

# SARAJI EAST MINING LEASE PROJECT

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Environmental Impact Statement

**Chapter 18**  
Economics

**BHP**

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# Saraji East Mining Lease Project

## 18 Economics

### 18.1 Introduction

This chapter provides a summary of the economic impact assessment for the Project, as well as a description of the existing local and regional economic environment that may be affected by the Saraji East Mining Lease Project (the Project). A more detailed economic assessment can be found in **Appendix M-1 Economic Technical Report**.

### 18.2 Methodology

The economic assessment undertook two separate types of assessments:

- regional impact analysis, which is used to describe the size and nature of the effects on local, regional and state economies
- cost benefit analysis, which is used to identify the costs and benefits of the Project.

Additionally, assessment review of the economic baseline of the local and regional economy was undertaken.

#### 18.2.1 Economic baseline

The economic baseline review describes the existing local, regional, state and national economies that may be affected by the Project. The economic baseline assessment considered the following factors:

- size and structure of the existing economy
- demographic analysis
- industry analysis
- development pipeline
- coal production outlook
- agricultural production
- local property market overview
- commercial accommodation assessment.

The Project's Economic Assessment Area analysed was based on the Project location along with the consideration of likely primary sources of labour, goods and services that will be utilised by the Project. The Economic Assessment Area represents the regional economies most likely to be either directly or indirectly affected by the Project. The Economic Assessment Area is defined as:

- local economy: Isaac Local Government Area (LGA)
- regional economy: Mackay – Isaac – Whitsunday Statistical Area 4 (MIW SA4).

To determine the economic baseline of the Economic Assessment Area, a collection and review of economic data predominantly sourced from the Australian Bureau of Statistics (ABS) Census was undertaken.

The demographic analysis considered the demographic characteristics of the local and regional economies impacted by the Project, benchmarked to Queensland. Demographic analysis presented included population by age, family composition and average household incomes as of the 2006, 2011 and 2016 Censuses.

The population projections presented for Isaac LGA, MIW SA4 and Queensland are based on the latest Queensland Government Statistician's Office (QGSO) population projections (QGSO, 2015d and QGSO, 2015e), rebased to the 2016 estimated resident population estimates prepared by the ABS.

## 18.2.2 Regional economic impact assessment

The regional impact assessment estimated the direct and indirect economic impacts of the Project during the construction and operation phases on the regional, state and national economies.

The assessment utilised an input-output approach and estimated impact in terms of output, household incomes, employment and value added (Jensen and West 2001). These four different measures of economic impact are summarised in Table 18.1.

**Table 18.1 Measures of economic impact**

| Descriptor        | Description  |
|-------------------|--|
| Output            | The output impact measures the increase in gross sales throughout the entire economy by aggregating all individual transactions (direct and indirect) resulting from the economic stimulus. The output impact provides an indication of the degree of structural dependence between sectors of the economy. However, output impacts are regarded as overstating the impact on the economy as they count all goods and services used in one stage of production as an input to later stages of production, hence counting their contribution more than once.  |
| Household incomes | The household income impact measures the additional wages, salaries and supplements paid to households associated with the industry under consideration and with other industries benefiting from the stimulus to the economy.   |
| Employment        | The employment impact measures the number of full-time equivalent (FTE) positions for one year created directly and indirectly by the stimulus. However, the short-term response to increased demand may be that existing employees work overtime. Consequently, actual levels of employment generated (in terms of persons employed) will tend to be lower than those estimated by the input-output analysis. This short-term employment response (of working additional overtime) will be more prevalent where the demand stimulus is likely to be temporary and short lived, or where there is limited spare capacity in the economy (that is, when the economy is at or near full employment). |
| Value added       | The value added or Gross Regional Product (GRP) impact measures only the net activity at each stage of production resulting from a stimulus. GRP is defined as the addition of consumption, investment and government expenditure, plus net exports (exports minus imports) from a region. The value added (or GRP) impact is the preferred measure for the assessment of contribution to the economy from a stimulus or impact, and as such should be used to describe the net impact of the event. Value added is the measure of economic impact resulting from a stimulus that is preferred by economists.  |

The total economic impact of a stimulus or activity comprises the following effects:

- direct or initial effect, being the stimulus for the economic impact
- flow on effects, comprising production induced effects and consumption induced effects.

The extent of these impacts can be represented by multipliers calculated in aggregate for various regional, state or national economies. There are commonly four multipliers used to measure impact, being output, household income, employment and value added.

The assessment of impacts utilised a risk-based assessment framework based on the anticipated interaction of probability and consequence of impacts occurring (Queensland Treasury, 2011).

Table 18.2 summarises the descriptors of the likelihood of an event occurring, where Table 18.3 summarises the descriptors of the consequence of the impact occurring.

**Table 18.2 Qualitative measures of likelihood**

| Descriptor     | Description   |
|----------------|---|
| Almost certain | It is expected to occur in most circumstances             |
| Likely         | It will probably occur in most circumstances              |
| Possible       | It might occur at some time                               |
| Unlikely       | It could occur but is not expected                        |
| Rare           | It may only occur in very exceptional circumstances       |
| Remote         | It has not previously manifested but is not inconceivable |

**Table 18.3 Qualitative measures of consequence**

| Descriptor | Description of beneficial impacts  | Description of adverse impacts  |
|------------|--|---|
| Negligible | Very insignificant impacts, which would be unlikely to be measurable against benchmarks  | Very insignificant impacts, which would be unlikely to be measurable against benchmarks   |
| Minor      | Impacts may be detectable but result in only minimal changes to the established environment with the magnitude of impact being small relative to the broader context of the population/area being impacted. Benefits maintained over the short term without extended management and/or works | Impacts may be detectable but result in only minimal changes to the established environment with the magnitude of impact being small relative to the broader context of the population/area being impacted. Return to pre-impact levels achievable and expected to occur over the short term once management initiatives are implemented. |
| Moderate   | Detectable impacts resulting in significant changes to the environment. The benefit is maintained over the medium term with minimal management and/or works.   | Detectable impacts resulting in significant changes to the environment. Management initiatives can result in recovery in the medium term.   |
| Major      | Broader and longer term impacts likely to result in a highly changed environment. The benefit is maintained over the longer term with minimal management and/or works.   | Broader and longer term impacts likely to result in a highly changed environment. Long term and sustained effort required to affect a recovery.   |

| Descriptor    | Description of beneficial impacts   | Description of adverse impacts   |
|---------------|---|--|
| Extraordinary | Broader and longer term impacts likely to result in a highly changed environment. The benefit is maintained over the longer term without management and/or works. | Broader and longer term impacts likely to result in a highly changed environment. Recovery to pre-impact levels unlikely to occur despite mitigation and intervention. |

The interaction of likelihood and consequence determine the extent of impact. Table 18.4 outlines the matrix of interactions between different likelihoods and levels of consequence, which determine the level of impact.

**Table 18.4 Qualitative impact assessment matrix**

| Likelihood     | Consequence |          |          |           |               |
|----------------|-------------|----------|----------|-----------|---------------|
|                | Negligible  | Minor    | Moderate | Major     | Extraordinary |
| Remote         | Very low    | Very low | Very low | Low       | Medium        |
| Rare           | Very low    | Very low | Low      | Medium    | Medium        |
| Unlikely       | Very low    | Low      | Low      | Medium    | High          |
| Possible       | Very low    | Low      | Medium   | High      | High          |
| Likely         | Low         | Medium   | Medium   | High      | Very high     |
| Almost certain | Low         | Medium   | High     | Very high | Very high     |

### 18.2.3 Cost benefit analysis

The cost benefit analysis identifies the present value of costs and benefits over the life of the Project, presented in real dollar values. This section outlines the assumptions utilised in the cost benefit analysis and assesses the Project over a range of discount rates, with key decision criteria reported including net present value and benefit cost ratio.

In addition, the economic robustness of the Project was assessed through scenario testing. A sensitivity analysis was conducted because a range of factors can lead to significant variations in the costs and benefits of a project. Proponents can address this uncertainty by determining how sensitive the financial and economic outcomes are to specific factors. Sensitivity analysis is commonly undertaken on the discount rate, capital cost of construction, and operational input costs and the price of products.

The assumptions underpinning the cost benefit analysis are presented in Table 18.5.

Table 18.5 Assumptions for the cost benefit analysis

| Aspect               | Assumption   |
|----------------------|--|
| Project life         | Assumes construction commences in Financial Year (FY) 2021 and occurs over three years to FY 2023. Operations are anticipated to commence in FY 2023 and are expected to cease in FY 2042.   |
| Scenarios            | Approximately half of all coal exports are likely to be low volatile coking coal. For completeness, the assessment provided two scenarios when calculating the value of coal exported, these being: <ul style="list-style-type: none"> <li>base case: analysis assumed all coal exported is semi soft coking coal (semi soft coking coal attracts the lowest export price)</li> <li>alternative scenario: analysis assumed that 50% of the coal exported is semi soft coking coal, with the remaining 50% of the coal exported classified as low volatile coking coal (LVCC).</li> </ul> |
| Costs                | BMA estimates that total Project costs are anticipated to be \$7.4 billion over the life of the Project. This estimate is inclusive of construction costs, operational costs and the cost of make good agreements. This includes an allowance for biodiversity offsets, funds for make good agreements with impacted landholders, funding for impact management and monitoring, and transport make good agreements.  |
| Benefits/disbenefits | The following benefit / disbenefit streams were identified for the Project: <ul style="list-style-type: none"> <li>value of coal production (less haulage costs)</li> <li>greenhouse gas emissions</li> <li>opportunity cost of alternative land use</li> <li>value of ecosystems foregone.</li> </ul> Overall, the net benefits of the Project were estimated to be \$12.7 billion - \$13.8 billion over the life of the Project.   |

### 18.3 Economic baseline

The purpose of this section is to provide an overview of the existing economic environment in which the Project would operate. The Economics Assessment Area is described in greater detail in **Appendix M-1 Economic Technical Report**.

#### 18.3.1 Size and structure of existing economy

The population of Isaac LGA, as derived by the rebased QGSO population projections, is anticipated to increase from 21,563 persons in 2016 to 27,637 persons in 2036, or by 1.2 per cent per annum. The resident population of both MIW SA4 and Queensland is anticipated to grow at a faster rate than Isaac LGA between 2016 and 2036. The working age population (15 years and over) in each region is anticipated to increase at a faster rate than the total population between 2016 and 2036.

The most recent GRP estimates prepared by Queensland Treasury and Trade (QTT) in 2013 are reported in Table 18.6. The estimates reported pertain to the GRP of MIW SA4 and Queensland as of 2000-01 and 2010-11 and include a breakdown of GRP by industry.

Table 18.6 Nominal GRP by industry for MIW SA4 and Queensland (prices \$ million)

| Industry  | MIW SA4   |            |                | Queensland  |             |                |
|---|-----------|------------|----------------|-------------|-------------|----------------|
|   | 2000-2001 | 2010-2011  | Average change | 2000-2001   | 2010-2011   | Average change |
| Agriculture, forestry and fishing               | \$485.4   | \$615.8    | 2.4%           | \$5,478.4   | \$7,286.4   | 2.9%           |
| Mining  | \$2,446.0 | \$12,361.4 | 17.6%          | \$8,509.0   | \$28,875.7  | 13.0%          |
| Manufacturing                                   | \$371.9   | \$1,003.5  | 10.4%          | \$12,705.1  | \$21,859.1  | 5.6%           |
| Electricity, gas, water and waste services      | \$82.0    | \$228.1    | 10.8%          | \$2,331.2   | \$7,016.5   | 11.6%          |
| Construction                                    | \$283.7   | \$2,303.5  | 23.3%          | \$7,926.1   | \$25,097.5  | 12.2%          |
| Wholesale trade                                 | \$353.0   | \$752.6    | 7.9%           | \$6,760.5   | \$14,302.9  | 7.8%           |
| Retail trade                                    | \$245.9   | \$524.6    | 7.9%           | \$7,226.8   | \$14,572.8  | 7.3%           |
| Accommodation and food services                 | \$195.4   | \$387.7    | 7.1%           | \$4,079.6   | \$7,016.5   | 5.6%           |
| Transport, postal and warehousing               | \$416.1   | \$1,049.1  | 9.7%           | \$7,926.1   | \$16,731.7  | 7.8%           |
| Information media and telecommunications        | \$100.9   | \$136.8    | 3.1%           | \$4,079.6   | \$5,667.2   | 3.3%           |
| Financial and insurance services                | \$138.7   | \$296.5    | 7.9%           | \$6,760.5   | \$17,811.2  | 10.2%          |
| Rental, hiring and real estate services         | \$75.6    | \$319.3    | 15.5%          | \$2,680.9   | \$6,746.7   | 9.7%           |
| Professional, scientific and technical services | \$119.8   | \$410.5    | 13.1%          | \$5,361.8   | \$16,461.8  | 11.9%          |
| Administrative and support services             | \$63.0    | \$250.9    | 14.8%          | \$2,331.2   | \$5,667.2   | 9.3%           |
| Public administration and safety                | \$126.1   | \$319.3    | 9.7%           | \$6,410.9   | \$15,112.5  | 9.0%           |
| Education and training                          | \$176.5   | \$296.5    | 5.3%           | \$5,594.9   | \$11,064.5  | 7.1%           |
| Health care and social assistance               | \$195.4   | \$433.3    | 8.3%           | \$6,993.7   | \$17,271.4  | 9.5%           |
| Arts and recreation services                    | \$18.9    | \$22.8     | 1.9%           | \$1,165.6   | \$1,619.2   | 3.3%           |
| Other services                                  | \$122.9   | \$342.1    | 10.8%          | \$2,739.2   | \$4,857.6   | 5.9%           |
| Ownership of dwellings                          | \$286.8   | \$752.6    | 10.1%          | \$9,499.7   | \$24,827.7  | 10.1%          |
| Gross regional product                          | \$6,304.0 | \$22,807.0 | 13.7%          | \$116,561.0 | \$269,866.0 | 8.8%           |



In 2010-11, the mining sector was the most significant contributor to GRP in the MIW SA4 at \$12.4 billion, or 54.2 per cent of total GRP. Other significant industry sectors in the MIW SA4 in terms of contribution to GRP included construction, transport, postal and warehousing and manufacturing.

The most significant contributor to Queensland GRP in 2010-11 was the mining industry, although the contribution to total gross state product (GSP) was significantly lower than in the MIW SA4. Other significant industries in terms of contribution to Queensland GSP in 2010-11 included construction, manufacturing and the health care and social assistance sector.

Between 2000-01 and 2010-11 the MIW SA4 economy grew at an average annual rate of 13.7 per cent per annum, significantly above the state average (8.8 per cent per annum). The average annual growth rate in GRP in MIW SA4 significantly exceeded the state average for the following sectors – construction, administrative and support services, other services, manufacturing, and rental, hiring and real estate services.

### 18.3.2 Demographic analysis

#### Average age of residents

The average age of residents in all three regions analysed increased between 2006 and 2016. Specifically, the average age of residents in Isaac LGA increased from 31.1 years in 2006 to 32 years as of the 2016 Census, which is significantly younger than in both MIW SA4 and Queensland. The average age of residents in MIW SA4 and Queensland increased from 35.5 years and 36.8 years in 2006 to 37.2 years and 38.3 years in 2016 respectively.

Figure 18-1 reports the average age of the resident population of Isaac LGA, MIW SA4 and Queensland as at the 2006, 2011 and 2016 Censuses.

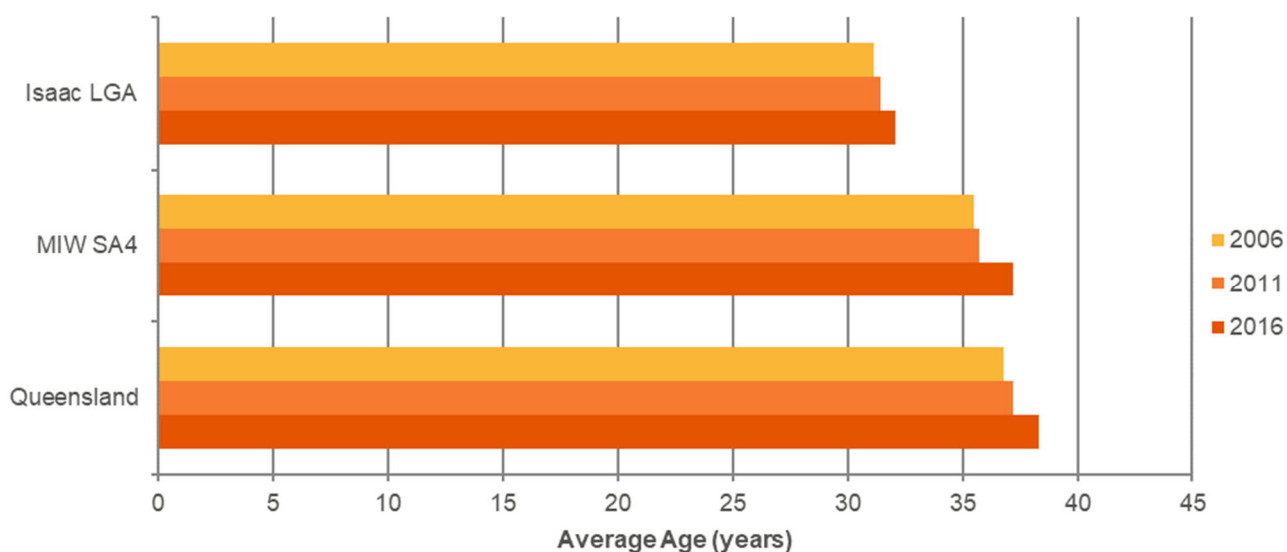


Figure 18-1 Average age of residents, Isaac LGA, MIW SA4 and Queensland, 2006-2016.

## Age profile

The average age of residents in Isaac LGA was significantly lower than Queensland as of the 2016 Census. In 2016 Isaac LGA recorded a significantly lower, relative to Queensland, proportion of:

- persons aged 15-19 years
- females aged 45-64 years
- persons aged 65 years and over.

In 2016 Isaac LGA recorded a significantly higher, relative to Queensland, proportion of:

- persons aged 0-14 years
- persons aged 25-34 years
- males aged 35-54 years.

As of the 2016 Census, MIW SA4 had a significantly lower, relative to Queensland, proportion of:

- persons aged 15-24 years
- persons aged 65 years and over.

As of the 2016 Census, MIW SA4 had a significantly higher, relative to Queensland, proportion of:

- persons aged 0-14 years
- males aged 25-64 years.

## Family composition

In all three areas analysed, couple families with children remained the dominant family type in the past three Censuses, despite declines in the incidence of this family type. In the 2006 to 2016 period, there was a corresponding increase in the proportion of single parent families and lone person households in all areas analysed.

In Isaac LGA, the proportion of couple families with children decreased from 37.4 per cent in 2006 to 32.3 per cent in 2016, whilst the proportion of single parent families increased from 5.2 per cent in 2006 to 6.3 per cent in 2016 and the incidence of lone person households increased from 16.3 per cent to 18.9 per cent over the same period.

## Average household income

Average household incomes within Isaac LGA and MIW SA4 have historically been higher than the Queensland average. However, average household incomes in Isaac LGA and MIW SA4 decreased between the 2011 and 2016 Census periods, where the Queensland average increased. This decrease in average household incomes was likely due to a downturn in the mining sector. The average weekly household income in Isaac LGA increased from \$1,902 in 2006 to \$2,361 in 2011, though subsequently fell to \$2,257 in 2016. This represents an average annual increase of 1.7 per cent over the ten-year period. As of the 2016 Census, average household incomes in Isaac LGA were approximately 33 per cent higher than the state average (\$1,691 per week) and 30 per cent higher than the MIW SA4 average (\$1,734 per week).

Trends in average weekly household incomes of Isaac LGA, MIW SA4 and Queensland between 2006 and 2016 are illustrated in Figure 18-2.

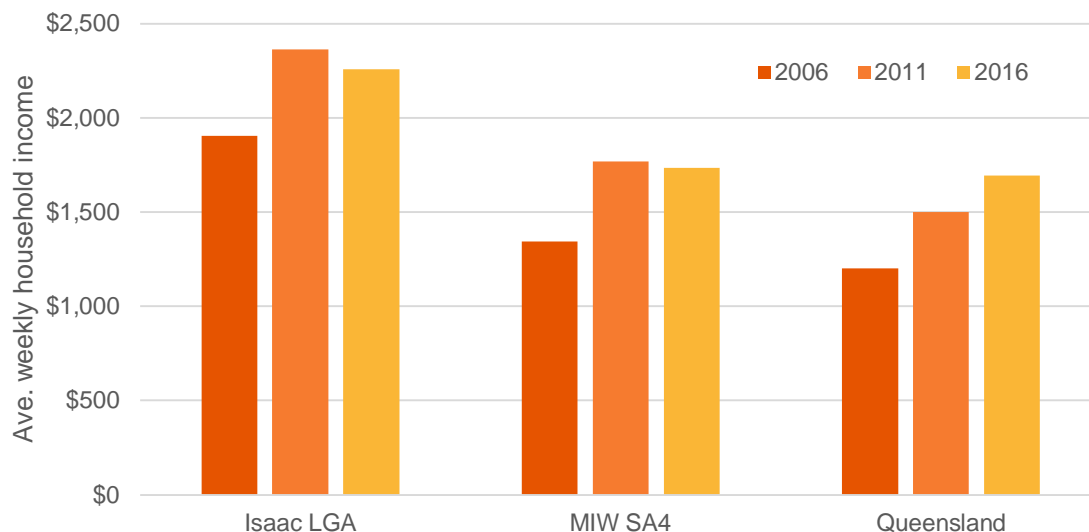


Figure 18-2 Average weekly household income, Isaac LGA, MIW SA4 and Queensland, 2006-2016.

### 18.3.3 Industry analysis

The industry analysis provides an overview of the labour market characteristics within Isaac LGA, MIW SA4 and Queensland, based on several data sources, including the Australian Government's Department of Employment (Small Area Labour Market statistics), the 2016 Census (employment by industry and occupation and post-school qualifications) and ABS business count data.

#### Labour force size

Corresponding to a lull in projects entering the development pipeline in the Mackay – Isaac – Whitsunday region in the recent past, the size of the labour force in both Isaac LGA and MIW SA4 has decreased from the highs experienced between 2012 and 2014 but showed early signs of recovery in 2016-17.

The size of the labour force in Isaac LGA decreased from 14,760 persons in 2012-13 to 12,638 persons in 2015-16 and increased to 12,938 persons by 2016-17. Similarly, the size of the MIW SA4 labour force decreased from 104,333 persons in 2013-14 to 95,049 persons in 2015-16 and increased to 98,769 persons by 2016-17. This contrasts with the total Queensland labour force which has shown positive growth in all years analysed, increasing from 2,418,190 persons in 2011-12 to 2,523,291 persons in 2016-17. Between 2015-16 and 2016-17 the size of the Isaac LGA, MIW SA4 and Queensland labour force has increased by 2.4 per cent, 3.9 per cent and 0.1 per cent respectively.

Table 18.7 shows these trends in labour force size.

Table 18.7 Labour force size

| Labour force size                     | Isaac LGA | MIW SA4 | Queensland |
|---------------------------------------|-----------|---------|------------|
| 2011-12                               | 13,987    | 97,445  | 2,418,190  |
| 2012-13                               | 14,760    | 104,165 | 2,432,922  |
| 2013-14                               | 14,548    | 104,333 | 2,469,281  |
| 2014-15                               | 13,617    | 99,983  | 2,488,878  |
| 2015-16                               | 12,638    | 95,049  | 2,521,675  |
| 2016-17                               | 12,938    | 98,769  | 2,523,291  |
| Ave. annual change 2011-12 to 2016-17 | -1.5%     | 0.3%    | 0.9%       |
| Ave. annual change 2015-16 to 2016-17 | 2.4%      | 3.9%    | 0.1%       |

### Unemployment rate

The unemployment rate in Isaac LGA has historically been significantly lower than MIW SA4 and Queensland. Similarly, the unemployment rate in MIW SA4 has also generally been lower than Queensland between 2010 and 2017, though with a temporary increase above the state level between December 2014 and March 2016.

The unemployment rate in Isaac LGA increased from 0.8 per cent in the December quarter 2010 to 1.6 per cent in the December quarter 2017, with a notable increase in unemployment in the 2014-15 financial year (to a maximum of 4.0 per cent). The unemployment rate in MIW SA4 increased from 2.7 per cent in the December quarter 2010 to 3.5 per cent in the December quarter 2017, with a notable increase in unemployment in the 2014-15 financial year to a maximum of 9.6 per cent which was above the state average at that time. Figure 18-3 presents trends with regards to the unemployment rate across the three regions.

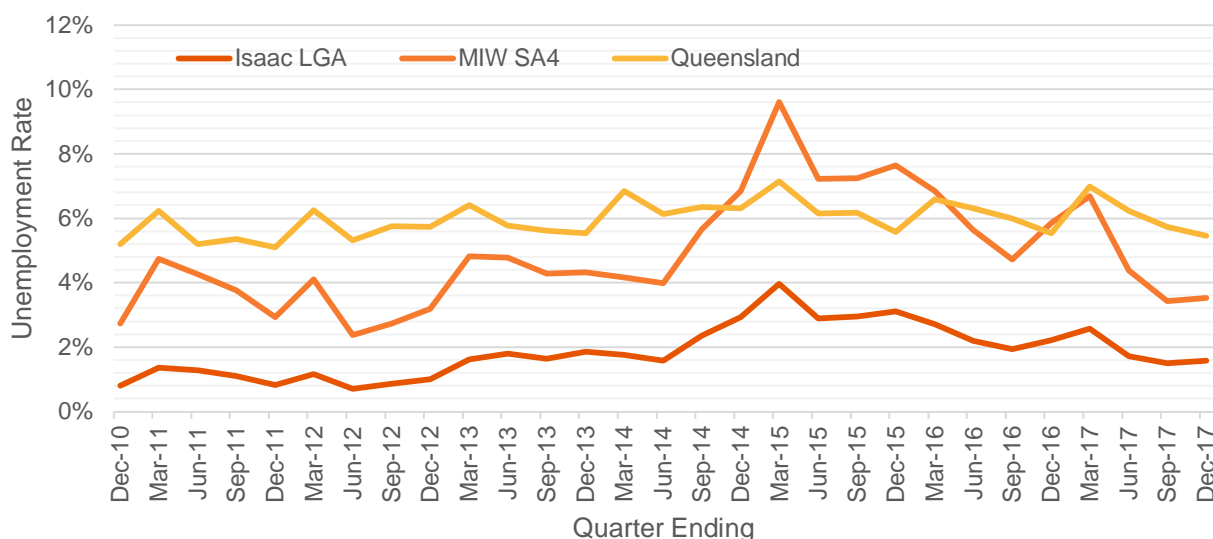


Figure 18-3 Unemployment rate, Isaac LGA, MIW SA4 and Queensland, 2010-2017

## Labour force participation

The labour force participation rate has historically been higher in Isaac LGA and MIW SA4 relative to the state average. The labour force participation rate in Isaac LGA increased from 80.0 per cent in 2011-12 to 84.0 per cent in 2013-14 and subsequently decreased to 78.5 per cent in 2016-17. The labour force participation rate in Queensland experienced a decrease from 66.8 per cent in 2011-12 to 64.5 per cent in 2016-17.

The labour force participation rate in Isaac LGA and the MIW SA4 followed a similar trend over the six years analysed, with the labour force participation rate averaging 8.6 per cent points higher in Isaac LGA than MIW SA4.

## Employment by industry

As of the 2016 Census, the mining and agriculture, forestry and fishing industries were the primary employers of the workforce residing in Isaac LGA, accounting for 37.7 per cent and 10.4 per cent of employment respectively. Other significant industries of employment within Isaac LGA included:

- education and training – accounting for 6.6 per cent of employment
- accommodation and food services – accounting for 6.5 per cent of employment
- other services – accounting for 5.7 per cent of employment.

Although accounting for a lower proportion of total employment than in Isaac LGA, the mining industry was also the key employer in MIW SA4, accounting for 14.4 per cent of total employment as of the 2016 Census. Other significant industries of employment within MIW SA4 as of the 2016 Census included:

- retail trade – accounting for 9.3 per cent of employment
- health care and social assistance – accounting for 9.1 per cent of employment
- other services – accounting for 8.5 per cent of employment
- accommodation and food services – accounting for 8.2 per cent of employment.

For comparison, the most significant industries of employment within Queensland as of the 2016 Census included the health care and social assistance (13.0 per cent of employment), retail trade (9.9 per cent of employment), construction (9.0 per cent of employment) and education and training (9.0 per cent of employment) sectors.

Table 18.8 reports the resident employment by industry for Isaac LGA, MIW SA4 and Queensland as of the 2016 Census.

**Table 18.8 Employment by industry, 2016**

| Industry                                   | Isaac LGA | MIW SA4 | Queensland |
|--|-----------|---------|------------|
| Agriculture, forestry and fishing          | 10.4%     | 5.5%    | 2.8%       |
| Mining                                     | 37.7%     | 14.4%   | 2.3%       |
| Manufacturing                              | 3.0%      | 5.5%    | 6.0%       |
| Electricity, gas, water and waste services | 1.1%      | 0.9%    | 1.1%       |
| Construction                               | 3.5%      | 7.0%    | 9.0%       |
| Wholesale trade                            | 1.3%      | 3.0%    | 2.6%       |
| Retail trade                               | 5.1%      | 9.3%    | 9.9%       |
| Accommodation and food services            | 6.5%      | 8.2%    | 7.3%       |
| Transport, postal and warehousing          | 4.0%      | 6.3%    | 5.1%       |
| Information media and telecommunications   | 0.2%      | 0.5%    | 1.2%       |

| Industry  | Isaac LGA | MIW SA4 | Queensland |
|---|-----------|---------|------------|
| Financial and insurance services                | 0.3%      | 1.1%    | 2.5%       |
| Rental, hiring and real estate services         | 1.0%      | 1.6%    | 2.0%       |
| Professional, scientific and technical services | 1.4%      | 3.6%    | 6.3%       |
| Administrative and support services             | 3.6%      | 3.4%    | 3.5%       |
| Public administration and safety                | 4.1%      | 4.2%    | 6.6%       |
| Education and training                          | 6.6%      | 7.1%    | 9.0%       |
| Health care and social assistance               | 3.9%      | 9.1%    | 13.0%      |
| Arts and recreation services                    | 0.6%      | 0.8%    | 1.6%       |
| Other services                                  | 5.7%      | 8.5%    | 8.2%       |

## Occupation

As of the 2016 Census, lower blue-collar (predominantly associated with trades and lower skilled jobs) occupations represented the dominant occupation type within Isaac LGA, accounting for 35.3 per cent of employment. This contrasts with MIW SA4 and Queensland where the dominant occupation type was lower white-collar occupations, accounting for 29.2 per cent and 35.3 per cent of employment respectively. Lower white-collar workforce were under represented relative to Queensland, accounting for 19.7 per cent of employment as of the 2016 Census.

## Qualifications

As of the 2016 Census, the proportion of the population aged 15 years and above holding a post-school qualification in Isaac LGA, MIW SA4 and Queensland was 41.8 per cent, 43.1 per cent and 48.3 per cent respectively. The lower incidence of post-school qualification holders within Isaac LGA relative to Queensland is primarily due to a lower proportion of persons with a bachelor's degree or higher (10.4 per cent in Isaac LGA, 18.3 per cent in Queensland). However, reflective of the high representation of employment within the mining industry, Isaac LGA and MIW SA4 both had a higher incidence of the population aged 15 years and above attaining a certificate qualification relative to the state average.

## Business activity

As of June 2017, there were 1,637 registered businesses operating within Isaac LGA, of which 1,017 businesses were classified as sole traders, 592 businesses employed between 1 and 19 personnel and 28 businesses employed between 20 and 199 personnel. Of all registered businesses in Isaac LGA, 696 businesses or 42.5 per cent of businesses operated within the agriculture, forestry and fishing industry, with the next most significant industry of business operation being construction, accounting for 10.4 per cent of all registered businesses. As of June 2017, there were no businesses operating within Isaac LGA which employed 200 or more personnel.

As of June 2017, there were 14,631 registered businesses operating within MIW SA4, of which 8,794 were classified as sole operators, 5,456 businesses employed between 1 and 19 personnel, 372 businesses employed between 20 and 199 personnel and nine businesses employed 200 or more personnel. Of all registered businesses in MIW SA4, 3,155 businesses or 21.5 per cent of businesses operated within the agriculture, forestry and fishing industry, 2,287 businesses or 15.6 per cent of businesses operated within the construction industry and 1,675 businesses or 11.4 per cent of businesses operated within the rental, hiring and real estate services industry.

Of the registered businesses employing more 200 or more personnel, three were within the wholesale trade industry, three were within the transport, postal and warehousing industry and three were within the other services industry.

As of June 2017, there was a significantly higher representation of registered businesses within Isaac LGA and MIW SA4 operating in the agriculture, forestry and fishing industry relative to Queensland. Queensland had a higher incidence of businesses operating within the professional, scientific and technical services industry, the health care and social assistance industry and the financial and insurance services industry relative to Isaac LGA and MIW SA4. The proportion of registered business in Queensland that were classified as sole traders was not significantly different from that of Isaac LGA and MIW SA4. Table 18.9 provides a comparison of the composition of registered businesses by industry that were registered within Isaac LGA, MIW SA4 and Queensland as of June 2017.

**Table 18.9 Regional comparison of businesses by industry**

| Industry  | Isaac LGA    | MIW SA4       | Queensland     |
|---|--------------|---------------|----------------|
| Agriculture, forestry and fishing               | 42.5%        | 21.6%         | 9.4%           |
| Mining  | 0.7%         | 1.0%          | 0.4%           |
| Manufacturing                                   | 1.7%         | 3.2%          | 3.7%           |
| Electricity, gas, water and waste services      | 0.0%         | 0.2%          | 0.3%           |
| Construction                                    | 10.4%        | 15.6%         | 17.2%          |
| Wholesale trade                                 | 1.7%         | 1.9%          | 3.0%           |
| Retail trade                                    | 5.2%         | 4.8%          | 5.7%           |
| Accommodation and food services                 | 3.2%         | 4.0%          | 4.0%           |
| Transport, postal and warehousing               | 4.6%         | 5.9%          | 6.3%           |
| Information media and telecommunications        | 0.4%         | 0.3%          | 0.7%           |
| Financial and insurance services                | 3.7%         | 5.9%          | 8.3%           |
| Rental, hiring and real estate services         | 8.1%         | 11.4%         | 11.6%          |
| Professional, scientific and technical services | 3.5%         | 6.5%          | 11.0%          |
| Administrative and support services             | 2.8%         | 3.2%          | 3.9%           |
| Public administration and safety                | 0.0%         | 0.2%          | 0.3%           |
| Education and training                          | 1.2%         | 1.2%          | 1.4%           |
| Health care and social assistance               | 2.0%         | 4.2%          | 5.7%           |
| Arts and recreation services                    | 0.4%         | 0.8%          | 1.1%           |
| Other services                                  | 5.8%         | 6.9%          | 4.7%           |
| Currently unknown                               | 2.0%         | 1.1%          | 1.2%           |
| <b>Total</b>                                    | <b>1,637</b> | <b>14,631</b> | <b>437,586</b> |

### 18.3.4 Agricultural production

In 2015-16, Isaac LGA produced agricultural commodities which had a value of \$549.71 million, accounting for 49.1% of the total value of agricultural commodities produced in MIW SA4 and 4.2% of the total value of agricultural commodities produced in Queensland.

The most significant agricultural commodities produced in Isaac LGA in 2015-16 were cattle and calves for slaughter with 866,106 head, which had a value of \$480.30 million or 8.2% of Queensland

meat cattle and calf production, and sorghum, producing 128,066 tonnes which had a value of \$33.94 million or 10.9% of Queensland sorghum production.

### 18.3.5 Existing and projected coal production

Saleable coal production within the MIW region increased from 205.7 million tonnes in 2012-13 to 237.6 million tonnes in 2016-17 or 4.9 per cent per annum. Saleable coal production volumes were highest in both the MIW region and Queensland in 2014-15. The MIW region increased its share of total Queensland saleable coal production from 63 per cent in 2012-13 to 66 per cent in 2016-17.

There are a further 22 coal mine development projects which are presented in the pipeline. These include projects that have been recently approved but yet to commence operation and those in which an Environmental Impact Statement (EIS) is under preparation. If all 22 projects were to proceed, this would represent an additional coal production of approximately 278 million tonnes per annum (Mtpa).

### 18.3.6 Residential, commercial and industrial property markets

The residential property market experienced a significant downturn after 2011-12. By 2017-18 prices and annual sales had stabilised at a median sale price in the order of \$150,000 and approximately 230 sales per annum (Pricefinder, 2018).

Median weekly residential rents decreased significantly between 2012 and 2018; though have recently shown signs of modest recovery. As of the September quarter 2018, the median weekly rents for three bedrooms houses, four-bedroom houses and three-bedroom townhouses were \$250 per week, \$290 per week and \$350 per week respectively (Pricefinder, 2018).

## 18.4 Potential impacts

### 18.4.1 Regional economic impact assessment

#### Project expenditures

BMA estimated indicative capital and operating expenditures for the Project which have been used as inputs to the estimation of the regional, state and national stimulus generated by the Project.

The construction costs associated with the Project are estimated at \$1,313.0 million, comprising:

- \$420.2 million incurred within MIW SA4
- \$538.3 million incurred within the rest of Queensland
- \$91.9 million incurred within the rest of Australia
- \$262.6 million incurred overseas.

Construction costs are anticipated to be incurred over a three-year period with costs highest in the second year (FY 2022) totalling \$590.9 million.

The breakdown of indicative expenditures by year and by region in which they are likely to be incurred are presented in Table 18.10.

Project expenditures incurred overseas represent direct imports and as such do not make an economic contribution at a regional, state or national level and hence are excluded from the economic impact analysis.



Table 18.10 Anticipated capital expenditures (\$ million)

| MIW SA4 |         |         | Rest of Queensland |         |         | Rest of Australia |         |         | International |         |         |
|---------|---------|---------|--------------------|---------|---------|-------------------|---------|---------|---------------|---------|---------|
| FY 2021 | FY 2022 | FY 2023 | FY 2021            | FY 2022 | FY 2023 | FY 2021           | FY 2022 | FY 2023 | FY 2021       | FY 2022 | FY 2023 |
| \$168.1 | \$189.1 | \$63.0  | \$215.3            | \$242.3 | \$80.8  | \$36.8            | \$41.4  | \$13.8  | \$105.0       | \$118.2 | \$39.4  |

Total operational costs are estimated at \$5,982.4 million over the life of the Project, comprising:

- \$2,852.4 million incurred within MIW SA4
- \$1,480.6 million incurred within the rest of Queensland
- \$1,641.4 million incurred within the rest of Australia
- \$8.0 million incurred overseas.

### Impacts of construction

This section reports the results of the economic contribution analysis pertaining to the construction related expenditures between FY 2021 and FY 2023, which are specified for the regional, state and national economies individually. The results of the analysis are represented by the multipliers described above in Section 18.2.2, namely contribution to output, household income, employment and value added.

#### Output

The total output impacts for the MIW SA4, Rest of Queensland and Rest of Australia economies resulting from the construction phase of the Project are estimated at:

- MIW SA4 -total contribution to output of \$674.7 million, comprising \$420.2 million in direct contribution and \$254.5 million indirectly
- Rest of Queensland – total contribution to output of \$1,013.7 million, comprising \$538.3 million in direct contribution and \$475.3 million indirectly
- Rest of Australia – total contribution to output of \$185.3 million, comprising \$91.9 million in direct contribution and \$93.4 million indirectly.

Output impacts are anticipated to be most significant within the construction, mining and manufacturing sectors at the regional, state and national level.

#### Household income

During the construction phase of the Project, household income impacts for the MIW SA4, Rest of Queensland and Rest of Australia economies are estimated at:

- MIW SA4 - total contribution to household income of \$140.3 million, comprising \$84.7 million in direct contribution and \$55.5 million indirectly
- rest of queensland – total contribution to household income of \$213.7 million, comprising \$102.2 million in direct contribution and \$111.5 million indirectly
- rest of Australia – total contribution to household income of \$40.6 million, comprising \$18.1 million in direct contribution and \$22.5 million indirectly.

The industries that are likely to contribute to regional incomes most significantly are the construction industry, the manufacturing industry and the mining industry.

### *Employment*

During the construction phase, the average yearly contribution to employment made by expenditures pertaining to construction related activities at the regional, state and national level are estimated at:

- MIW SA4 - average employment contribution of 445 FTEs, comprising 226 direct FTEs and 219 indirect FTEs
- rest of queensland - average employment contribution of 719 ftes, comprising 236 direct ftes and 483 indirect ftes
- rest of australia – average employment contribution of 143 FTEs, comprising 46 direct FTEs and 97 indirect FTEs.

Employment impacts are anticipated to be highest in the manufacturing and construction sectors for all regions analysed.

### *Value added*

During the construction phase of the Project total value added impacts for the MIW SA4, Rest of Queensland and Rest of Australia economies are estimated at:

- MIW SA4 - total contribution to value added of \$258.8 million, comprising \$151.7 million in direct contribution and \$107.0 million indirectly
- rest of queensland – total contribution to value added of \$389.6 million, comprising \$195.1 million in direct contribution and \$194.6 million indirectly
- rest of Australia – total contribution to value added of \$72.4 million, comprising \$33.3 million in direct contribution and \$39.2 million indirectly.

Value added impacts are anticipated to be highest within the construction, mining and manufacturing sectors in all regions analysed.

## **Impacts of operation**

This section of the report provides an overview of the likely contribution to the regional, state and national economy during the operational phase of the Project.

### *Output*

During the operational phase of the Project total value added impacts for the MIW SA4, Rest of Queensland and Rest of Australia economies are estimated at:

- MIW SA4 - total contribution to value added of \$258.8 million, comprising \$151.7 million in direct contribution and \$107.0 million indirectly
- rest of queensland – total contribution to value added of \$389.6 million, comprising \$195.1 million in direct contribution and \$194.6 million indirectly
- rest of australia – total contribution to value added of \$72.4 million, comprising \$33.3 million in direct contribution and \$39.2 million indirectly.

Value added impacts are anticipated to be highest within the construction, mining and manufacturing sectors in all regions analysed.

Within the MIW SA4 economy, contribution to output is likely to be greatest from the mining industry, accounting for 43 per cent of all output impacts over the operational phase of the Project, with the wholesale trade industry also likely to be a significant contributor to output. Within the rest of Queensland economy, the wholesale trade industry is likely to be the most significant contributor to output, accounting for 43 per cent of all output effects over the operational phase of the Project. Within the rest of Australia economy, the wholesale trade industry is also likely to be the most significant contributor to output, accounting for 45 per cent of all output effects over the operational phase of the Project.

*Household income*

Total household income contribution within the regional, state and national economy during the operational phase of the Project is estimated at:

- MIW SA4 – total household income contribution of \$1,207.4 million, comprising \$682.4 million in direct household income contribution and \$525.0 million in indirect household income contribution
- rest of queensland – total household income contribution of \$658.3 million, comprising \$418.4 million in direct household income contribution and \$239.9 million in indirect household income contribution
- rest of australia – total household income contribution of \$809.2 million, comprising \$491.6 million in direct household income contribution and \$317.6 million in indirect household income contribution.

Within the MIW SA4 economy, contribution to household income is likely to be greatest from the wholesale trade and mining sectors. Household income impacts are anticipated to be most significant in the wholesale trade sector for both the Rest of Queensland and the Rest of Australia economies.

*Employment*

The Project is expected to contribute significantly to employment at the regional, state and national level. Contribution to employment during the operational phase of the Project is anticipated to average:

- MIW SA4 – average employment contribution of 683 FTEs, comprising 385 direct FTEs and 299 indirect FTEs
- rest of queensland – average employment contribution of 407 ftes, comprising 253 direct ftes and 153 indirect ftes
- rest of Australia – average employment contribution of 508 FTEs, comprising 307 direct FTEs and 201 indirect FTEs.

The wholesale trade industry is likely to be the greatest contributor to employment during the operational phase of the Project across all regions analysed.

*Value added*

Total contribution to value added during the operational phase of the Project is estimated to be:

- MIW SA4 – total contribution to value added of \$2,313.9 million, comprising \$1,227.4 million directly and \$1,086.5 million indirectly
- rest of queensland – total contribution to value added of \$1,122.0 million, comprising \$683.0 million directly and \$439.0 million indirectly
- rest of Australia – total contribution to value of added of \$1,352.4 million, comprising \$774.8 million in direct contribution and \$577.6 million indirectly.

**Value of coal exported**

The Project is anticipated to produce approximately 109.7 million tonnes of metallurgical coal over a 20-year production schedule, comprising a mix of hard coking coal, semi soft coking coal and pulverised coal injection coal. The composition of the coal produced is yet to be determined.

The total export value of the coal produced is estimated to be \$14.3 billion to \$15.3 billion over the 20-year production schedule of the Project. Assuming Queensland coal mining royalty rates remain unchanged (Business Queensland, 2018), this will yield royalties of approximately \$1.2 billion to \$1.3 billion over the life of the Project.

The forecasts (KPMG, 2018), currency and price related analysis was adopted and developed without input from BHP subject matter expert personnel and do not reflect BHP's commercial in confidence pricing assumptions, forecasts, projections or analysis.

## Opportunity cost of the Project

The opportunity cost of any given Project is generally defined as the next best alternative use of the resources that will be foregone because of the Project. Thus, in the central Queensland region, the most common economic use of the land is for cattle grazing.

The production parameters for cattle grazing in the Central Queensland region are typically:

- average production cycle: approximately three years
- slaughter value: approximately \$1,500 per head
- stocking rate: approximately two head per hectare (ha)
- gross margin: approximately 15 per cent.

The Project Footprint is estimated to be 3,541 ha and the analysis has conservatively assumed that cattle can be grazed over the entire mine lease area. As the Project represents an underground coal mine, it has been assumed that cattle grazing on the site can continue, but over a smaller area due to subsidence. The assessment has assumed that up to 20 per cent of the Project footprint will be disturbed resulting from subsidence.

Therefore, the opportunity cost of the Project is terms of annual output foregone and annual gross margin foregone is estimated to be approximately \$0.71 million and \$0.11 million, respectively.

## Ecosystem services foregone

The Project is likely to disrupt and adversely impact regional ecosystems which provide habitats for a number of species. The total regional ecosystem anticipated to be impacted by the Project is estimated to be 1,261 ha.

There is also anticipated to be 2,280 ha of non-remnant vegetation disturbed by the Project.

**Chapter 6 Terrestrial Ecology** identifies an extensive range of mitigation measures for minimising and managing impacts to vegetation and fauna. Where any significant residual impact is likely to occur to a Matter of National Environmental Significance (MNES) and Matters of State Environmental Significance (MSES), offsets are required under Australian and Queensland government policies. Offsets selected will be managed to deliver a net benefit, particularly in regards to an improvement in condition and context of the protected offset area.

This study adopts the benefit transfer approach utilising parameters values identified in Costanza et al. (2014) and De Groot et al. (2012), adjusted to 2018 Australia dollars, rounded to the nearest \$100. The ecosystem services values applied in this analysis are as follows:

- Forest: \$4,700 per ha per year
- Woodland: \$2,400 per ha per year
- Wetland: \$38,500 per ha per year
- Grassland: \$6,200 per ha per year.

Based on the above assumptions, the Project is anticipated to have an adverse ecosystem services impact of \$4.2 million per annum.

Table 18.11 Estimated annual value of ecosystems impacted by the Project

| Biome        | Impacted area (ha) | Ecosystem service value (2018 AUD/ha/year) | Annual ecosystem value (AUD million) |
|--------------|--------------------|--|--------------------------------------|
| Forest       | 338                | \$4,700                                    | \$1.6                                |
| Woodland     | 912                | \$2,400                                    | \$2.2                                |
| Wetland      | 11                 | \$38,500                                   | \$0.4                                |
| Grassland    | 0                  | \$6,200                                    | \$0.0                                |
| <b>Total</b> | <b>1,261</b>       |  | <b>\$4.2</b>                         |

### Assessment of Project impacts

The Project is anticipated to result in a range of beneficial impacts including:

- economic stimulus to the regional, state and national economies during the construction and operational phases of the Project
- significant export revenues from coal produced over the life of the Project estimated to be in the order of \$14.9 billion, which assuming royalty rates remain unchanged, would yield royalties of approximately \$1.3 billion over the life of the Project
- increased employment opportunities within Central Queensland which would serve to reduce unemployment within the region
- opportunities for suppliers in the MIW region to support the construction and operation of the Project.

The Project is anticipated to result in a range of adverse impacts including:

- opportunity cost of the Project in terms of foregone output from cattle grazing
- loss of ecosystem services within areas directly impacted by the Project's operation
- tightening of the local and regional labour market potentially resulting in increased labour costs
- potential for skills shortages
- potential for inflationary pressure in the MIW residential, commercial and industrial property markets
- increased burden on MIW infrastructure, such as road networks.

Following the risk assessment methodology as outlined in Section 18.2.2, Table 18.12 provides an assessment of the anticipated positive (+ve) economic impacts resulting from the Project.

Table 18.12 Assessment of positive economic impacts

| Description of impact   | Likelihood     | Consequence | Impact     |
|---|----------------|-------------|------------|
| <p><b>Economic stimulus to the regional economy during construction and operation</b></p> <ul style="list-style-type: none"> <li>Regionally based project expenditures during the construction phase are estimated to make contributions to value added in the MIW region at an average of \$86.3 million per year between FY 2021 and FY 2023, including \$50.6 million in direct value added</li> <li>Regionally based project expenditures during the operation phase are estimated to make contributions to value added in the MIW region at an average of \$115.7 million per year, including \$61.4 million in direct value added.</li> </ul> | Almost certain | Moderate    | High (+ve) |
| <p><b>Economic stimulus to the state economy during construction and operation</b></p> <ul style="list-style-type: none"> <li>State based project expenditures during the construction phase are estimated to make contributions to GRP at an average of \$129.9 million per year over years one to three, including \$65.0 million in direct value added</li> <li>State based project expenditures during the operation phase are estimated to make contributions to GRP at an average of \$56.1 million per year, including \$34.1 million in direct value added.</li> </ul>  | Almost certain | Minor       | Low (+ve)  |
| <p><b>Economic stimulus to the national economy during construction and operation</b></p> <ul style="list-style-type: none"> <li>Project expenditures incurred interstate during the construction phase are estimated to make contributions to GRP at an average of \$24.1 million per year over years one to three, including \$11.1 million in direct value added</li> <li>Project expenditures incurred interstate during the operation phase are estimated to make contributions to GRP at an average of \$67.6 million per year, including \$38.7 million in direct value added.</li> </ul>  | Almost certain | Minor       | Low (+ve)  |
| <p><b>Increased regional supply chain and employment opportunities throughout construction and operation</b></p> <p>The project is anticipated to generate additional regional supply chain activity. The volume of this activity is represented by the output measure. During the operational phase of the Project, total output impacts pertaining to the MIW region, are estimated at an average of \$267.1 million per annum, including \$142.6 million in direct impacts. The employment support generated by this local supply chain activity is estimated at an average of 683 FTEs per annum, including 385 direct FTEs per annum.</p>      | Almost certain | Moderate    | High (+ve) |

Table 18.13 provides an assessment of the anticipated adverse (-ve) economic impacts resulting from the Project. The impact rating is on a pre-mitigation basis. Legislation requires BMA to mitigate adverse impacts and the mitigation actions that will be implemented as part of the Project will comply with the legislative requirements.

Table 18.13 Assessment of adverse economic impacts

| Description of impact   | Likelihood     | Consequence | Impact       |
|---|----------------|-------------|--------------|
| <p><b>Opportunity cost of the project</b></p> <p>The opportunity cost of the Project in terms of alternative economic uses estimated by foregone output is estimated to be approximately \$0.71 million per annum, which represents an average annual gross margin of approximately \$0.11 million.</p>   | Almost certain | Minor       | Medium (-ve) |
| <p><b>Loss of ecosystem services</b></p> <p>Based on a total area of 1,261 ha of directly impact forestry, woodland, wetland and grassland habitat, the Project is anticipated to have adverse ecosystem services impacts of \$4.2 million per annum.</p>   | Almost certain | Moderate    | High (-ve)   |
| <p><b>Increased inflationary pressure in the regional labour markets</b></p> <p>The Project is anticipated to generate a significant amount of employment demand throughout its construction and operational phases. In the event that the regional economy was facing an employment constraint, this additional employment would have the potential to create inflationary pressure in the labour market. However, labour markets in the MIW region generally have excess capacity and as such the potential for this adverse impact to materially add to wage inflation at a regional or state level is considered low.</p> | Unlikely       | Minor       | Low (-ve)    |
| <p><b>Potential for inflationary pressure in local residential, commercial and industrial property markets</b></p> <p>Projects that generate significant employment and supply chain demand can have impacts on local and regional property markets in the form of inflationary pressure. It is considered that the potential of the Project to manifest these pressures is low.</p>  | Unlikely       | Minor       | Low (-ve)    |
| <p><b>Increased burden on local and regional infrastructure</b></p> <p>The Project is likely to generate impact on local and regional transport infrastructure throughout its development and operation. The Project will contribute to increased traffic volumes on the road network, as well as increased utilization regional rail networks.</p>   | Almost certain | Minor       | Low (-ve)    |

### 18.4.2 Cost benefit analysis

The cost benefit analysis for the Project considered a number of non-market goods and as such the appropriate test discount rates need to be consistent with real discount rates used for public projects derived from social time preference or social opportunity cost rates.

A range of discount rates are used by government assessment agencies for the purposes of project evaluation. This analysis utilised the real discount rates of four per cent, seven per cent and ten per cent, which are consistent with the range of discount rates used by Infrastructure Australia.

Table 18.14 summarises the findings of the cost benefit analysis (base case scenario) and Table 18.15 summarises the findings of the alternative scenario. Under all real discount rates analysed, the Project provides a positive net benefit, with the benefit cost ratio ranging between 1.3 and 1.7.

**Table 18.14 Cost benefit analysis results – base case scenario**

| Cost/benefit stream   | Net present value (\$m) under real discount rate |           |           |
|---|--|-----------|-----------|
|   | 4%   | 7%        | 10%       |
| <b>Project Costs (construction, operational and make good agreements) (\$m)</b> |  |           |           |
| Total   | \$5,056.6  | \$3,959.5 | \$3,197.4 |
| <b>Project benefits / disbenefits (\$m)</b>                                     |  |           |           |
| Total   | \$7,764.2  | \$5,568   | \$4,107.2 |
| Net benefit   | \$2,707.6  | \$1,608.5 | \$909.7   |
| Benefit cost ratio  | 1.5  | 1.4       | 1.3       |

**Table 18.15 Cost benefit analysis results – alternative scenario**

| Cost/benefit stream   | Net present value (\$m) under real discount rate |           |           |
|---|--|-----------|-----------|
|   | 4%   | 7%        | 10%       |
| <b>Project Costs (construction, operational and make good agreements) (\$m)</b> |  |           |           |
| Total   | \$5,056.6  | \$3,959.5 | \$3,197.4 |
| <b>Project benefits / disbenefits (\$m)</b>                                     |  |           |           |
| Total   | \$8,419.8  | \$6,039.0 | \$4,455.3 |
| Net benefit   | \$3,363.2  | \$2,079.5 | \$1,257.8 |
| Benefit cost ratio  | 1.7  | 1.5       | 1.4       |

Scenario testing was also undertaken in addition to the main case analysis outlined above to test the economic robustness of the Project. The three scenario tests identified included:

- an increase in project costs of ten per cent
- a decrease in project benefits of ten per cent
- a combined increase in project costs of ten per cent and a decrease in project benefits of ten per cent.

The net present value under all scenarios remains positive under all real discount rates analysed.

## 18.5 Mitigation measures

There are a number of potential adverse economic impacts will be largely offset by opportunities created by the Project.

These adverse economic impacts will likely only be experienced during the life of the Project which is expected to be 23 years (three-year construction phase and 20 year operational phase). Management of these risks are required in order to mitigate any potential negative economic consequences, which would entail:

- loss of ecosystem services based on the total area directly impacting the identified habitats
- the opportunity cost of the Project in terms of lost cattle grazing opportunities (although these will be offset by the improvement of the economic conditions and opportunities in the region)
- tightening of the local and regional labour markets potentially resulting in increased labour costs unless and until labour market responds with additional supply



- potential short-term worsening of skills shortages in the construction sector during the construction phase
- potential localised inflation in residential, commercial and industrial property markets
- increased burden on local and regional infrastructure, including transport networks.

### 18.5.1 Increased labour costs and skill shortages

The Project has the potential to increase labour costs within the region, particularly during the construction phase. To mitigate this potential impact the following actions are recommended:

- Promote the additional purchasing opportunities that the project will generate to the 200 plus Local Buy Program registered businesses which make up a key component of BMA's existing local supplier base. The advanced promotion of the additional opportunities will enable local businesses to plan and then secure purchase orders and thereby support the further expansion and development of the local labour force and its skills base.
- Work with BMA's local partners in the Local Buying Program to deliver training programs to raise skill levels of existing and new small business and other personnel attracted to the region as a result of the supply opportunities generated by the project.
- Maintain and expand the focus of BHP's Community Development Management Plans (CDMP) and related social investment spending on local education and training programs. This will include the employment of additional apprenticeships to be part of the Project's operational workforce. This represents a strong contribution to mitigating the potential risks of future skills shortages.

### 18.5.2 Localised inflation in the housing market

The Project will include, if required, an accommodation facility which may consist of a temporary construction village to support the construction stages. As such the potential for inflationary pressure in the local or regional housing market will be mitigated. BMA advises that the reference to "if required" means that it is committed to ensuring its workforce is suitably accommodated while also not causing substantial accommodation prices inflation to the detriment of people seeking affordable accommodation. As at 2018, there are unoccupied existing dwellings in the Isaac Regional Council (IRC) area. If this situation was to continue, the proposed accommodation facility may not be required. However, in the past, there have been periods when there has not been any surplus accommodation available in the region to readily absorb the substantial increase in demand that is associated with a new project. This is particularly the case when other projects are advanced by other proponents at the same time. As BMA cannot control these externally determined factors, it is considered prudent to plan for a new facility in case it is required given accommodation market conditions at the unknown time in the future when the project is executed.

BMA had included an operational accommodation village within the scope of the Project at the commencement of the EIS. However, following consideration of Social Impact Assessment (SIA) related consultation with the Office of Coordinator General (OCG) and IRC after the completion of this section of the EIS, it became evident to BMA that these key stakeholders did not agree that the proposed operational village was warranted. As a result, BMA is no longer pursuing approval of the operational village as part of the EIS process.

BMA anticipates that there will be sufficient number of BMA-owned dwellings in Dysart and Moranbah to accommodate the Project personnel who may choose to move to the LGA, and sufficient beds at existing accommodation villages in Dysart and Moranbah for non-local personnel.

As all non-local personnel will be accommodated in local workforce accommodation villages, impacts on short term accommodation are not expected. On the expectation that BMA will provide housing in Dysart and Moranbah for all personnel who wish to move to the Isaac LGA, impacts on housing affordability as the result of personnel settling locally are not expected.

### 18.5.3 Increased burden on local and regional infrastructure

The Project will involve the relocation of the existing water pipeline and 132 kilovolt (kV) powerline into a new infrastructure and transport corridor. The Project will likely contribute to increased traffic volumes on the road network, thereby accelerating deterioration of the network. The Project will also increase the utilisation of the Goonyella railway network for the haulage of coal to Hay Point and Dalrymple Bay coal terminals. The network is expected to be able to accommodate the Project's production. Potential impacts on traffic and transportation services are discussed in **Chapter 14 Transport**.

## 18.6 Summary and conclusions

The assessment has identified and estimated the potential economic impacts associated with the Project. The assessment has been conducted taking into account the existing context of the Project, the additional and prolonged impacts of the Project and adoption of appropriate mitigation measures.

The Project would lead to significant positive direct and indirect economic impacts as a result of the investment in the construction and operation of the Project. The positive impacts would be experienced at the regional, state and national level. However, the distribution of the economic impact may not be uniform across all businesses and individuals and some may experience negative economic impacts. On balance, the positive impacts are anticipated to outweigh any potential negative impacts.