will be mostly exported through HPCT; and
- Exclusion of the coal supply tail that could sustain port function if and when coal supply is approaching exhaustion.

Proposed alternative approaches include:

1. A similar methodology to that used in the 2005 DAU review, where economic life is determined by dividing reasonable estimates of "marketable reserves" available within the catchment area, by DBCT capacity. This method addresses the first three dot point issues identified above, and assumes that there is constant throughput at or near 100% port capacity. The method needs to take account of coal supply from BMA/BMC controlled mines, which is surplus to HPCT capacity as detailed below;
2. Scheduling of likely HPCT and DBCT supply at production rates for existing mines and new projects that are realistic in the context of likely global demand for Bowen Basin coals. This approach enables consideration of periods where export demand and/or coal supply are below (or above) port capacity, and would provide a basis for determining an acceptable minimum level of coal supply to sustain DBCT function. This methodology addresses the last dot point issue identified above.

Given the Wood Mackenzie current forecast for weak and then positive growth in demand for Australian, and especially Bowen Basin, metallurgical coals to 2030, RMI favours the more simplistic first approach.

Both approaches rely on up to date coal resource information and the nature and viability of potential new projects. There is now no single publically available compilation of coal resource estimates, such as the Queensland Coals publication that was used in the 2005 DAU review (DNRM, 2003). Many of the 2003 resource estimates have since been updated. We have compiled a database of mine and project information for the DBCT catchment area from company Annual reports, ASX announcements and web sites, which includes:

- JORC resource estimates and relevant geological information where available;
- Past and proposed production and coal processing rates for operating mines; and
- The nature and status of potential projects.

Approach 1 Methodology

Where: Economic life = [DBCT catchment indicative marketable reserves] / [DBCT capacity]

Indicative Marketable Reserves

Indicative marketable reserves have been estimated individually for each operating mine and potential project, including those controlled by BMA or BMC, using the following formula:

Indicative Marketable Reserve = JORC Marketable Reserve + Additional Marketable Reserve;

Where:

*JORC Marketable Reserve = JORC ROM reserve * yield; and*
*Additional Marketable Reserve = Total Measured + Indicated JORC resource * mining recovery * yield.*

Average yields were estimated for each mine or project based on available data or adjacent projects of similar geology. An assumed yield of 65% was used where such information was not available;

In the absence of mine or project specific information, the following mining recovery factors were used to derive ROM reserves from resources

- *Underground primarily longwall operations (most): 65% recovery*
- *Other underground operations (Carborough Downs): 60% recovery*
- *Surface mining operation: 85% recovery.*

We note that the mining recovery factors used are conservative, given improvements in longwall methods over the last decade, including top coal caving methods. Opencut recovery should also have improved, and should be closer to 90%.

JORC Indicated resource estimates were **not** reduced by a factor of 0.8, as was done in the 2005 DAU review to account for the risk of conversion to all measured resources, as ROM and marketable Probable Reserves definition include Indicated resources.

DBCT Throughput and Terminal Capacity

For the calculation, it is assumed that DBCT capacity will remain at 85Mtpa, and HPCT port capacity will remain at 55Mtpa for the forecast period. It is assumed that HPCT will run at 100% capacity. It is also assumed that 100% of non BMA/BMC mines and projects will be available for supply to DBCT. This may not be the case, but it is beyond the scope of this report to predict otherwise.

BMA and BMC mines mainly use the HPCT, but have contracted capacity at the DBCT, RG Tanner and Abbot Point coal terminals (BHP Billiton, 2015). Wood Mackenzie notes that Poitrel and South Walker Creek mines export via DBCT, and they predict that total BMA+BMC production within the DBCT catchment area will increase from 49Mtpa in 2016 to 61.2Mtpa in 2021 (Wood Mackenzie, 2015). This leaves at least 6.2Mtpa surplus to the 55Mtpa capacity at HPCT, of which some may be railed to the RG Tanner or Abbot Point coal terminals.

The 2005 review noted the BMA/BMC contracted allocation at DBCT was at least 3Mtpa, and was assumed to be 5Mtpa (Energy Economics, 2005). We have retained the assumption of 5Mtpa BMA/BMC supply to DBCT over the full forecast period to 2054. The calculation of DBCT economic life accounts for the BMA/BMC throughput by reducing DBCT capacity in the calculation from 85Mtpa to 80Mtpa.

Viable Projects

Indicative marketable reserve estimates have been determined for projects as well as operational mines. There exists a very long list of potential projects at various stages of project feasibility assessment from early exploration to the EIS approvals stage. Very few, if any of these projects are viable in the current low coal price environment, but the Wood Mackenzie forecast for positive medium to long term growth in metallurgical coal exports lends confidence to eventual project development to at least replace existing mines that exhausted their resources.

We have assessed the likelihood or risk of projects going ahead over the potential life of the DBCT assets, rather than the next 5 year DAU period. Projects have been included or excluded from the Method 1 analysis, based on the following project ranking:

1. Ease of development: Projects have been classified initially as either:
   - Brownfields projects, which are advantaged by having existing mine infrastructure available. These have been assigned a B ranking; or
   - Greenfields projects, which are disadvantaged by having no existing mine infrastructure. Road, rail and community infrastructure are usually readily available within the DBCT catchment area. These projects have been assigned a G ranking.
2. Stage of project development: Projects have then been ranked as follows:
   - 1 = projects with mining feasibility or pre-feasibility investigations underway or completed and JORC reserves have been announced;
   - 2 = projects in the mine planning stage or advanced exploration stage, where there are significant Measured and Indicated JORC resources reported and possibly a conceptual mine plan; and
   - 3 = projects in the early exploration stage, with insignificant Measured and Indicated JORC resources reported.

All B3 and G3 projects have been excluded from the method 1 analysis, but a list of all known projects has been compiled separately as an indication of further potential. JORC Inferred resource estimates have also been excluded from the method 1 calculations.

Approach 2 Methodology

Another approach is to schedule production over the life of each mine or project, utilising the indicative marketable reserves as determined in the previous section, and using the following mine or project specific production rates:

- production rates as reported by Wood Mackenzie from their WMCSS model for currently operating mines (Wood Mackenzie, 2015);
- target production rates as reported by Companies in IAS or EIS documentation for advanced projects, which are based on mining feasibility studies; and
- assumed target production rates for other projects, based on the proposed mining method and nature and size of the resource.

In applying this methodology, it has been assumed that total production from existing and new DBCT mines, plus 5Mtpa from BMA/BMC mines, will not exceed the current DBCT port capacity of 85Mtpa. Given the Wood Mackenzie current forecast for weak and then positive **growth** in demand for Australian and especially Bowen Basin metallurgical coals to 2030, it is also assumed that total production will not reduce substantially below DBCT capacity.

It has also been assumed that as existing mines, such as Hail Creek, exhaust their indicative marketable reserves, new projects are immediately available to replace the lost tonnage.

Marketable Reserves and Economic Life of DBCT Assets

The Appendix B1 table summarises indicative marketable reserves and mine assumptions for all currently producing mines within the Port Hay Point catchment area. Appendix B2 similarly summarises indicative marketable reserves and project assumptions for existing mines that are expected to resume production (rank B1), as well as advanced brownfields projects (rank B2) and advanced greenfields projects (rank B1). These projects are considered to have a strong likelihood of supplying coal to Hay Point terminals in the medium to long term given the Wood Mackenzie positive forecast for metallurgical coal demand.

Using method 1, there are sufficient indicated marketable reserves from **existing operations only** to potentially supply coal to DBCT for at least 20 years from 2014 (Table 4), including an assumed 5Mtpa from BMA/BMC controlled mines. There are sufficient indicative marketable reserves from **existing operations and advanced projects** (Appendix B2) to potentially supply coal to DBCT for at least 32 years from 2014 (Table 4), including an assumed 5Mtpa from BMA/BMC controlled mines.

It is worth noting at this point that additional marketable reserves are likely to be found at the end of a mines life to fully utilise infrastructure expenditure. For example additional reserves can include highwall mining from an existing open cut face, when the opencut has reached an economic limit. This is relatively low cost mining, which utilises existing mine infrastructure and may significantly extend reserves. Although this provides some reserve upside, we consider that it is more prudent to use only currently defined indicative marketable reserves

Table 4: Summary of Economic Life Estimates - Method 1

	Indicative marketable reserves (Dec2014; Mt)			DBCT Estimated Supply Life (years from end 2014)	
	BMA/BMC	DBCT	Total	DBCT Capacity (Mtpa) *1	Supply Life
Operating Mines	2721.0	1700.5	4421.5	80	21
Mines plus Advanced Projects	3855.3	2602.4	7359.5	80	32
Mines and all projects	4436.6	3279.9	7716.5	80	41

*1 Assumes DBCT capacity of 85Mtpa, of which 5Mtpa is BMA/BMC tonnage.

Appendix B3 summarises indicative marketable reserves and project assumptions for greenfields projects (ranking G2) with significant Measured and Indicated JORC resources. These projects have a mining concept, but to the author's knowledge, have not advanced to the stage of mining feasibility assessment and have not reported JORC reserves.

Most of these projects are considered to have a reasonable probability of being developed in the long term given the positive forecast for metallurgical coal demand. However, due to the currently uncertain long term outlook for thermal coal, we have for the sake of prudency excluded the Valeria and Moorlands projects from consideration.

Using method 1, there are sufficient indicated marketable reserves from viable G2 greenfields projects, **which involve significant coking coal production,** to potentially supply coal to DBCT for at least a further 9 years. This brings DBCT coal supply life from all operating mines and all viable projects to at least 41 years from 2014 (Table 4).

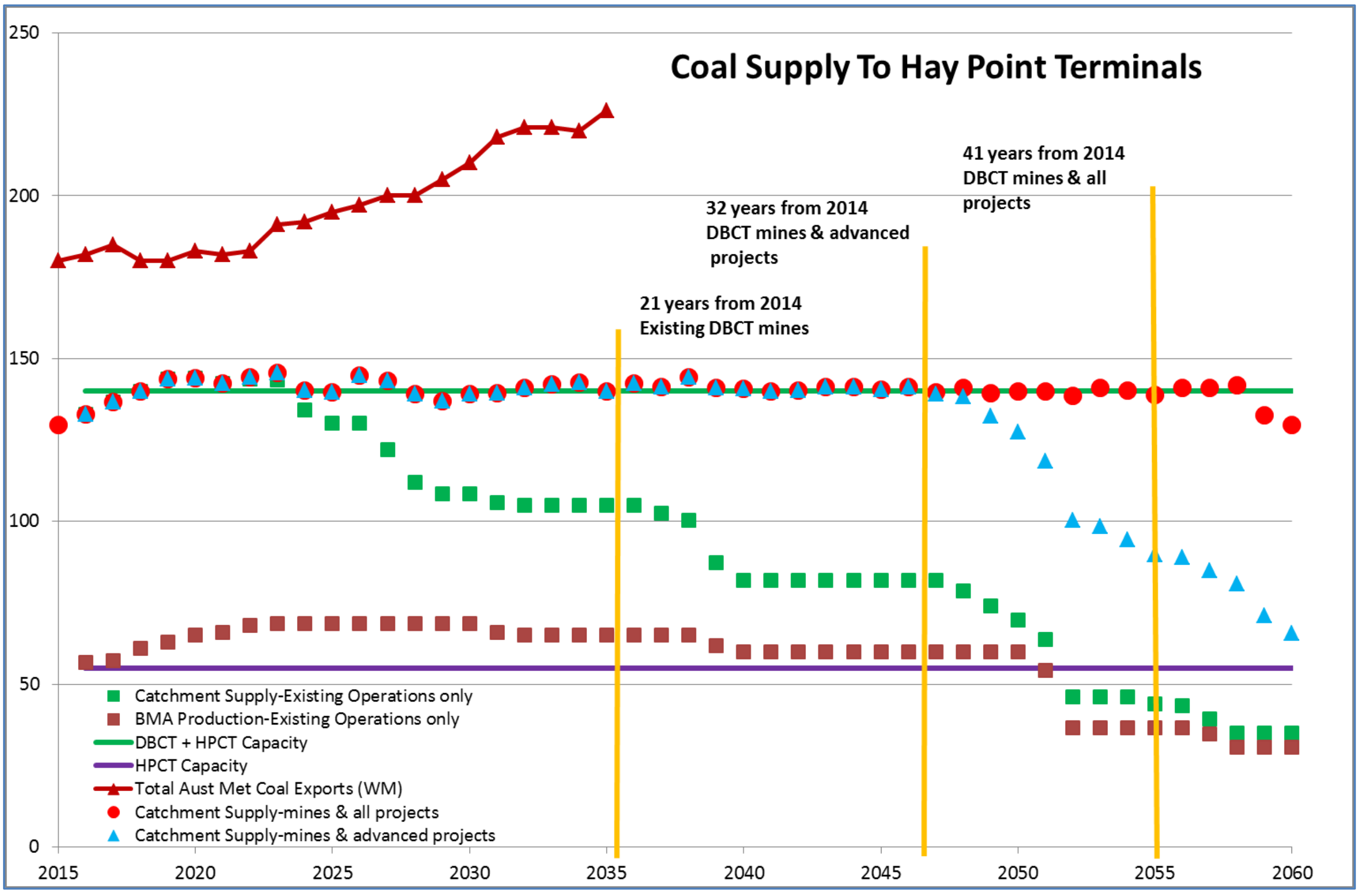
The estimated economic life of DBCT assets using the proposed Approach 1 methodology is therefore 40 years from 2015.

DBCT Coal Supply Forecast

The supply of coal from the catchment area will decline at different rates, depending on the timing of mine closures and availability of new projects to replace them. The tail of coal supply may extend well beyond the method 1 supply life estimate. The rate of decline below a crucial minimum economic DBCT throughput, and the time at which the minimum is reached, may be of interest for determining the 'useful life' of DBCT assets for depreciation purposes.

Such production forecasting is complex and beyond the scope of this report, however, to illustrate the point, Figure 5 plots a scenario of total catchment supply to the Hay Point terminals following the approach 2 methodology described above. The graph confirms the conclusion that there are more than sufficient indicative marketable coal reserves within the DBCT catchment area to sustain DBCT at capacity throughput to the end of current lease in 2051 and beyond. This assumes the current positive Wood Mackenzie market forecast.

Figure 5: Revised Coal Supply to Hay Point Terminals



The vertical lines drawn in Figure 5 identify DBCT mine life from 2014 for existing mines only (21 years), DBCT mines and advanced projects (32 years), and DBCT mines and all projects (41 years). We note that the position of these lines represent the life of mines and projects supplying coal only to the DBCT, which cannot be compared directly with the catchment supply plots that include also BMA/BMC mines/projects that will supply coal mostly to HPCT.

It is recommended that this scheduling approach may be useful in the future to better identify the time at which coal supply may drop below economically sustainable levels.

Differences to 2015 DAU WAML Estimates

In summary, the differences between weighted average mine life determined by Wood Mackenzie for the 2015 DAU (Wood Mackenzie, 2015), which range from 20 to 36 years for existing mines only, and that determined in this review (21 years) for existing mines only, are due to:

- their inclusion of BMA production, which will result in a WAML overestimation;
- their exclusion of additional Measured and Indicated resources from the analysis, which will result in a WAML underestimation; and
- Their use of ROM Company reserves in the calculation of implied mine life (ie Implied mine life = ROM Company reserves / marketable production), which will result in a WAML overestimation.
- The net effect of these differences is an overestimate for only operational mines.

However, the difference between our recommended DBCT mine life estimate of 40 years from 2015 and DBCTM's preferred WAML estimate in the 2015 DAU of 25 years, is due to:

- Our inclusion of marketable reserves estimated from additional Measured and Indicated resources;
- Our inclusion of new projects, which are considered to have a reasonable certainty of eventual development over the potential life of DBCT assets, particularly given the current positive Wood Mackenzie market forecast and the competitiveness of DBCT catchment area mines;
- The net effect of these differences is the 2015 DAU preferred estimate of 25 years significantly **underestimates** DBCT mine life and therefore the economic life of DBCT assets.

Appendices

Appendix A: JORC Terminology

The Australian code for reporting of exploration results, mineral resources and ore reserves has recently been updated to the 2012 edition. Known as the Joint Ore Reserves Committee (JORC) Code, it is recognised as the basis for discussion of coal resources and reserves in Australia and worldwide. Terminology is strictly defined, due to the economic importance of resource and reserve estimates. The following terms have been used in this report.

Mineral Resource: A mineral (coal) resource is a concentration or occurrence of solid material of economic interest, in such form, quality and quantity that there are reasonable prospects for eventual economic extraction. The location, quantity, quality, continuity and other geological characteristics of the resource are known, estimated or interpreted from geological evidence, including sampling. Mineral resources are classified and sub-divided in order of increasing geological confidence, into **Inferred**, **Indicated** and **Measures resources**

Measured resource: A Measured resource is that part of a mineral resource for which quantity, quality, densities, shape and physical characteristics are estimated with confidence sufficient to allow the application of **modifying factors** to support detailed mine planning and final evaluation of the **economic viability** of the resource. A Measured resource has been defined with a higher level of confidence than An Indicated resource, and may be converted to a **Proved Ore Reserve**.

Indicated resource: An Indicated resource is that part of a mineral resource for which quantity, quality, densities, shape and physical characteristics are estimated with confidence sufficient to allow the application of **modifying factors** to support detailed mine planning and final evaluation of the **economic viability** of the resource. An Indicated resource has been defined with a lower level of confidence than a Measured resource, and may only be converted to a **Probable Ore Reserve**.

Inferred resource: An Inferred resource is that part of a mineral resource for which quantity and quality are estimated from limited geological evidence and sampling. The geological evidence is sufficient to imply but not verify geological and grade continuity. An Inferred resource has been defined with a lower level of confidence than an Indicated resource, and **may not be converted to an Ore Reserve.** However, there is a sufficient level of confidence to expect that an Inferred resource could be upgraded to an Indicated resource with continued exploration.

Ore Reserve: Ore Reserves are those portions of mineral resources that are economically mineable, which after the application of all material Modifying Factors result in an estimated tonnage and quality that can be the basis of a technically and economically viable mining project. Determination of **Modifying Factors** require Pre-Feasibility or Feasibility level studies to be undertaken to achieve the required level of confidence, which must include a mine plan or mine design.

Modifying factors: Modifying factors are adjustments required to a Measured and/or Indicated mineral resource estimate, which take account of dilution (contamination) and losses during mining, and yield, sizing and quality changes during processing. Modifying factors are determined from detailed Pre-feasibility and/or Feasibility level studies.

Mineable Reserves: Mineable reserves are reported at the point of delivery to the processing plant, and include dilution and mining loss modifying factors to Measured and Indicated resources.

Marketabe Reserves: Marketable (saleable) reserves are reported at the point of product delivery, after ore/coal processing, and include tonnage and quality adjustments from ROM reserves due to processing and yield modifying factors.

Appendix B1: Indicative Marketable Reserves for Currently Operational Mines

Mine or Project	Primary Owner	Ranking	Mining method	Mining Recovery	Yield	JORC ROM Reserve 2014	Additional JORC Resource 2014 *1	"Indicative 2014 Marketable Reserve" *2
Foxleigh All	Anglo American	Operating	surface	85%	71%	19.8	2.7	15.7
Capcoal Grasstree	Anglo American	Operating	longwall	65%	73%	43.5	75	67.2
Grosvenor	Anglo American	Operating	longwall	65%	67%	192.9	190.1	211.0
Capcoal OC	Anglo American	Operating	surface	85%	71%	135.9	72	139.4
Moranbah Nth	Anglo American	Operating	longwall	65%	73%	129.3	72	129.3
Broadmeadow	BMA	Operating	longwall	65%	71%	Included with Goonyella/Riverside		
Caval Ridge	BMA	Operating	surface	85%	0%	Included with Peak Downs		
Daunia	BMA	Operating	surface	85%	81%	138	13	121.0
Goonyella/Riverside	BMA	Operating	Surface/ longwall	80%	74%	748	764	926.4
Peak Downs	BMA	Operating	surface	85%	59%	1040	432	829.4
Saraji	BMA	Operating	surface	85%	61%	539	393	529.7
Poitrel	BMC	Operating	surface	85%	68%	72	15	57.7
South Walker Creek	BMC	Operating	surface	85%	73%	89	309	256.8
Oaky Creek (No1 & Nth)	Glencore	Operating	longwall	65%	91%	130	170	218.3
Clermont	Glencore	Operating	surface	85%	100%	145	10	153.5
Lake Vermont	Jellimbah	Operating	surface	85%	80%	219.97	160.03	284.8
Burton	Peabody	Operating	surface	85%	75%	9.07	0	6.8
Coppabella	Peabody	Operating	surface	85%	80%	61.7	119.6	130.7
Middlemount	Peabody	Operating	surface	85%	75%	84	36.6	86.9
Moorvale O/C	Peabody	Operating	surface	85%	77%	19.96	13.74	24.4
Millenium	Peabody	Operating	surface	85%	70%	41.73	28.27	45.8
North Goonyella	Peabody	Operating	longwall	65%	80%	88	0	70.4
Hail Creek	Rio Tinto	Operating	surface	85%	67%	127	27.8	100.8
Carborough Downs	Vale	Operating	underground	60%	66%	23.7	0	15.7
						Total BMA/BMC mines		**2721.0**
						Total DBCT mines		**1700.5**

*1 Includes Measured and Indicated resources only, exclusive of reserves

*2 Determined from (JORC ROM reserve*yield) + (JORC M+I resource x mining recovery x yield)

Appendix B2: Indicative Marketable Reserves for Advanced Projects

Mine or Project	Primary Owner	Ranking	Mining method	Mining Recovery	Yield	JORC ROM Reserve 2014	Additional JORC Resource 2014 *1	"Indicative Marketable Reserve" 2014 *2
Norwich park	BMA	B1	surface	85%	71%	230	119.0	228.9
Capcoal -Aquila	Anglo American	B1	longwall	65%	68%	46.6	33.6	45.1
Eagle Downs	Vale	B1	longwall	65%	59%	254.1	564.9	344.6
Isaac Plains/Wotonga	Stanmore	B1	surface	85%	74%	5	14.1	11.7
Lenton	New Hope	G1	surface	85%	50%	52	165.0	89.1
Moorvale U/G	Peabody	B1	longwall	65%	77%	15.2	54.8	36.4
Codrilla	Peabody	G1	surface	85%	80%	50	5.5	43.4
Olive Downs Nth	Peabody	B1	surface	85%	77%	11.6	54.3	40.9
Hail Creek U/G	Rio Tinto	B2	longwall	65%	67%	52	111.2	78.3
Lake Elphinstone	Rio Tinto	B2	surface	85%	67%	0	120.0	61.5
Moorvale West	Peabody	B2	longwall	65%	77%	0	131.9	59.4
Red Hill	BMA	G1	longwall	65%	72%	0	649.0	273.4
Red Hill O/C	BMA	G1	surface	85%	65%	0	25.0	12.4
Peak Downs/East	BMA	B2	longwall	65%	59%	0	719.0	248.2
Saraji East	BMA	B2	surface	85%	61%	0	688.0	321.1
South Walker Creek U/G	BMC	B2	longwall	60%	73%	0	128.0	50.5
Teviot Brook	Anglo American	B2	longwall	65%	73%	0	167.9	72.1
Broughton	U&D Mining	G1	surface	85%	67%	28.9	0.0	19.3
						Total BMA/BMC advanced projects		1134.4
						Total DBCT advanced projects		901.8

*1 Includes Measured and Indicated resources only, exclusive of reserves

*2 Determined from (JORC ROM reserve*yield) + (JORC M+I resource x mining recovery x yield)

Appendix B3: Indicative Marketable Reserves for Other Potentially Viable Projects

Mine or Project	Primary Owner	Ranking	Mining method	Mining Recovery	Yield	JORC ROM Reserve 2014	Additional JORC Resource 2014 *1	"Indicative Marketable Reserve" 2014 *2
Vermont East/Willunga	Peabody	G2	surface	85%	77%	0	293.6	172.9
Dysart East	Bengal Coal	G2	underground	65%	65%	"37" *3	0.0	24.1
Moranbah Sth	Anglo American	G2	underground	65%	77%	0	704.4	317.3
Wards Well	BMA	G2	underground	65%	65%	0	1224.0	465.4
Bee Ck	BMA	G2	surface	85%	65%	0	55.0	27.3
Nebo West	BMC	G2	surface	85%	65%	0	178.0	88.5
Olive Downs Sth	Peabody	G2	surface	85%	77%	0	43.8	25.8
Rugby	Qcoal Pty	G2	underground	65%	65%	0	180.0	68.4
Talwood	Vale	G2	underground	65%	64%	0	185.5	69.0
						Total BMA/BMC projects		581.3
						Total DBCT Other projects		677.6

*1 Includes Measured and Indicated resources only, exclusive of reserves

*2 Determined from (JORC ROM reserve*yield) + (JORC M+I resource x mining recovery x yield)

*3 Bengal Coal web site states "37Mt ROM reserves", but does not advise JORC status.

Appendix B4: Other Known Projects Not Included

Mine or Project	Primary Owner	Mining method	Ranking
Valeria	Rio Tinto	Surface	G2
Moorlands	Cuesta Coal	Surface	G2
Broadlea	Vale	surface	B3
Lake Vermont U/G	Jellinbah	underground	B3
Liskeard/Gregory	BMA	surface	B3
Millennium U/G	Peabody	underground	B3
Norwich park u/g	BMA	underground	B3
Saraji East U/G	BMA	underground	B3
Burton West/North	Peabody	underground	G3
Ellensfield	Vale	underground	G3
Harrybrandt	Yanhou	surface	G3
Hillalong	Qld Coal Exploration	surface	G3
Mount Fort Cooper	Rio Tinto	surface	G3
Rockwood	U&D Mining	surface	G3
Wilpeena	Baoshan Iron&Steel	surface	G3
Winchester South	Rio Tinto	surface	G3

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