

# Rix's Creek Continuation Project – Economic Assessment

Addendum to report prepared for  
Rix's Creek Pty. Limited

3 May 2016

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# Disclaimer and limitations

## Inherent limitations

This Addendum Report has been prepared as outlined in the Background and Scope and Purpose Sections. This Addendum Report provides further clarification regarding selected components of KPMG's Final Report *Rix's Creek Continuation Project – Economic Assessment* dated 9 July 2015 (**Final Report**). This Addendum Report does not contain KPMG's conclusive findings (which are only contained in the Final Report), and therefore this Addendum Report must be read in conjunction with the Final Report.

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# Document Purpose and Limitations

## Background and Scope

Big Ben Holdings Pty Limited (ultimate holding company of The Bloomfield Group and Rix's Creek Pty Limited), engaged KPMG in April 2014 to prepare an economic impact assessment of the Rix's Creek Continuation Project as a part of a broader EIS. Specifically, the scope of services includes:

- CBA of the Project including:
  - assessment of the direct economic benefits of the development;
  - identification of any adverse impacts of the development; and
  - detailed assessment of the costs and benefits of the development as a whole, and
  - whether it would result in a net benefit for the NSW community.
- Regional economic impact assessment to estimate the indirect economic benefits of the Project for the local (Hunter Valley region) and state (NSW) economies.

The KPMG report *Rix's Creek Continuation Project – Economic Assessment* ('the report' or 'the KPMG report') was issued on 9 July 2015. This document forms an addendum to the report.

## Purpose

This addendum report provides further information on selected components included in the KPMG report. Specifically, this addendum seeks to respond to questions and points of clarification regarding the KPMG report and should, under all circumstances, be read in conjunction with the report.

## Limitations

This addendum does not seek to re-estimate the economic implications associated with the Rix's Creek Project or replace or update the KPMG report issued on 9 July 2015. The content of this addendum does not seek to provide a comprehensive representation of the economic implications of the Rix's Creek Project. For that reason, this addendum should be read in conjunction with and refers to the KPMG report issued on 9 July 2015.

# Response to Questions and Clarifications

The following table provides further information relating to the analysis of the economic implications of Rix's Creek Extension Project. The questions and clarification relating to the report were grouped into five key areas, namely:

- coal price assumptions;
- royalties and taxes;
- net producer surplus;
- cost of mitigating environmental and social impacts; and
- labour premiums.

The complete findings of the analysis are documented in the KPMG report issued on 9 July 2015.

*Table 1: Response to questions and clarifications*

Analysis component	Description
<b>Coal price assumptions</b>	<p>The economic appraisal was undertaken as at July 2014 with all results reported in 2014 Australian dollars. The analysis relied on coal price forecasts published by the World Bank, <i>Commodity Market Outlook, July 2014</i>.<sup>1</sup> These prices were converted to real Australian dollars based on the exchange rate and the consumer price index (CPI) at the time of the analysis. The analysis assumes a long term average price of slightly below \$100 per tonne (Australian dollars).</p> <p>It is recognised that, given the long term nature of the project, there will be variation in coal prices. However, the assumed price adopted in the 2014 KPMG analysis is broadly consistent with price assumptions adopted by the NSW Department of Industry (Division of Resource and Energy "DRE") in the review of the Rix's Creek Environmental Impact Statement (dated December 2015), specifically:</p> <ul style="list-style-type: none"><li>• \$80 per tonne in the short term for export thermal coal;</li><li>• \$75 to \$100 per tonne in the medium to long term for export thermal coal;</li><li>• \$100 per tonne in the short term for export coking coal; and</li><li>• \$120 per tonne in the medium to long term for export semi soft coking coal.</li></ul> <p>In considering the impact of changes in coal prices in the short to medium term, changes in the costs of the project should also be considered. Recent consultation with Bloomfield Collieries suggests that, since the completion of the economic analysis in 2014, there have been a number of changes that have potentially reduced the costs associated with the Rix's Creek Extension Project. The changes are primarily associated with purchase of Integra Open Cut and include:</p> <ul style="list-style-type: none"><li>• Acquisition of the rail loop that is expected to result in cost savings of approximately \$4.5 million per annum. These cost savings are expected to result from savings in rail loop access charges (previously paid to the owner of the rail loop) net of expected rail loop operational expenses.</li></ul>

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<sup>1</sup> World Bank Group 2014, *Commodity Markets Outlook*, July 2014.



Analysis component	Description
	<ul style="list-style-type: none"> <li>Excess mobile mining machinery purchased through the Integra acquisition will be used to refresh the Rix's Creek fleet and provide savings in forecast mobile fleet replacement capital expenditure of approximately \$85.6 million over the first 16 years of the Rix's Creek extension.</li> <li>Excess mobile mining machinery will also realise savings on repairs and maintenance, with newer machinery replacing older and less efficient machines.</li> <li>Excess components and inventory purchased through the Integra acquisition will reduce repairs and maintenance costs by \$6.5 million over the first 2 years.</li> <li>The operation of Rix's Creek and Rix's Creek North will utilise predominantly the existing management personnel. The effect of this will be a reallocation of management salaries overheads from Rix's Creek to Rix's Creek North. This is expected to result in a saving of 30 per cent of management overheads or \$2.8 million per annum<sup>2</sup>.</li> </ul>
<b>Royalties and taxes</b>	<p>Royalties and taxes are typically excluded from an economic appraisal as they represent a transfer from one party to another. In the case of the analysis of the Rix's Creek Continuation Project, royalties and company tax represent a cost to Bloomfield Collieries and an equivalent benefit to government. Accordingly, inclusion of royalties and company tax has no net impact on the overall analysis result.</p> <p>It is noted that the inclusion of royalties and taxes impacts the distribution of costs and benefits. However, distributional impacts were not the focus of the KPMG analysis.</p> <p>There are a number of potential tax revenue streams that would be generated as a result of the Rix's Creek Continuation Project, namely:</p> <ul style="list-style-type: none"> <li>royalties;</li> <li>payroll taxes;</li> <li>income tax paid by employees associated with their wage and salary income; and</li> <li>company tax payable by Bloomfield Collieries.</li> </ul> <p>It is important to note that Bloomfield Collieries is an Australian owned entity and accordingly, profits and associated tax payments accrue within Australia.</p> <p><b>Royalties</b></p> <p>DRE have developed estimates of coal royalties based on an assumed price of A\$80 per tonne for export thermal cost. For coking coal, DRE have assumed a short term price of A\$100 and a medium to long term price of A\$120 per tonne. Based on production of 25 million tonnes per annum (Mtpa) of product coal mined from 2016 to 2038, the typical annual royalty is estimated to be \$9 million. Over the life of the Project, DRE estimated total royalties to be A\$240 million or A\$130 million in present value terms (based on a discount rate of 7 per cent) to NSW.</p>

<sup>2</sup> Based on information provided by Bloomfield Collieries.

Analysis component	Description
	<p>The DRE estimates of royalties are slightly higher than estimates if the assumed price adopted in the KPMG analysis is assumed. Specifically, the expected royalties relating to the project are estimated to be approximately \$9 million per annum or \$215 million over the life of the project (\$133 million in present value terms). These estimates are based on the current share of allowable deductions, the coal prices assumed in the KPMG analysis and the current Ad Valorem rate of 8.2 per cent.</p> <p><b>Payroll taxes</b></p> <p>Payroll tax is applied to wages that exceed the payroll tax threshold (\$750,000 in 2015-16). The current rate of payroll tax is 5.45 per cent. Over the life of the Project, average annual labour costs are estimated to be approximately \$17 million. Payroll tax associated with this would be approximately \$900,000 per annum.</p> <p>It is recognised that payroll tax income may be generated without the Project, with workers employed in another part of the entity. However, it is expected that a proportion of this tax revenue is incremental to the extent that workers earn a wage premium under the Project.</p> <p><b>Personal income tax</b></p> <p>Personal income tax is paid by individuals based on their annual taxable income. Based on the average annual labour cost (\$17 million) and an average annual labour force of 125 persons, average annual personal income tax contribution by employees of the Rix's Creek Project is estimated to be almost \$4.8 million (in 2016 dollars). The share of this tax revenue attributable to NSW can be estimated based on the state share of population (32 per cent). Accordingly, the NSW personal income tax contribution associated with the project is estimated to be approximately \$1.5 million per annum.</p> <p><b>Company tax</b></p> <p>The current company tax rate in Australia is 30 per cent. Based on the average annual revenue and costs associated with the Rix's Creek Project, the estimated company tax payable is approximately \$10 million per annum. The company tax income attributable to NSW is estimated to be just over \$3 million per annum over the life of the Project.</p>
<b>Net producer surplus</b>	<p>Net producer surplus is equivalent to the revenue from operations less the costs of the project. While not specified in the analysis as a benefit, producer surplus is effectively included in the analysis. The economic analysis considers full project revenue and full project costs associated with the Rix's Creek Continuation Project. The difference between these two analysis components, the producer surplus, forms part of the analysis results.</p>
<b>Cost of mitigating environmental and social impacts</b>	<p>The costs of mitigation activities undertaken by Bloomfield Collieries is included in the costs associated with operating the Rix's Creek Continuation Project. Specifically, these costs include:</p> <ul style="list-style-type: none"> <li>• environmental monitoring;</li> <li>• waste management;</li> <li>• rehabilitation costs;</li> <li>• licenses;</li> <li>• other environmental related activities; and</li> </ul>

Analysis component	Description
	<ul style="list-style-type: none"> <li>equipment replacement.</li> </ul>
<b>Labour Premiums</b>	<p>The report includes quantification of the economic benefit to workers associated with the Rix's Creek Continuation Project. Inclusion of this benefit is consistent with the recently finalised NSW Government <i>Guidelines for Economic Assessment of Mining and Coal Seam Gas Proposals</i> (see Table 3.1 in the guidelines).<sup>3</sup></p> <p>The rationale for inclusion of the wage premium is recognition of the economic benefits associated with continued operation of the Rix's Creek Project for the local community. Importantly, as outlined Section 3 of the report, the number of unemployed persons in the Hunter Valley region has increased significantly over the last two years and average individual taxable income is significantly lower in the region relative to the state average.</p> <p>The potential for labour premiums is increasingly compelling as some excess labour capacity emerges in the resources sector. Cessation of operations at Rix's Creek would likely result in employees seeking alternate employment. These employees may face difficulty in obtaining alternate employment at their current wage levels given the lower commodity price environment.</p> <p>Social impact analysis relating the Rix's Creek expansion assessed the areas of resilience and risk in the local community. The analysis identified that the "...lack of economic diversity in the Hunter region and dominance of mining industry employment and associated occupations..." potentially made the region "...vulnerable to changes in mining activity...".</p>
<b>External costs</b>	<p>As outlined in Table 4.1 of the report, environmental externalities are identified as a potential cost associated with the Rix's Creek Continuation Project. The report draws on various third party publications pertaining to the specific development to highlight the potential environmental externalities, including impacts on:</p> <ul style="list-style-type: none"> <li>air quality;</li> <li>ecology (vegetation);</li> <li>noise;</li> <li>soils and geology;</li> <li>surface water;</li> <li>groundwater; and</li> <li>heritage.</li> </ul> <p>The third-party environmental impact reports generally concluded that the environmental impacts were manageable and appropriate mitigation measures were established. An assessment of air quality impacts quantified the air quality impacts although noted that these would likely be ameliorated. Despite this amelioration, these air quality impacts were quantified and included in the economic costs.</p> <p>The unit price of Greenhouse Gas (GHG) emissions adopted at the time of the analysis (2014) was based on advice from the Department of Environment (Commonwealth) and was based on the Renewable Energy Target (RET)</p>

<sup>3</sup> NSW Department of Planning and Environment 2015, *Guidelines for the economic assessment of mining and coal seam gas proposals*, December.



Analysis component	Description
	Review undertaken in the months leading up to the date of the analysis. It is recognised that there is some speculation regarding an appropriate assumption for the valuation of GHG emissions and sensitivity analysis would demonstrate the impact of variation in this assumption on analysis findings. However, the total value of environmental externalities represents less than one per cent of total project costs (refer to Table 4.7), and accordingly, changes in the assumed unit price is unlikely to have a material impact on the analysis findings.
<b>Residual value of land and agriculture production</b>	<p>The residual value of land was estimated based on the total land area (185 hectares) included in the extension of Rix's Creek and an average land value of \$10,000 per hectare (as described on Page 42 of the report). The average land value assumption was adopted based on information provided by Bloomfield Collieries on recent sales of equivalent land in the area.</p> <p>The value of agriculture production foregone was estimated based on an assessment of the productive potential of the site prepared by Neil Nelson Agvice P/L. The assessment found that the site had a carrying capacity of between \$20,000 to \$30,000 per annum. If the site was managed intensively, the annual capacity may be as high as \$45,000 per annum.<sup>4</sup></p>
<b>Economic impact assessment</b>	<p>As outlined in Section 2.6 of the report, comparative static Computable General Equilibrium (CGE) modelling was used to estimate the economic impact of the proposed Rix's Creek continuation. Input-output (IO) tables published by the Australian Bureau of Statistics (ABS) for 2007-08 underpin the CGE model and provide details on the upstream and downstream linkages of sectors. Key assumptions adopted in CGE modelling were consistent with widely accepted values within empirical studies and qualitative assessments of cost and sale structures across sectors.</p> <p>Further information on the CGE modelling approach is contained in Attachment A.</p>

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<sup>4</sup> Neil Nelson Agvice P/L 2015, *Rix's Creek Continuation of Mining Project: Agricultural Impact Statement*, report prepared for Rix's Creek Pty Limited, August 2015.

# Attachment A: Modelling Approach

This attachment discusses and presents the economic modelling approach used to estimate the potential economic impact of the Rix's Creek Extension Project.

To estimate the economic impact of the Rix's Creek Extension Project in the Hunter Valley and NSW, this study employed a comparative static (CGE) model, described further below.

## A1: Modelling economic impacts

To model the economic impacts beyond those that directly relate to the Rix's Creek Extension Project (as outlined in section 4), it is necessary to employ a modelling technique that makes use of information about the linkages of the sector within the broader economic context. The starting point for modelling these linkages is the input-output table published by the ABS.

Input-output table data provides detailed information on the upstream and downstream linkages of each industry in the economy. Upstream linkages refer to the sources of inputs to the industry in question. These linkages may be in the form of the use of intermediate inputs produced by other domestic industries, imported intermediate inputs, labour and other factors of production. For example, the mine would use inputs such as equipment, and construction and transport services. Downstream refers to linkages to those economic agents that purchase the industry's output. Downstream linkages include sales to other industries that use the output of the Rix Creek Extension Project as an intermediate input to their own production process, including sales to foreign companies.

An input-output table is a useful tool as a snapshot of the economic flows within the economy at the time the data was collected. An input-output table can be used to provide simplified estimates of the sensitivity of the economy (measured by employment, value added or turnover) to small changes (termed 'shocks') within industries. An example of such a shock might be a one per cent increase in the production of coal for export. This might lead to a similar increase in the use of inputs required to produce the additional output including fuels, labour, transport services etc. This type of analysis can be used at the industry-wide level to estimate input-output multipliers – that is, the total economy-wide impact on employment or output resulting from a change in one industry, taking into account the change in demand for the outputs of other industries.

However, an input-output table in itself is not an economic model that can explain how the economy may react to changes such as to demand or prices. A major limitation of the use of input-output multipliers when used to conduct impact analysis is that the relationship between industry inputs and outputs (the coefficients) are fixed, implying that industry structures remain unchanged by the shock to the industry (for example, a change in demand or prices).

Effectively, input-output multipliers are based on the assumption of unlimited resources. For example extending the example above, it assumes the one per cent increase in the use of transport services or labour can be accommodated through utilising what would otherwise have been an idle resource.

In reality, the scarcity of inputs (e.g. skilled labour, fuels etc.) mean that these inputs are affected by and respond to prices (e.g. wages, fuel prices). The higher prices, due to the increased demand for transport services, will at the margin reduce demand by some other users. Therefore, the result will be that these price impacts will then have an impact on activity levels, which feed back into price effects and so on.

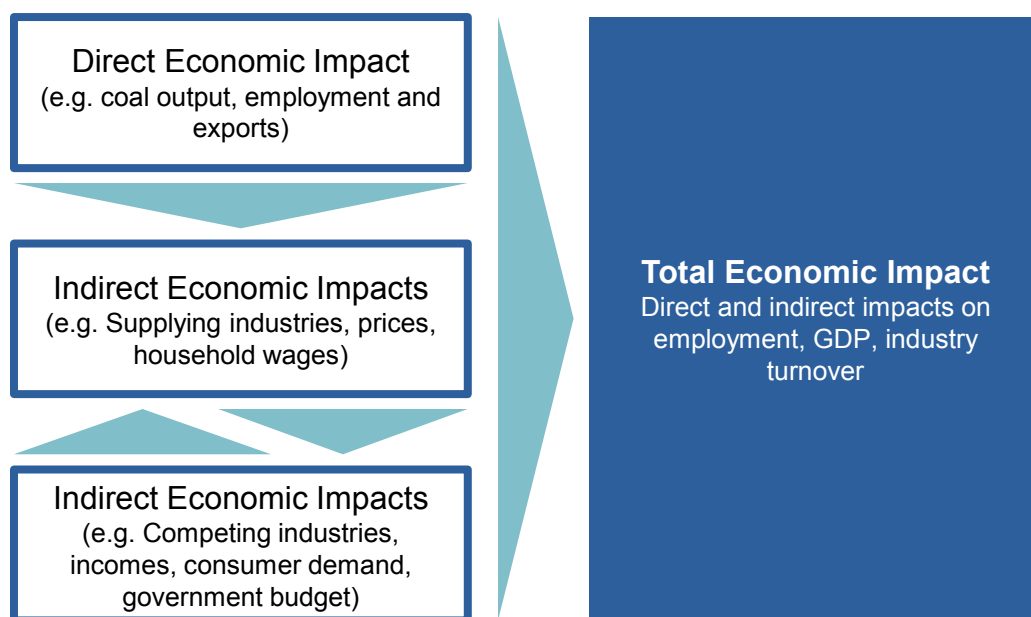
In input-output analysis, where all adjustments relate only to the quantities produced, this type of feedback response is assumed not to occur. Consequently, using an input-output model can result in an overstatement of the impacts of a change in one sector on the broader economy. For these reasons, while the ABS previously published input-output multipliers, it has ceased publishing these estimates.

A CGE model is based on an input-output table database, but is extended to make more sophisticated economic assumptions. In particular, CGE models have additional features that make them better suited for economic impact assessments, including:

- recognising resource constraints and responses of businesses, workers through adjusting prices/wages;
- capturing employment/capital (and other factor inputs) substitution for example, by responding to higher wages by increasing the use of capital; and
- capturing a much wider set of economic impacts such as behavioural responses to price changes of consumers, investors, foreigners etc.

By introducing these additional economic assumptions, we are able to model beyond the first round impact of an event or policy. This added sophistication means that a CGE model allows for feedback responses by producers, consumers, investors and foreigners. These flow-on effects mean that the results are less likely to be overstated, particularly over the medium to long term.

*Figure A1: Direct and first and second order impacts in a CGE model*



## A2: The MMRF Model

The CGE model used for the analysis is the Monash Multi-Regional Forecasting (MMRF) developed by the Centre of Policy Studies, Monash University. The MMRF model is a multi-regional, dynamic CGE model.<sup>5</sup> Depending on the application, it can separately distinguish up to eight Australian regions (six States and two Territories) and up to 144 commodities/industries. The model recognises:

- domestic producers classified by industry and domestic region;
- investors similarly classified;
- up to eight region-specific household sectors;
- an aggregate foreign purchaser of the domestic economy's exports;
- flows of greenhouse gas emissions and energy usage by fuel and user; and
- up to eight state and territory governments and the Commonwealth government.

<sup>5</sup> P. Adams, J. Dixon, J. Giesecke and M. Horridge (December 2010). MMRF: Monash Multi-Regional

Forecasting Model: A Dynamic Multi-Regional Model of the Australian Economy. General Paper No. G-223, Centre of Policy Studies, Monash University.

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The database shows the following for each state economy:

the flow of industry outputs to other industries, final demands by households, Government, investment, and exports; and

- the cost structures of industries in terms of intermediate inputs of commodities supplied by domestic industries and by imports plus the primary factors of production, labour, capital and agricultural land, other costs to production and commodity taxes and subsidies.

The model accounts for taxes and subsidies associated with all transactions and also includes margin services for all the transactions. The margin services included are to represent the costs associated with transferring products from the producer (or the port of entry in the case of imports) to final consumers and other users.

The MMRF model is able to provide analysis of how a change in one sector – such as the Rix’s Creek Extension Project – ultimately flows through to other sectors across the economy in the longer term, after labour and capital has adjusted across the economy. For example, additional mining operations and export sales would flow-on to increased demand for transport services. Stronger demand would raise average prices. In the short-term, this would lead to reduced demand for transport services by other sectors. However, in the longer term, the model captures the impact of the higher incomes flowing from increased exports and employment, thus boosting activity across the economy. The comparison of the current state with the long run state after the shock is described as a comparative static analysis.

### **A3: Model closure**

Essentially, the comparative static analysis calculates what the economy would look like if all markets were in equilibrium (a condition known as general equilibrium), that is, once all consumer, businesses, foreigners, workers and other economic agents have adjusted their behaviour in response to the new activity. This demand involves adjustment such that demand again equals supply in all product markets and for the labour, capital and other factor input markets. In this way, it is considered a long run model because these factors are slow to adjust to full equilibrium.

The general equilibrium framework imposes accounting for all additional resources needed in the economy. This means that additional assumptions are required to close the model. Key assumptions underlying the analysis are as follows:

- The labour market is assumed to be consistent with an exogenous level of national unemployment below which inflation rises. That is, in the long-run, the underlying national labour supply is not influenced by the investment project, but is primarily determined by demographic factors and technological change. The assumption on interstate migration is that unemployment in each State or Territory is exogenous, as is the inter-regional wage differentials so that population will instantly migrate between regions to take up employment opportunities.
- It is assumed that the additional output from the Rix’s Creek Extension Project Creek Extension Project is in response to additional international demand for coal exports. That is, the output does not “crowd-out” any existing coal production exports.

The model produces annual impacts from an annual shock (additional coal output and exports) and, for ease of interpretation, these have been presented in 2013-14 dollars. There is, however, no time dimension to the model; it is simply a comparison of two equilibrium states of the same economy.

### **A4: Hunter Valley Impacts**

The NSW results from MMRF are then disaggregated across regions to provide an indication of the likely impacts in the Hunter Valley region. This uses an approach that distinguishes between industries influenced by broader economic activity (tradeable) and industries that largely service the local economy (non-tradeable). The results for tradeable industries are estimated using a top-down disaggregation across the state, while the results for non-tradeable industries are estimated in response to the resulting additional activity in industry activity across the Hunter Valley region.