Abbot Point Growth Gateway Project: Economic Impact Study

Final Report

July 2015

ECONOMIC ASSOCIATES

Abbot Point Growth Gateway Project: Economic Impact Study

Final Report

Prepared for:

Advisian
Level 3, 60 Albert Street
BRISBANE QLD 4000

Prepared by:

Economic Associates Pty Ltd
ACN 085 445 610

PO Box 541 Spring Hill QLD 4004
Telephone: (07) 3839 1011
Facsimile: (07) 3839 1022

July 2015

15032 Report Rev 2

ECONOMIC ASSOCIATES

TABLE OF CONTENTS

LIST OF TABLES & FIGURES

ABBREVIATIONS

ABS	Australian Bureau of Statistics
A$	Australian Dollars
ARIA+	Accessibility/Remote Index of Australia
CPI	Consumer Price Index
CSG	Coal seam gas
EIS	Environmental Impact Statement
EPBC Act	Environmental Protection and Biodiversity Conservation Act 1999
€	Euro
FTE	Full Time Equivalent
GRP	Gross regional product
GSP	Gross state product
MIW	Mackay, Isaac and Whitsunday
Mtpa	Millions of tonnes per annum
NQBP	North Queensland Bulk Ports
NTA	Native Title Agreement
OESR	Office of Economic and Statistical Research
pa	Per annum
PCI	Pulverised coal injection
Pj	Petajoules
RC	Regional Council
ROM	Run of Mine
SD	Statistical Division
SEWPaC	Department of Sustainability, Environment, Water, Pollution and Communities
SLA	Statistical Local Area
TR	Tourism Region
VFR	Visiting Friends and Relatives
US$	United States Dollars

EXECUTIVE SUMMARY

This report represents a background technical document prepared to support the Environmental Impact Statement (EIS) of the Abbot Point Growth Gateway Project. This report provides:

- An overview of the methodological approach to the economic impact assessment;
- An overview of the existing economic environment of the local and regional economies in which the Project is located;
- An analysis of the potential economic impacts of the Project; and
- Mitigation measures to ensure any adverse economic impacts are avoided or minimised.

Project Background

The Port of Abbot Point is located approximately 25km north of Bowen and is Australia's most northerly coal port. The Port of Abbot Point has both State and national significance insofar as there are few locations along Queensland's eastern seaboard where deep water (>15m) is so close to the coast. In financial year 2015, the Port of Abbot Point had throughput of approximately 28.7Mt. Significant expansion to the T1 terminal (X50) in 2011 has expanded current capacity to 50 million tonnes per annum (Mtpa).

The Abbot Point Growth Gateway Project will develop infrastructure to support development at the Port of Abbot Point. The current Project relates to the development of infrastructure to support development of planned Terminal 0 (T0). Dredging of berth pockets and arrival/departure apron is required to provide safe shipping access to the T0 offshore facility. The scope of the approved T0 project does not directly include dredging of the required berth pockets or apron areas.

This proposed Project involves:

- Construction of an onshore dredged material containment pond (DMCP) within the area previously allocated for the development of T2 and adjoining industrial land;
- Capital dredging of approximately 1.1 million m^3 (Mm^3) *in situ* volume of previously undisturbed seabed for new berth pockets and ship apron areas required to support the development of T0;
- Relocation of the dredged material to the DMCPs and offshore discharge of return water; and
- Ongoing management of the dredged material including its removal, treatment, and beneficial reuse within the port area and the State Development Area (SDA), where appropriate.

Existing Economic Environment

The economic regions considered relevant for the Project include: the Bowen statistical local area (SLA), Whitsunday Regional Council area (Whitsunday RC) and the Mackay Isaac Whitsunday (MIW) region.

Between 2014 and 2036, population growth within the Bowen SLA (1.6% per annum) and Whitsunday RC (1.7% per annum) is expected to run below the Queensland average (1.9% per annum). Population growth within the MIW region over the same period is expected to run slightly higher at 2% per annum. However, the growth in the working age population (15-64 year

olds) is anticipated to track with or exceed the State average (1.2% per annum) within the Bowen SLA (1.2% per annum) and Whitsunday RC (1.3% per annum), while the working age population in the MIW region is expected to increase by 0.9% per annum.

As at the 2011 Census, the age profile of the host regions was generally skewed towards working age males relative to the Queensland average. Population projections by age tend to indicate that the over-representation of residents within the working age cohorts will over time contribute to an acceleration of the region's aging population.

Household incomes among Whitsunday RC households were below the Queensland average, while household incomes within the MIW region were considerably higher, indicating to some extent that residents of the Whitsunday RC have not benefited from rising incomes associated with resource sector development to the same extent as MIW region households.

Labour force participation across Queensland has reduced since 2011, however declines in labour force participation within the host regions has been less than that experienced at a State wide level. Unemployment has generally worsened across Queensland and the host regions since 2012, with unemployment levels currently above the Queensland average in Bowen SLA and Whitsunday RC. Unemployment within the MIW region remains well below the State average.

There are currently a range of resource projects moving through the planning and assessment phases. In total there are currently 13 coal projects, one mineral project and two other (transport infrastructure) projects identified within the MIW region (but outside of Whitsunday RC). The most significant of these projects in terms of estimated capital expenditure are Carmichael mine and rail ($6 billion) and Grosvenor underground mine ($2 billion). Within the Whitsunday RC there are currently three coal projects progressing through the planning and assessment process, with Byerwen open cut coal mine ($1.5 billion) the most significant in terms of capital expenditure.

Analysis of gross regional product and regional competitive advantage indicates that the Whitsunday RC and MIW region are likely to experience continued growth and competitive advantage within the primary sector. Growth in the primary sector is likely to be driven by the mining sector with a number of mining projects in the development pipeline (refer to section 3.2.5). The agriculture, forestry and fishing sector recorded a decline in the working population between 2006 and 2011; this trend is anticipated to continue with a decline although at a slower rate.

Analysis of local and regional residential property markets indicates:

- Significant growth in the median price of residential property between 2001 and 2014 in all markets; and
- Average annual median price growth of 9.2% for houses and 4.2% for units within the MIW Region between 2001 and 2014, however median residential price growth was more subdued from 2007 onwards in all markets.

Analysis of local and regional commercial property markets indicates:

- The number of commercial property sales peaked at 113 sales in 2005 in MIW region;
- Limited sales in Bowen SLA;
- Median sale price per square metre peaked in 2009; and

- Median sale price per square metre significantly higher in MIW region than Bowen SLA and Whitsunday RC.

Analysis of local and regional industrial property markets indicates:

- Sales volumes in the MIW region were highest in the 2004-2006 period;
- The median sale price per square metre in the MIW region peaked in 2010, with a significant decline recorded in 2011; and
- The median sale price per square metre in the Bowen SLA and Whitsunday RC peaked in 2009 with significant declines recorded in 2010 and 2011.

Overall, there has been a softening in residential, commercial and industrial property markets across the host regions since 2010, with the number of sales generally declining across all sectors and regions post 2010 and there being a consequent softening of price growth over the same period.

In the June quarter 2014, the study area had the following accommodation:

- Bowen SLA: 6 hotels, motels and serviced apartments with a total of 157 rooms;
- Whitsunday RC: 32 hotels, motels and serviced apartments with a total of 2,322 rooms; and
- MIW Region: 86 hotels, motels and serviced apartments with a total of 4,283 rooms.

Occupancy rates for hotels, motels and serviced apartments in Bowen SLA peaked in September quarter 2011 at 75.3%, but have since fallen considerably to 38.5% in June 2014. The average occupancy rate from September quarter 2010 and June quarter 2014 for hotels, motels and serviced apartments in Bowen SLA (49.6%) was lower than the Whitsunday RC (55.2%), MIW Region (54.0%) and State average (63.3%), pointing to a potential excess supply of short-term accommodation within the Bowen SLA.

Within the Bowen SLA, the average number of vacancies per night averaged 100 rooms (Table 3.14). This provides a significant vacancy buffer to absorb short-term increases in accommodation demand potentially resulting from the Project.

In August 2013, the Queensland Treasury and Trade undertook a survey of regional retail prices of goods and services between Brisbane (comprising Brisbane, Ipswich, Moreton Bay and Redland local government areas) and 27 regional centres[1].

The index assumes that Brisbane = 100.0. The index number in each centre provides an indication of the relative level of prices compared to Brisbane.

Within the Whitsunday RC indexes were collated for Bowen and Cannonvale. In the broader MIW Region (excluding Whitsunday RC) indexes were collated for Mackay and Moranbah.

The Retail Price Index highlights that the overall cost of living in the study area relative to Brisbane is:

- 0.4% lower in Bowen;
- 4.3% higher in Cannonvale;

[1] Regional centres included: Ayr, Beaudesert, Bowen, Bundaberg, Cairns, Cannonvale, Charleville, Charters Towers, Dalby, Emerald, Gatton, Gladstone, Gold Coast, Gympie, Kingaroy, Longreach, Mackay, Maryborough, Moranbah, Mount Isa, Rockhampton, Roma, Sunshine Coast, Toowoomba, Townsville, Warwick and Weipa.

- 6.3% higher in Mackay; and
- 22.2% higher in Moranbah.

The construction price index, as reported in the Rawlinson's Australian Construction Handbook, provides an indication of construction costs relative to Brisbane (Brisbane = 100). The construction price index was reported for the following towns within the MIW region:

- Mackay (115);
- Whitsunday Islands (130);
- Airlie Beach (115); and
- Bowen (115).

The above indicates that construction costs within the MIW region are generally 15% higher than in Brisbane.

Overall, the host regions can be characterised as having local and regional economies that are heavily dependent on primary production (agriculture and mining), and as such have generally experienced significant stimulus from major resource sector investment, although much of this stimulus has been concentrated within the MIW region outside of the Whitsunday RC.

Estimated Economic Impacts

The Project is expected to generate significant economic activity during the construction phase. However, it should be noted that the works associated with the construction phase are highly capital intensive. As such, while employment generated by the Project is significant, it is not as significant as what might occur in another heavy and civil engineering construction[2] project.

Construction Phase Impacts

Construction costs for the Project are anticipated to be between $50 million and $100 million[3]. The estimation of economic impacts during the construction phase is reported as a range of estimated economic impacts. Being a heavy and civil engineering construction project, the majority of construction phase impacts are within the construction sector.

Although procurement for the Project is yet to be finalised, it is anticipated that construction services, materials and inputs could potentially be sourced from within the MIW region.

Output impacts relate to the overall economic activity generated by project expenditures. As such, output is a measure of activity or turnover of expenditure as opposed to net value.

The output impacts of the Project during its construction phase are anticipated to be between:

- $62.60 million, comprising $50.00 million in direct output and $12.60 million in indirect output; and

[2] Capital dredging projects are classified as 'heavy and civil engineering construction' projects under the Australia and New Zealand Standard industry Classification system.

3 These construction cost estimates were provided by the Department of State Development and have been estimated based on concept design and on current market prices. As a tender process is currently being undertaken for the Project, an exact figure cannot be provided to ensure the integrity and accountability of the tender process.

- $125.19 million, comprising $100.00 million in direct output and $25.19 million in indirect output.

Household income impacts relate to changes in incomes, predominantly in the form of wages and salaries paid to workers, as a result of the impact generated by the Project. However, it is important to note that workers on engineering construction projects typically move from project to project within in any given region. As such, this Project could be considered an addition to the pipeline of project work that these workers might be engaged on, or that might be generating employment demand within the region.

The household income impacts of the Project during its construction phase are anticipated to be between:

- $9.90 million, comprising $6.78 million in direct household income, and $3.12 million in indirect household income; and
- $19.80 million, comprising $13.56 million in direct household income, and $6.24 million in indirect household income.

Changes in employment resulting from the Project might arise as either new employment opportunities or additional shifts for existing workers. Employment impacts are measured as Full Time Equivalents (FTEs), which represent approximately 1,800 hours of labour.

Employment impacts of the Project during its construction phase are anticipated to be between:

- 82 FTEs, comprising 39 direct FTEs and 43 indirect FTEs; and
- 164 FTEs, comprising 78 direct FTEs and 86 indirect FTEs.

Value added represents the net value of economic activity generated by the construction phase of the Project. Value added represents the combination of remuneration to employees (e.g. wages and salaries) and gross operating surplus of business entities.

Value added impacts of the Project during its construction phase are anticipated to be between:

- $23.25 million, comprising $17.49 million in direct value added and $5.76 million in indirect value added; and
- $46.50 million, comprising $34.98 million in direct value added and $11.51 million in indirect value added.

Operating Phase Impacts

The construction phase comprises capital dredging and the construction of the DMCP for dredged material. Subsequent to the completion of dredging there will be ongoing costs associated with managing the DMCP. These operating costs are expected to average approximately $1.25 million per annum over a five year period[4].

Table 4.2 reports the annual operating impacts of the Project. These annual impacts would run for approximately five years, resulting in a total operating cost of $6.25 million.

Specifically, annual operating economic impacts of the Project are estimated at:

[4] Operating costs were provided by the Department of State Development.

- $1.56 million in output, comprising $1.25 million in direct output and $0.31 million in indirect output;
- $0.25 million in household income, comprising $0.17 million in direct household income and $0.08 million in indirect income;
- 2.1 FTEs, comprising one direct FTE and 1.1 indirect FTEs; and
- $0.58 million in value added, comprising, $0.44 million in direct value added and $0.14 million in indirect value added.

Value of Exports Facilitated

The export throughput of the Port of Abbot Point between 2013 and 2014 was 22.9 million tonnes (Mt) of coal. The existing capacity of the Port of Abbot Point is approximately 50Mtpa. Capital dredging of the Abbot Point Growth Gateway Project will allow for the development of the approved Adani Abbot Point Coal Terminal 0 Project (EPBC 2011/6194) and increase export capacity by an additional 70Mtpa. The vast majority of additional coal throughput would be thermal coal, sourced from the Galilee Basin.

A short- to medium-term thermal coal price in the order of USD70/t and an exchange rate of between 0.70USD and 0.80USD implies an Australian dollar denominated coal price of between approximately $88/t and $100/t. The Project could facilitate additional throughput of 70Mtpa of largely thermal coal which would have a value in the order of $6.1 billion to $7.0 billion.

Opportunity Cost of Project

Alternative Uses for the Placement Site

Opportunity cost represents the next best alternative to what is being proposed. In terms of potential marine impacts, the opportunity cost is represented by the loss of vegetation habitats that generate a range of use (e.g. fisheries) and non-use values. However onshore the opportunity cost is likely to be an economic use associated with port operations. The onshore area predominantly affected is the DMCP, which was designated for an alternative development. Apart from utilising the T2 site for onshore placement of dredged material, discussions NQBP and the DSD indicated that there are no short to medium term plans to use the T2 site. Use of the land for dredged material placement is likely to sterilise the land for an economic use for the short-term over which time the site would need to be dewatered and compacted.

As such, the opportunity cost of the use of the T2 site for onshore placement of dredged material and the subsequent short to medium term sterilisation of that land for an alternative use is unlikely to have a material opportunity cost. This is because there are no immediate plans for alternative use of the land and as such it will be retained as vacant strategic port land in the short to medium term.

Vegetation Communities to be Impacted

Direct impacts occur predominantly within and immediately adjacent to infrastructure footprints where dredges excavate the seabed. Direct impacts typically involve irreversible loss of benthic habitats and communities, where irreversible is defined as lacking a capacity to return or recover to a state resembling that prior to being impacted within a timeframe of five years or less.

The direct impact area covers approximately 61ha, comprising 10.5 hectares within the berth pocket areas and 50.5 hectares within the apron areas. Advisian advise that seagrass coverage in these areas is approximately 5%, which represents 0.5 hectares of seagrass within the berth pockets and 2.5 hectares of seagrass within the aprons (refer to Table E.1 below). Advisian also advise that seagrass cover can be expected to return to approximately 5% within the aprons area, while the habitat within the berth pockets would simply be open substrate. The return of seagrass within the aprons indicates that there would be no permanent loss of seagrass within the aprons. The extent of area of seagrass loss within the berth pockets would become an area of open seabed, including establishment of communities similar to those of surrounding open seabed (offsetting to some extent the loss of ecosystem services provided by the seagrass).

TableE.1: Area of direct impacts

	Berth Pockets	Aprons
Total area (ha)	10.5 ha	50.5 ha
Condition - Current	Seagrass at 5% cover	Seagrass at 5% cover
Seagrass cover (ha)	0.5 ha	2.5ha
Condition - Years 1 to 5 (conservative)	Open Substrate	Open Substrate
Condition - Years 6 to 20	Open Substrate	Seagrass at 5% cover

Source: Data provided by Advisian

This study derives values based on Costanza *et al* (1997) which is itself a meta-analysis of a range of detailed environmental and ecosystem services valuation studies across a range of vegetation communities and habitats across a range of regions around the world.

The habitat areas that are anticipated to be impacted by the Project are seagrass meadows and other benthic areas. Constanza *et al* (1997) reports values for seagrass at approximately $23,720/ha/annum. This value is based on a range of studies of well-established seagrass meadows. Seagrass coverage within the Project study area is ranges from between 1% and 10%, which represent low levels of seagrass coverage. This implies a need to moderate the Constanza *et al* (1997) seagrass values. This is done based on advice from Advisian (2015) which has calculated the area of seagrass based on total area multiplied by coverage. The Costanza *et al* seagrass value is applied to this area of seagrass, with the balance area subject to an alternative measure estimated by Costanza *et al* (1997) as a general value for coastal marine habitats of ~$5,065/ha/annum.

The calculation of direct impacts on marine habitat within the berth pockets and aprons assumes the permanent loss of seagrass within the berth pockets, but replaced by open substrate, and a five year loss of seagrass within the aprons.

Based on the parameter values articulated above, the annual value of direct impacts is estimated at:

- Berth pocket: 0.5 hectares of removed seagrass valued at $23,720/ha offset by the emergence of an open substrate habitat valued at $5,065/ha, culminating in an annual loss of ecosystem services of $9,328; and
- Aprons: 2.5 hectares of removed seagrass replaced by open substrate for five years, representing an annual ecosystem services loss of $46,638 for that five year period.

Based on a test discount rate of 6%, the above reductions in ecosystem services represent a capitalised value of $155,467 within the berth pockets and $196,456 within the aprons.

Summary of Anticipated Economic Impacts

The Project is anticipated to have a range of economic impacts, which in the context of existing public policy settings associated with employment and export growth could be considered positive, including:

- Facilitating (in association with a range of other major projects) the export of up to an additional 70Mtpa of largely thermal coal from Queensland, and the royalties associated with those exports;
- Generating economic activity within the MIW region within the heavy and civil construction sector, generating additional employment opportunities; and
- Generating opportunities for in-region supplies of support services to heavy and civil construction projects.

The Project also has the potential for a number of adverse impacts including:

- Opportunity cost of the Project in terms of lost ecosystem services;
- Short-term impacts on availability of housing and short-term accommodation associated with the construction phase of the Project; and
- Increased burden on local and regional infrastructure, particularly during the construction phase.

Table E.2 below provides an assessment of the potential economic impacts resulting from the Project.

Table E.2: Assessment of economic impacts

Description of Impact	Nature (+ve or -ve)	Likelihood	Consequence	Impact
Facilitation of thermal coal exports The proposed Project will increase the coal throughput capacity of the Port of Abbot Point by approximately 70Mtpa. Based on a short to medium term thermal coal price in the order of USD70/t and an exchange rate of between 0.70USD and 0.80USD, an Australian dollar denominated coal price of between approximately $88/t and $100/t can be estimated. The Project could facilitate additional throughput of 70 Mtpa of largely thermal coal which would have a value in the order of $6.1 billion to $7.0 billion. However, it is noted that this Project is one of a number of projects that is required to enable additional coal exports, as such the consequence of this impact needs to be moderated in light of this.	+ve	Likely	Moderate	Medium
Creation of additional employment opportunities/demand The Project is anticipated to generate employment opportunities equivalent to between 82 and 164 FTE positions, comprising 39 to 78 direct FTEs and 43 to 86 indirect FTEs, during the less than one year construction phase. After the construction phase, operational employment benefits would manifest for approximately five years in the	+ve	Almost certain	Minor	Medium

Description of Impact	Nature (+ve or -ve)	Likelihood	Consequence	Impact
order of one FTE. These might not be in the form of new 'jobs' per se but rather a continued stream of employment opportunity for heavy and civil construction workers and their supply chains that rely on project-based work.				
Creation of supply chain opportunities The indirect or flow-on economic impacts of the Project in terms of additional economic activity stimulated for supply chain firms is anticipated to be modest, as reflected in the value of indirect output impacts (i.e. between $12.60 million and $25.19 million compared to between $50.00 million and $100.00 million in direct impacts).	+ve	Almost certain	Minor	Medium
Opportunity cost of the Project The net value of direct negative impacts on ecosystem services is estimated at: • Berth pocket: 0.5 hectares of removed seagrass valued at $23,720/ha offset by the emergence of an open substrate habitat valued at $5,065/ha, culminating in an annual loss of ecosystem services of $9,328; and • Aprons: 2.5 hectares of removed seagrass replaced by open substrate for five years, representing an annual ecosystem services loss of $46,638 for that five year period. Based on a test discount rate of 6%, the above reductions in ecosystem services represent a capitalised value of $155,467 within the berth pockets and $196,456 within the aprons.	-ve	Almost certain	Minor	Medium
Potential short-term impacts on the local housing and short-term accommodation market The Project will generate short-term demand for housing for workers directly and indirectly sourced by the Project. It is noted that short-term occupancy rates within the Bowen SLA are below the regional and State averages indicating significant capacity in local short-term accommodation markets. It is also noted that there is a large stock of vacant rental housing within Bowen available for short-term lease.	-ve	Unlikely	Minor	Low
Increased burden on local and regional infrastructure The Project will possibly impose additional burden on the local and regional infrastructure network during the construction phase. However, operational impacts would be negligible. The impacts on the local and regional infrastructure network would be almost entirely within the transport network and would be mitigated through measures addressed in the Traffic Impact Management Plan.	-ve	Possible	Minor	Low

Mitigation Measures

Impacts Requiring Mitigation

Opportunity cost of the Project in terms of lost ecosystem services

It is anticipated that measures to minimise and mitigate environment impacts to seagrass and other marine plants providing ecosystem services are addressed in the marine ecology assessment of the EIS.

Localised inflation in the local housing and accommodation market

The Project has limited potential to result in increased housing costs within the host region, particularly during construction. However, the potential for this impact is significantly constrained by the high vacancy rates noted in commercial accommodation within Bowen, and the significant stock of rental housing available for short-term lease in this town.

To ensure that impacts are minimised it is recommended that the proponent consider housing the Project workforce across a mix of short-term accommodation and rental housing. This will ensure that there remains capacity in the short-term accommodation and rental housing markets to accommodate non-Project related visitors through the duration of the Project.

Increased burden on local and regional infrastructure

The Project has the potential to impact on the capacity of local and regional infrastructure, mainly relating to the road transport networks. The potential impacts, management and mitigation strategies are discussed in the Road Transport Impact Assessment of the EIS.

Summary

The potential impacts of the Project are not anticipated to be high and are generally short-term. In addition, mitigation measures will be implemented to reduce the likelihood of the potential impacts. The increase in labour demand resulting from the Project is small in the context of the host economy. Mitigation measures recommended above are appropriate given the anticipated scale of impacts that need to be managed.

1 INTRODUCTION

An Environmental Impact Statement (EIS) is being prepared for the Abbot Point Growth Gateway Project (the Project).

The Port of Abbot Point is located approximately 25km north of Bowen and is Australia's most northerly coal port. The Port of Abbot Point has both State and national significance insofar as there are few locations along Queensland's eastern seaboard where deep water (>15m) is so close to the coast. In financial year 2015, the Port of Abbot Point had throughput of approximately 28.7Mt. Significant expansion to the T1 terminal (X50) in 2011 has expanded current capacity to 50 million tonnes per annum (Mtpa).

The Abbot Point Growth Gateway Project will develop infrastructure to support development at the Port of Abbot Point. The current Project relates to the capital dredging associated with the approved (EPBC 2011/6194) Adani Abbot Point Coal Terminal 0 (T0). Dredging of berth pockets and arrival/departure apron is required to provide safe shipping access to the T0 offshore facility. The scope of the approved T0 project does not directly include dredging of the required berth pockets or apron areas.

This proposed Project involves:

- Construction of an onshore dredged material containment pond (DMCP) within the area previously allocated for the development of T2 and adjoining industrial land;
- Capital dredging of approximately 1.1 million m^3 (Mm^3) *in situ* volume of previously undisturbed seabed for new berth pockets and ship apron areas required to support the development of T0;
- Relocation of the dredged material to the DMCPs and offshore discharge of return water; and
- Ongoing management of the dredged material including its removal, treatment, and beneficial reuse within the port area and the State Development Area (SDA), where appropriate.

This report represents a background technical document prepared to support the EIS. This report provides:

- An overview of the methodological approach to the economic impact assessment;
- An overview of the existing economic environment of the local and regional economies in which the Project is located;
- An analysis of the potential economic impacts of the Project; and
- Mitigation measures regarding adverse economic impacts.

2 METHODOLOGY

2.1 Scope of Assessment

The purpose of this assessment is to examine the Project in terms of its anticipated economic impacts. The principal focus of this report is on regional and State impacts. Local and national impacts are discussed where relevant.

The geographic scope of local and regional economies is defined as:

- Local economy: Whitsunday Regional Council (RC) (and Bowen Statistical Local Area - SLA[5], where relevant); and
- Regional economy: the Mackay Isaac Whitsunday region (the MIW region)[6].

2.2 Approach to Assessment

2.2.1 Existing Economic Environment

The existing economic environment section provides an overview of the existing economic profile of the local and regional economies likely to be affected by the Project, and provides a baseline to assess the significance of potential Project-related impacts. The baseline economic data collected during this stage of the assessment was used to develop a regional impact model to assess Project impacts.

In preparing the existing economic environment section, data was sourced from:

- Various Australian Bureau of Statistics (ABS) catalogues, including the Census of Population and Housing, labour force survey, regional population growth, Australian Business Register and survey of tourist accommodation;
- Queensland Government Statisticians Office (QGSO);
- Various local and Queensland Government agencies;
- Property market data; and
- Proprietary Economic Associates models.

2.2.2 Economic Impact Assessment

This section of the report sources data from the Existing Economic Environment and modelled impacts of Project expenditures to analyse and assess the economic impacts of the Project.

The economic impact assessment uses a regional input-output approach, which provides indicative results relating to the total demand generated by the Project during its construction and operational phases in terms of output, household incomes, employment and value added.

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

[5] The Bowen SLA was selected instead of the Bowen SA2, because the Bowen SLA represents a broader area that incorporates both Abbot Point and the town of Bowen, while the Bowen SA2 is limited to the town of Bowen and does not include Abbot Point.

[6] The MIW Region is comprised of the Mackay, Isaac and Whitsunday regional councils.

- Direct or initial effect: being the stimulus for the economic impact, typically described as the change in sales or contribution to final demand by the stimulus or activity.
- Flow-on effects, comprising production-induced effects and consumption-induced effects, including:
  - First-round production effects: being those purchases of inputs required from other industry sectors in the economy to produce the additional output generated by the stimulus or activity;
  - Industrial support production effects: being those second, third and subsequent-round industrial flow-on effects stimulated by the purchases made in the first round; and
  - Consumption induced effects: being those purchases made by households upon receiving additional income from labour payments stemming from the production of additional output generated by the stimulus or activity under assessment.

The extent of these impacts can be represented by multipliers calculated in aggregate for various regional, State or national economies. As stated above, there are commonly four multipliers used to measure impact – namely, output, household income, employment and value added (refer to Table 2.1 below for additional detail).

Two sets of the above multipliers can be generated, namely:

- Type 1 Multipliers, which estimate the direct and production-induced impacts of a stimulus or activity; and
- Type 2 Multipliers, which estimate the direct, production-induced and consumption-induced impacts of a stimulus or activity.

Type 1 Multipliers would be used in the analysis of this Project. Queensland Treasury's preference is for use of only Type 1 Multipliers, given that Type 2 Multipliers typically overstate the extent of consumption-induced impacts of any given stimulus or activity.

Table 2.1 below provides a discussion of the different measures of economic impact.

Table 2.1: Measures of Economic Impact

Impact Measure	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 income	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.

Impact Measure	Description
	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

Source: Jensen, R. & West, G. (2001) Community Economic Analysis, Department of Primary Industries: Brisbane, Qld

The regional input-output approach has a number of limitations, which may result in overestimation of impacts, including:

- The absence of capacity constraints such that the supply of each good is perfectly elastic, implying that each industry can supply whatever quantity is demanded of it and there are no budget constraints;
- The assumed linearity and homogeneity of the input function, which implies constant returns to scale and no substitution between inputs. This occurs because the approach assumes inputs purchased by each industry are a function only of the level of output of that industry;
- Each commodity, or type of commodity, is supplied by a single industry sector, implying there is only one method used to produce each commodity and each sector has only a single primary output;
- The assumption that the economy is in equilibrium at given prices and that the economy is not subject to other external influences; and
- The additivity assumption suggests the total effect of carrying on several types of production is the sum of the separate effects, which is not a true reflection of economic systems.

Despite these limitations the approach adopted is considered appropriate insofar as the host region and Queensland generally has a mature coal and coal logistics sector. The above limitations are typically most relevant when introducing a wholly new economic driver to a State or regional economy that may result in significant structural change. The proposed Project represents the expansion of coal export operations from one of Queensland's most significant coal ports.

2.2.3 Mitigation Strategies

This section identifies strategies that may assist in avoiding, minimising or mitigating adverse economic impacts of the project, while facilitating the enhancement of positive economic impacts. Mitigation strategies have been formulated having regard to the anticipated likelihood and severity of impacts. Where appropriate mitigation measures have been formulated based on professional experience and understanding such that adverse impacts are mitigated, and any positive impacts are enhanced.

3 EXISTING ECONOMIC ENVIRONMENT

3.1 Population Projections

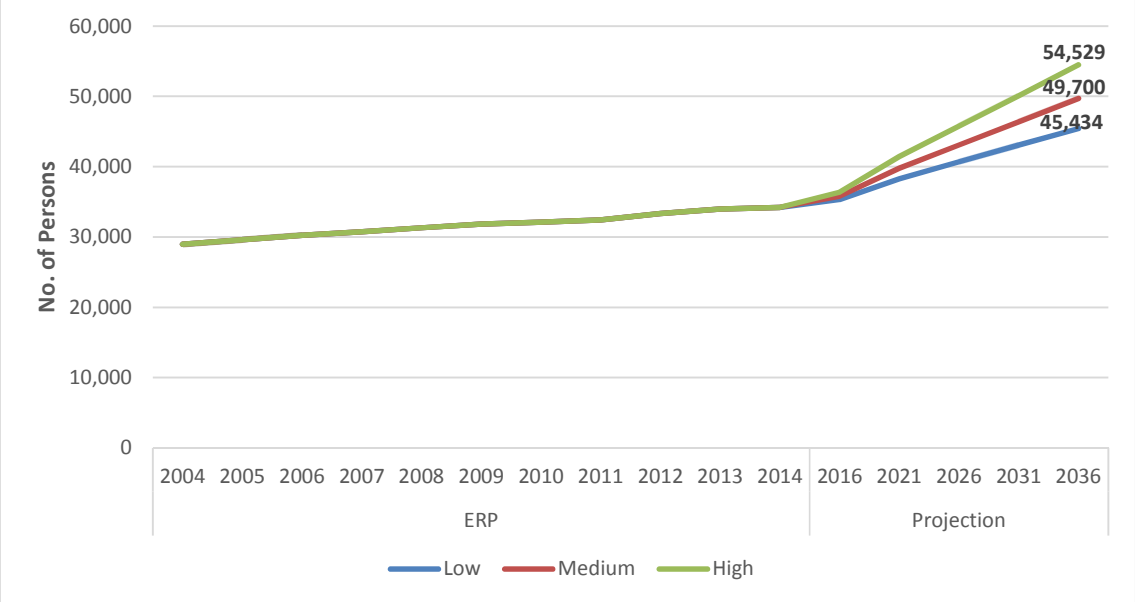
Population projections presented in this chapter are official Queensland Government projections prepared by the Queensland Government Statistician's Office (QGSO).

The population of the Whitsunday RC increased from 30,255 persons in 2004 to 34,211 persons in 2014, or by approximately 1.7% per annum. Between 2014 and 2036, the population of Whitsunday RC is anticipated to increase to:

- Low series: 45,434 persons in 2036, or by approximately 1.3% per annum;
- Medium series: 49,700 persons in 2036, or by approximately 1.7% per annum; and
- High series: 54,529 persons in 2036, or by approximately 2.1% per annum.

Within the projected period, the rate of population growth in Whitsunday RC is projected to be highest between 2016 and 2021 at approximately 1.7% per annum under medium series projections.

Figure 2.1: Estimated Resident Population and Projected Resident Population, Whitsunday RC, 2004 - 2036



Source: Australian Bureau of Statistics *Regional Population Growth, Australia,* Catalogue No. 3218.0, Queensland Government Statistician Population Projections 2013 edition

The population of Bowen SLA is projected to increase from 13,627 persons in 2014 to 19,488 persons in 2036, or by approximately 1.6% per annum.

The working age population (persons aged 15 to 64 years) of Bowen SLA is anticipated to increase from 9,185 persons in 2014 to 12,010 persons in 2036, or by 1.2% per annum. In the Bowen SLA, the working age population is estimated to account for 67.4% of the total population in 2014, but is projected to decrease to 61.6% of the total population by 2031, consistent with the anticipated ageing of the population.

The rate of population growth in the Bowen SLA is anticipated to be marginally below the rate in Whitsunday RC and MIW region, but above the State average.

Table 3.1 shows the population projections for the total and working age populations in Bowen SLA, Whitsunday RC, MIW region and Queensland.

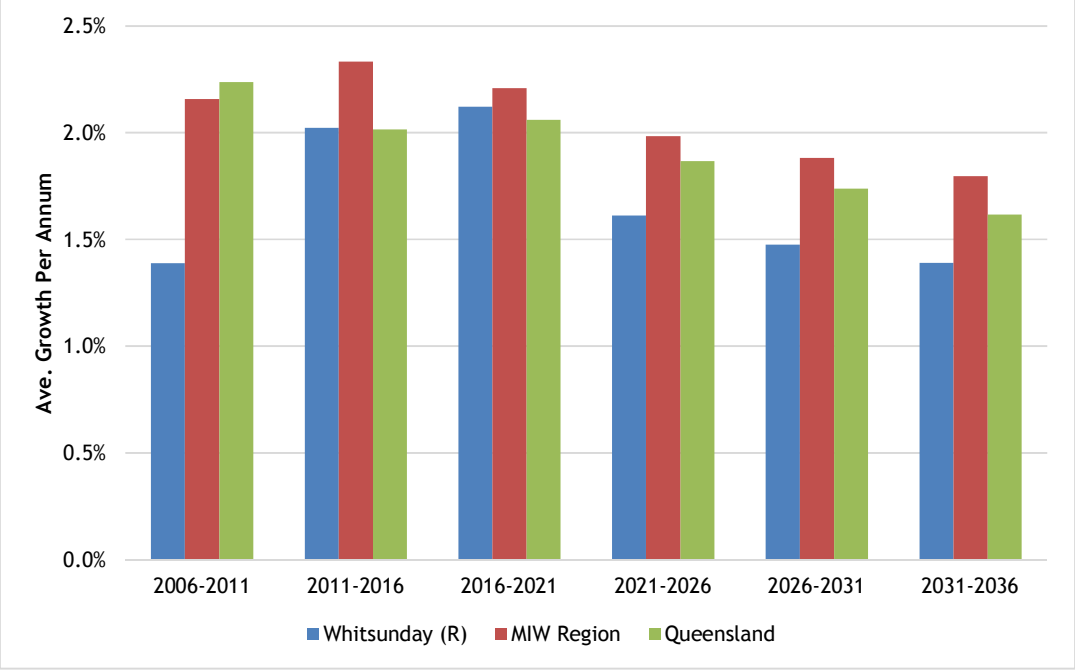
Table 3.1: Population Projections, Bowen SLA, Whitsunday RC, MIW Region and Queensland, 2014 to 2036

	2014	2016	2021	2026	2031	2036	2014-36 Ave. Ann. Growth
Total Population							
Bowen SLA	13,627	14,326	16,038	17,175	18,315	19,488	1.6%
Whitsunday RC	34,211	35,830	39,795	43,106	46,383	49,700	1.7%
MIW Region	182,049	192,529	214,754	236,920	260,074	284,281	2.0%
Queensland	4,722,447	4,946,319	5,477,082	6,007,578	6,548,220	7,095,177	1.9%
15-64 Population							
Bowen SLA	9,185	9,371	10,253	10,778	11,362	12,010	1.2%
Whitsunday RC	23,631	24,494	26,513	28,106	29,851	31,673	1.3%
MIW Region	123,748	106,111	116,497	127,313	139,201	151,967	0.9%
Queensland	3,336,547	3,248,106	3,528,730	3,799,012	4,084,556	4,374,566	1.2%

Source: Australian Bureau of Statistics *Regional Population Growth, Australia*, Catalogue No. 3218.0, Queensland Government Statistician Population Projections 2013 edition and Economic Associates Estimates

The average annual population growth in the Whitsunday RC over this period is projected to be lower than its host region, the MIW region, and for the most part lower than Queensland with the exception of the 2016 to 2021 period.

Figure 3.1: Average Annual Growth - Medium Series, Whitsunday RC, MIW Region and Queensland, Medium Series, 2006 to 2036



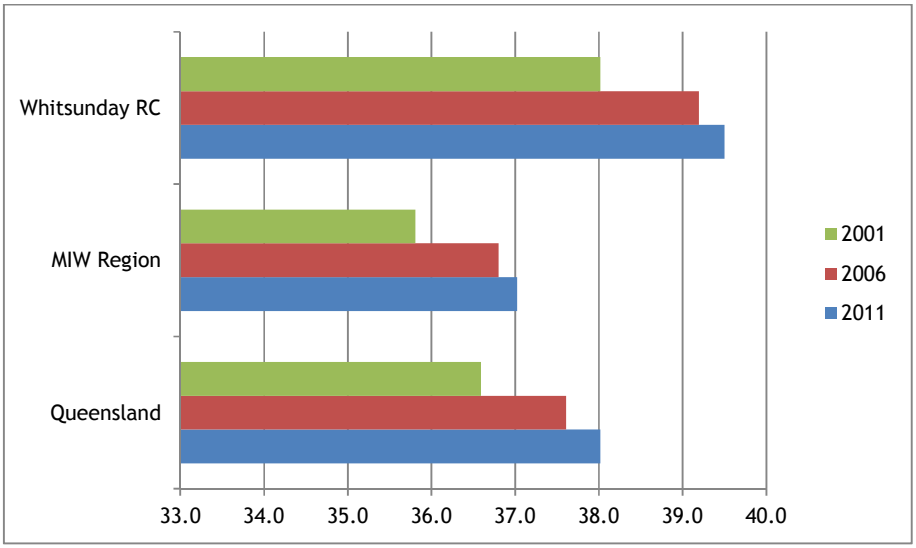
Source: Australian Bureau of Statistics *Regional Population Growth, Australia*, Catalogue No. 3218.0, Queensland Government Statistician Population Projections 2013 edition

3.1.1 Demographic Analysis

Average Age of Residents

The average age of residents in Whitsunday RC increased from 38.0 years in 2001 to 39.5 years in 2011. In the MIW region, the average age of residents increased from 35.8 years in 2001 to 37.0 years in 2011. The average age of residents was consistently higher in the Whitsunday RC than the State average and consistently lower in the MIW region than the State average.

Figure 3.2: Average Age of Residents, Whitsunday RC, MIW Region and Queensland, 2001 to 2011

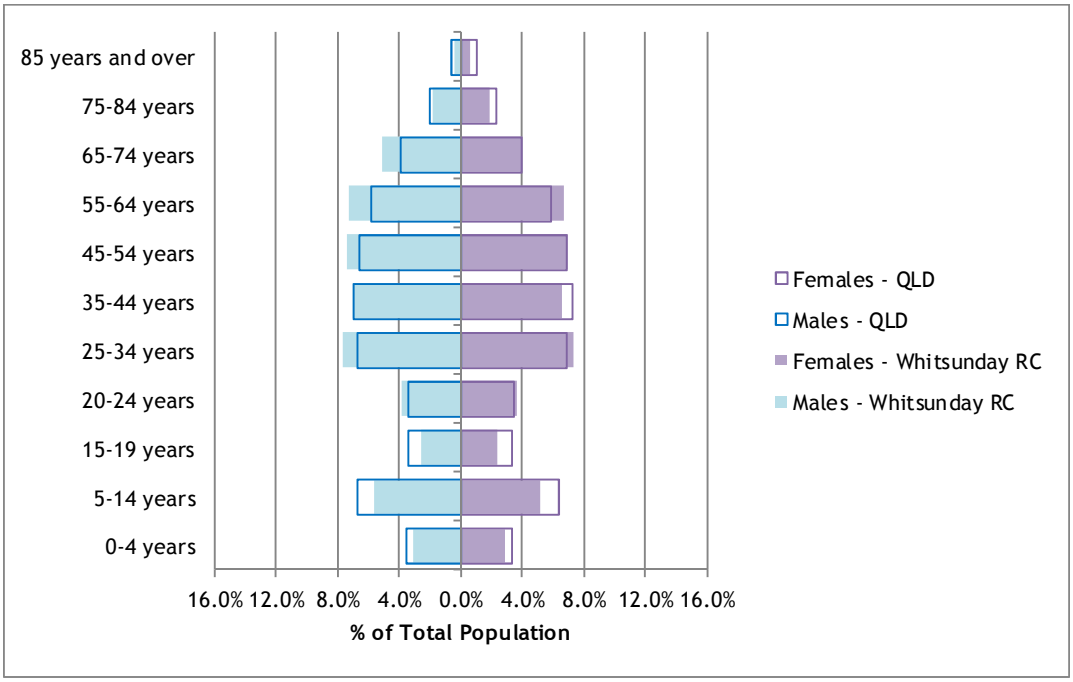


Source: Australian Bureau of Statistics (2012a)

Age Profile

The Whitsunday RC has a slightly older population relative to the Queensland profile and in 2011 recorded a significantly higher proportion of males aged 25 to 34 years and males aged 45 to 74 years and a slightly lower proportion of residents (both male and female aged between 5 and 19 years).

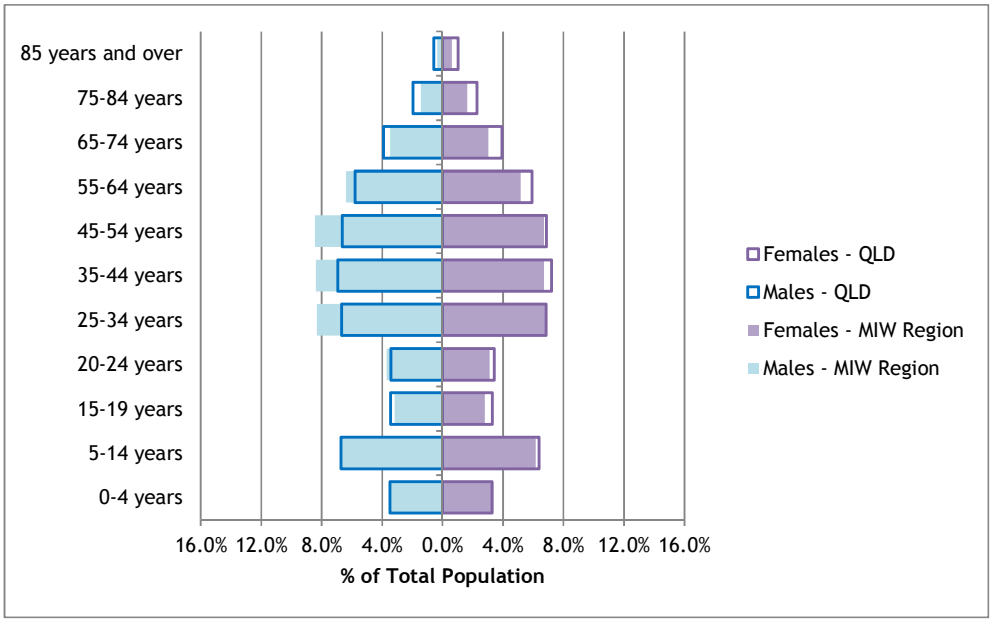
Figure 3.3: Age Profile, Whitsunday RC, 2011



Source: Australian Bureau of Statistics (2012a)

The MIW region recorded a higher proportion of working age men relative to Queensland and in 2011 recorded a significantly higher proportion of males aged 25 to 64 years and a significantly lower proportion of females aged 35 to 44 years and females aged 65 to 74 years and residents (both male and female) aged 75 to 84 years.

Figure 3.4: Age Profile, MIW Region, 2011

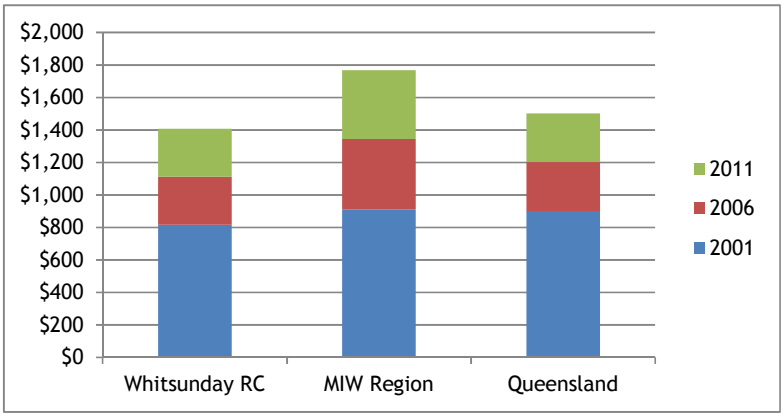


Source: Australian Bureau of Statistics (2012a)

Average Household Income

At a State level, average household income increased from $902 per week in 2001 to $1,501/week in 2011, or by 5.2% per annum. The average household income in the Whitsunday RC increased from $817 per week in 2001 to $1,407 per week in 2011, or by approximately 5.6% per annum (marginally faster than household incomes at the State level). In the MIW region, the average household income increased from $911 per week in 2001 to $1,767 per week in 2011, or by approximately 6.9% per annum- a significantly higher rate of growth than experienced at the State level.

Figure 3.5: Average Household Income, Whitsunday RC, MIW Region and Queensland, 2001 to 2011



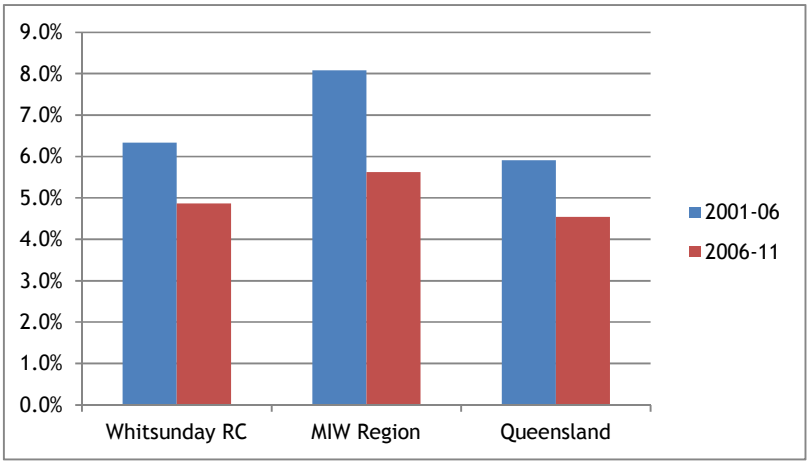
Source: Australian Bureau of Statistics (various years, b)

The average annual growth rate for household income in Whitsunday RC households was:

- 6.3% between 2001 and 2006; and
- 4.9% between 2006 and 2011.

Between 2001 and 2011, the average annual growth rate in average household incomes was higher in Whitsunday RC and the MIW region than Queensland.

Figure 3.6: Average Annual Growth, Average Household Income, Whitsunday RC, MIW Region and Queensland, 2001 to 2011



Source: Australian Bureau of Statistics (various years, b) Industry Analysis

3.2 Industry Analysis

3.2.1 Workforce Size

The size of the labour force in the Bowen SLA increased from 6,298 persons in 2003 to 7,751 persons in 2014, or by approximately 1.9% per annum.

Over the past 11 years, the resident labour force in the Whitsunday RC increased from 15,736 persons in 2003 to 20,587 persons in 2014 or by an average of 2.5% per annum. Year-on-year growth was particularly high in 2004 and 2011.

The MIW Region recorded strong growth in the size of the labour force between 2003 and 2014, increasing from 74,208 persons in 2003 to 108,062 persons in 2014, or by an average of 3.5% over this period.

While the Bowen SLA, Whitsunday RC and MIW region experienced increases in the size of their respective labour forces between 2013 and 2014, the rate of growth is well below historical levels and the rate of growth achieved at the State level over that two year period. This would be representative of a slowing in the regional economies as a result of a softening resources market.

A summary of the labour force size in the Bowen SLA, Whitsunday RC, MIW region and Queensland between 2003 and 2011 is presented in Table 3.2.

Table 3.2: Labour Force, Bowen SLA, Whitsunday RC, MIW Region and Queensland, 2003 to 2014

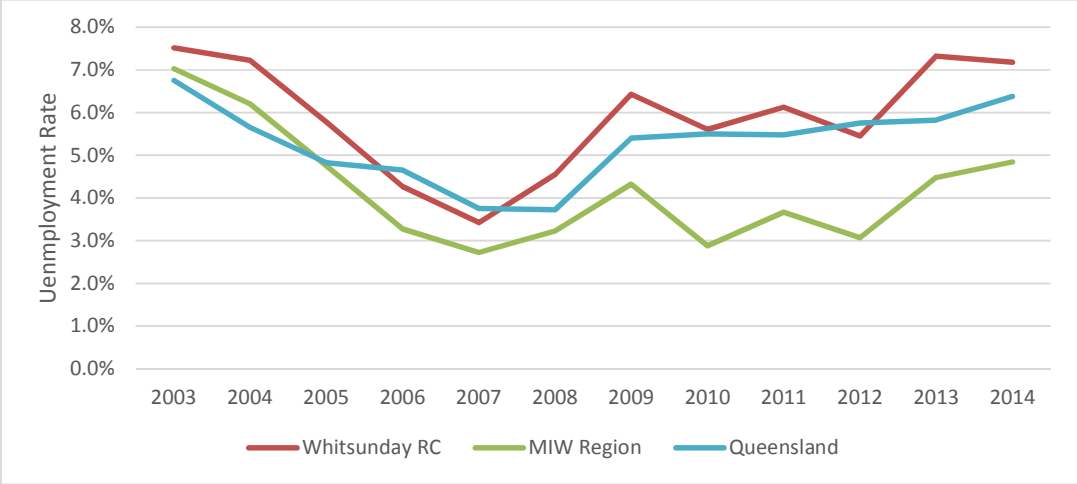
Year	Bowen SLA	Whitsunday RC	MIW Region	Queensland
2003	6,298	15,736	74,208	1,947,763
2004	6,624	16,550	78,047	2,002,970
2005	6,875	17,176	81,003	2,087,206
2006	7,028	17,561	82,813	2,145,507
2007	7,112	17,912	83,797	2,237,987
2008	7,360	18,230	87,907	2,292,384
2009	7,069	18,887	94,856	2,354,420
2010	6,968	19,031	94,601	2,368,484
2011	6,869	20,115	94,935	2,402,357
2012	7,433	19,891	102,434	2,425,670
2013	7,684	20,400	107,149	2,450,395
2014	7,751	20,587	108,062	2,501,339
Ave. growth p.a 2003 to 2014	1.9%	2.5%	3.5%	2.3%
Ave. growth p.a 2013 to 2014	0.9%	0.9%	0.9%	2.1%

Source: Department of Employment (various years)

3.2.2 Unemployment

Between 2003 and 2007, all regions within the study area recorded a significant decline in the unemployment rate, consistent with strong economic conditions throughout Queensland during this period. Between 2007 and 2009, the Whitsunday RC and the MIW region both recorded increases in the unemployment rate, although the unemployment rate in the MIW region remained below the State average since 2005. Unemployment in the Whitsunday RC generally remains above the State average.

Figure 3.7: Unemployment Rate, Whitsunday RC, MIW Region and QLD, 2003-2014



Source: Department of Employment (various years)

Unemployment in the Bowen SLA decreased from 9.2% in 2003 to 5.8% in 2012 and was lowest in 2010 at 4.8%. The unemployment rate in the Bowen SLA was consistently above the rate in the Whitsunday RC, the MIW region and Queensland between 2003 and 2010.

The unemployment rates in Bowen SLA, Whitsunday RC, MIW region and Queensland between 2003 and 2014 are summarised in Table 3.3.

Table 3.3: Unemployment Rate, Bowen SLA, Whitsunday RC, MIW Region and Queensland, 2003 to 2014

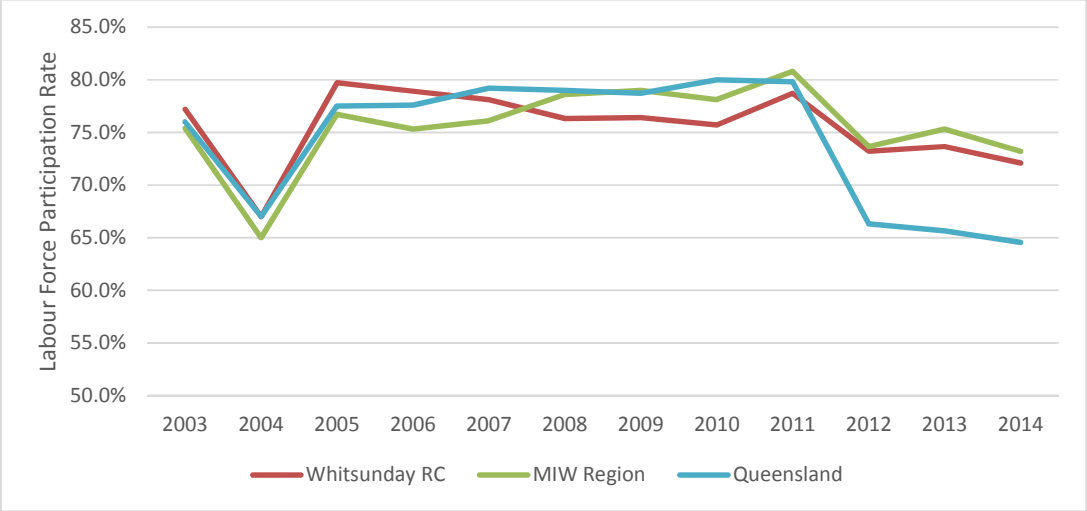
Year	Bowen SLA	Whitsunday RC	MIW Region	Queensland
2003	9.2%	7.5%	7.0%	6.8%
2004	9.0%	7.2%	6.2%	5.7%
2005	7.6%	5.8%	4.8%	4.8%
2006	5.9%	4.3%	3.3%	4.7%
2007	4.9%	3.4%	2.7%	3.8%
2008	6.3%	4.6%	3.2%	3.7%
2009	8.2%	6.4%	4.3%	5.4%
2010	4.8%	5.6%	2.9%	5.5%
2011	6.5%	6.1%	3.7%	5.5%
2012	5.8%	5.5%	3.1%	5.8%
2013	8.8%	7.3%	4.5%	5.8%
2014	8.4%	7.2%	4.8%	6.4%

Note: The average annual change figures in this table represent the average annual percentage point change in the unemployment rate.
Source: Department of Employment (various years)

3.2.3 Labour Force Participation

The labour force participation rate in the MIW region has followed a similar trend to Queensland. Labour force participation in the Whitsunday RC has trended downwards since 2005 with an uplift recorded in 2011. Labour force participation declined sharply after 2011, although the decline in labour force participation within the Whitsunday RC and MIW region was significantly less than that experienced State wide.

Figure 3.8: Labour Force Participation Rate, Whitsunday RC, MIW Region and QLD, 2003-2014



Source: Department of Employment tions (various years)

The average labour force participation rate between 2003 and 2014 was 76.8% in Bowen SLA, above the average in the Whitsunday RC (75.6%), the MIW region (75.6%) and Queensland (74.3%). Bowen SLA has generally maintained a high level of labour force participation compared with regional and State benchmarks. Between 2012 and 2013, labour force participation within Bowen SLA increased while participation decreased across regional and state benchmarks. In 2014, labour force participation within Bowen SLA continued to be well above regional benchmarks and the Queensland average.

The labour force participation rate in the Bowen SLA, Whitsunday RC, MIW region and Queensland between 2003 and 2014 are summarised in Table 3.4.

Table 3.4: Labour Force Participation Rate, Bowen SLA, Whitsunday RC, MIW Region and Queensland, 2003 to 2014

Year	Bowen SLA	Whitsunday RC	MIW Region	Queensland
2003	75.6%	77.2%	75.4%	76.0%
2004	68.4%	67.0%	65.0%	67.0%
2005	80.6%	79.7%	76.7%	77.5%
2006	80.5%	78.9%	75.3%	77.6%
2007	78.5%	78.1%	76.1%	79.2%
2008	73.4%	76.3%	78.6%	79.0%
2009	73.0%	76.4%	79.0%	78.7%
2010	72.3%	75.7%	78.1%	80.0%
2011	75.1%	78.7%	80.8%	79.8%
2012	80.3%	73.2%	73.7%	66.3%
2013	82.1%	73.6%	75.3%	65.7%
2014	81.8%	72.1%	73.2%	64.5%
Average	76.8%	75.6%	75.6%	74.3%

Source: Department of Employment (various years), Australian Bureau of Statistics

3.2.4 Enterprise Activity

The latest edition of the ABS Counts of Australian Businesses publication presents business count estimates by industry at the Statistical Area Level 2 (SA2) level[7], as opposed to the SLA level as in previous editions.

The regions have been defined by SA2 boundaries as follows:

- Whitsunday RC: Bowen, Collinsville, Airlie – Whitsunday, Cape Conway and Proserpine SA2s; and
- MIW region: Airlie – Whitsundays, Andergrove – Beaconsfield, Bowen, Broadsound – Nebo, Cape Conway, Clermont, Collinsville, East Mackay, Eimeo – Rural View, Mackay, Mackay Harbour, Moranbah, Mount Pleasant – Glenella, North Mackay, Ooralea – Bakers Creek, Pioneer Valley, Proserpine, Sarina, Seaforth – Calen, Shoal Point – Bucasia, Slade Point, South Mackay, Walkerston – Eton and West Mackay SA2s.

This section reports the number of businesses by industry registered within the Whitsunday RC and the MIW region. Significant business activity in the region(s) is undertaken by enterprises registered outside the region(s). This business register data provides an indication of the number and capability of locally based businesses.

Whitsunday RC

As of June 2014, there was an estimated 3,562 registered businesses in the Whitsunday RC, with an estimated 59.2% owned by sole operators. Approximately 17.8% of all registered businesses were classified in the construction sector (634 businesses), with agriculture, forestry and fishing (573 businesses), rental, hiring and real estate services (497 businesses) also significant industries. There were no businesses in the Whitsunday RC that recorded employment of 200 or more workers as of June 2014.

Table 3.5 summarises the number of businesses by industry sector within the Whitsunday RC as at June 2014.

Table 3.5: Counts of Australian Businesses, Whitsunday RC, June 2011

Industry Sectors	Employing Businesses				Total Non-Employing	Total Businesses
	1-19	20-199	200+	Total Employing		
Agriculture, Forestry and Fishing	26.4%	4.7%	0.0%	31.1%	68.9%	573
Mining	47.4%	0.0%	0.0%	47.4%	52.6%	19
Manufacturing	53.4%	2.5%	0.0%	55.9%	44.1%	118
Electricity, Gas, Water and Waste Services	0.0%	0.0%	0.0%	0.0%	0.0%	0
Construction	46.1%	1.1%	0.0%	47.2%	52.8%	634
Wholesale Trade	40.8%	0.0%	0.0%	40.8%	59.2%	76
Retail Trade	56.3%	6.1%	0.0%	62.4%	37.6%	213
Accommodation and Food Services	61.5%	8.7%	0.0%	70.2%	29.8%	208
Transport, Postal and Warehousing	39.7%	7.7%	0.0%	47.4%	52.6%	234
Information Media and Telecommunications	47.4%	0.0%	0.0%	47.4%	52.6%	19
Financial and Insurance Services	12.2%	0.0%	0.0%	12.2%	87.8%	180
Rental, Hiring and Real Estate Services	14.5%	1.6%	0.0%	16.1%	83.9%	497
Professional, Scientific and Technical Services	42.5%	3.2%	0.0%	45.7%	54.3%	219
Administrative and Support Services	48.3%	4.2%	0.0%	52.4%	47.6%	143
Public Administration and Safety	60.0%	20.0%	0.0%	80.0%	20.0%	15
Education and Training	38.2%	0.0%	0.0%	38.2%	61.8%	34
Health Care and Social Assistance	39.8%	5.6%	0.0%	45.4%	54.6%	108

[7] In urban areas, SA2s usually conform to whole suburbs/combinations of whole suburbs. In rural areas, SA2 boundaries represent functional zones of social and economics links.

Industry Sectors	Employing Businesses				Total Non-Employing	Total Businesses
	1-19	20-199	200+	Total Employing		
Arts and Recreation Services	37.5%	0.0%	0.0%	37.5%	62.5%	32
Other Services	50.6%	1.7%	0.0%	52.2%	47.8%	178
Not Classified	25.8%	0.0%	0.0%	25.8%	74.2%	62
Total	**37.5%**	**3.3%**	**0.0%**	**40.8%**	**59.2%**	**3,562**

Source: Australian Bureau of Statistics (2014)

MIW Region

Within the MIW region, there were an estimated 14,078 registered businesses as of June 2014, with an estimated 40.5% of all businesses being owned by sole operators. The most common business types (in terms of number of businesses) in the MIW region were agriculture, forestry and fishing (3,017 businesses), construction (2,562 businesses) and rental, hiring and real estate services (1,517 businesses). The manufacturing sector recorded the only incidence of businesses with 200 or more employees.

Table 3.6 summarises the number of businesses by industry sector within the MIW Region as at June 2014.

Table 3.6: Counts of Australian Businesses, MIW Region, June 2014

Industry Sectors	Employing Businesses				Total Non-Employing	Total Businesses
	1-19	20-199	200+	Total Employing		
Agriculture, Forestry and Fishing	24.6%	1.2%	0.0%	25.8%	74.2%	3,017
Mining	45.4%	8.6%	0.0%	54.0%	46.0%	163
Manufacturing	53.0%	4.8%	0.7%	58.5%	41.5%	436
Electricity, Gas, Water and Waste Services	37.5%	0.0%	0.0%	37.5%	62.5%	24
Construction	45.5%	2.3%	0.0%	47.7%	52.3%	2,562
Wholesale Trade	39.8%	5.4%	0.0%	45.2%	54.8%	279
Retail Trade	53.5%	7.1%	0.0%	60.6%	39.4%	647
Accommodation and Food Services	62.3%	9.9%	0.0%	72.2%	27.8%	515
Transport, Postal and Warehousing	37.4%	4.4%	0.0%	41.8%	58.2%	904
Information Media and Telecommunications	39.1%	0.0%	0.0%	39.1%	60.9%	46
Financial and Insurance Services	17.0%	0.0%	0.0%	17.0%	83.0%	617
Rental, Hiring and Real Estate Services	16.3%	1.3%	0.0%	17.5%	82.5%	1,517
Professional, Scientific and Technical Services	43.6%	3.1%	0.0%	46.7%	53.3%	860
Administrative and Support Services	47.1%	5.9%	0.0%	53.1%	46.9%	471
Public Administration and Safety	42.9%	28.6%	0.0%	71.4%	28.6%	42
Education and Training	43.6%	3.7%	0.0%	47.2%	52.8%	163
Health Care and Social Assistance	45.8%	5.8%	0.0%	51.5%	48.5%	518
Arts and Recreation Services	29.0%	6.5%	0.0%	35.5%	64.5%	93
Other Services	55.5%	2.5%	0.0%	58.0%	42.0%	938
Not Classified	32.3%	0.0%	0.0%	32.3%	67.7%	266
Total	**37.4%**	**3.1%**	**0.0%**	**40.5%**	**59.5%**	**14,078**

Source: Australian Bureau of Statistics (2014)

Regional Comparison

Both the Whitsunday RC and the MIW region have a higher proportion of registered businesses within the agriculture, forestry and fishing sector. The Whitsunday RC also recorded a significantly higher proportion of rental, hiring and real estate businesses than the MIW region and Queensland. There was also notably a lower incidence of professional, scientific and technical services businesses within both Whitsunday RC and the MIW region than Queensland.

While the MIW region recorded a similar incidence of construction businesses to the State average, the Whitsunday RC had a significantly lower incidence of businesses within this sector.

Table 3.7 provides a comparative summary of the number of businesses by industry sector for each region.

Table 3.7: Total Businesses by Industry Sector, Regional Comparison, June 2014

Industry Sectors	Whitsunday RC	MIW Region	Queensland
Agriculture, Forestry &Fishing	16.1%	21.4%	10.2%
Mining	0.5%	1.2%	0.5%
Manufacturing	3.3%	3.1%	4.0%
Electricity, Gas, Water & Waste Services	0.0%	0.2%	0.3%
Construction	17.8%	18.2%	17.1%
Wholesale Trade	2.1%	2.0%	3.2%
Retail Trade	6.0%	4.6%	6.2%
Accommodation & Food Services	5.8%	3.7%	3.9%
Transport, Postal & Warehousing	6.6%	6.4%	5.9%
Information Media & Telecommunications	0.5%	0.3%	0.7%
Financial & Insurance Services	5.1%	4.4%	7.5%
Rental, Hiring &Real Estate Services	14.0%	10.8%	11.5%
Professional, Scientific & Technical Services	6.1%	6.1%	10.8%
Administrative &Support Services	4.0%	3.3%	3.8%
Public Administration & Safety	0.4%	0.3%	0.3%
Education & Training	1.0%	1.2%	1.3%
Health Care & Social Assistance	3.0%	3.7%	5.2%
Arts & Recreation Services	0.9%	0.7%	1.2%
Other Services	5.0%	6.7%	4.6%
Not Classified	1.7%	1.9%	2.1%
Total	**3,562**	**14,078**	**416,727**

Source: Australian Bureau of Statistics (2014)

3.2.5 Development Pipeline

As at June 2015, there were three coal and two energy projects identified for development in the Whitsunday RC. In the reminder of the MIW region there were 16 coal, mineral and other projects, including (Table 3.8):

- 13 coal projects;
- 1 mineral project; and
- 2 other projects (transport infrastructure).

In the Whitsunday RC, the most significant new project in terms of estimated capital expenditure was the Byerwen open cut mine. This mine project has an estimated capital expenditure of $2,000 million and an estimated workforce of 350 workers during the construction phase and 545 workers during operations.

Across the remainder of the broader MIW region, the most significant projects in terms of estimated capital expenditure were:

- Carmichael coal mine and rail: This project has a total estimated capital expenditure of $6,000 million and an estimated workforce of 2,500 workers during construction and 3,825 workers during operations; and
- Grosvenor underground mine: This project is committed with an estimated capital expenditure of $2,000 million. The workforce of the project is estimated at 500 workers during the construction phase and 485 workers during the operational phase.

Table 3.8: Development Pipeline, June 2015

Projects	Company	Status	Proposed Start Up	Est. Capital Expenditure ($m)	Employment	New Capacity (Total)
Whitsunday RC						
Coal Projects						
Drake	Drake Coal Pty Ltd	Committed	early production	350	350 (op)	6 Mtpa coking and thermal
Jax open-cut	QCoal Ltd	Committed	under care and maintenance	100	100 (op)	1.8 Mt (ROM) coking
Byerwen open-cut	Qcoal Ltd	Under study	2016	2,000	350 (con) 545 (op)	10 Mt hard coking and thermal
Energy Projects						
Bowen Gas Project	Arrow Energy Pty Ltd	Under study	2017	n.a	n.a	6,600 wells
Arrow Bowen Gas Pipeline	Arrow Energy Ltd	Under study	2017	1,000	650 (con) 10 (op)	600km gas pipeline
Rest of MIW Region						
Coal Projects						
Eaglefield Mine Expansion	Peabody Energy Australia	Under study	n.a	n.a	650 (op)	Exptend mine life 22 yrs
Kevin's Corner	GVK Resources	Under study	n.a	n.a	2,500 (con) 1,600 to 1,800 (op)	30 Mtpa thermal
Alpha	Hancock Coal	On hold	n.a	n.a	1,060 (con) 2,300 (op)	32 Mtpa thermal
China Stone Coal Project	Macmines Austraisa Pty Ltd	Under study	2017	6,000	3,900 (con) 3,400 (op)	60 Mtpa (ROM) thermal
North Goonyella underground mine expansion	Peabody Energy Ltd	Under construction	n.a	150	n.a	Up to 5 Mt coking
Grosvenor West Project	Carabella Resources Ltd	Under study	2015	500	n.a	3.5 Mtpa
Grosvenor Underground	Anglo American Metallurgical Coal Ltd	Under construction	2015	2,000	500 (con) 485 (op)	5 Mt hard coking (Stage 1)
Ellensfield Coal Mine Project	Ellensfield Coal Management Pty Ltd	Committed	2019	800	460 (con) 340 (op)	5.5 Mt coking and thermal
New Lenton Coal Project	New Hope Coal Pty Ltd	Under study	n.a	580	400 (op)	3.5 Mt coking & thermal
Eagle Downs Coal Mine Project	Eagle Downs Coal Management Pty Ltd	Under construction	2021	1,000	500 (con) 410 (op)	4.5 Mt hard coking (Stage 1)
Carmichael Coal Mine and Rail	Adani Mining Ltd	Committed	2018	6,000	2,500 (con) 3,825 (op)	Up to 60 Mt thermal
Red Hill Mining Lease	BHP Billiton Mitsubishi Alliance	Under study	2018	n.a	2,000 (con) 1,500 (op)	Up to 14 Mt hard coking
Moranbah South underground	Anglo American Metallurgical Coal Pty Ltd	Committed	n.a	n.a	878 (con) 1,314 (op)	Up to 18 Mt (ROM) coking
Mineral Projects						
Anthony Molybdenum open-cut	Zamia Metals Ltd	Under study	n.a	200	n.a	5 Mtpa molybdenum ore

Projects	Company	Status	Proposed Start Up	Est. Capital Expenditure ($m)	Employment	New Capacity (Total)
Other						
Central Queensland Integrated Rail	Aurizon	Under study	2015-2017	2,000	2,500 (con) 800 (op)	n.a
North Galilee Basin Rail	Adani Mining Ltd	Committed	n.a	3,000	2,017 (con) 369 (op)	n.a

Source: Department of State Development (2015)
Note: con- construction workforce, op- operational workforce, mtpa – million tonnes per annum, n.a- not available,

3.3 Gross Regional Product

In the MIW region, total gross regional product (GRP) was estimated at $15,176 million in 2009-10, accounting for 7.3% of Queensland gross State product (GSP). In the MIW region, the most significant sectors were:

- Mining: GRP of $8,020 million, accounting for 52.8% of GRP in the MIW region and 35.3% of Queensland GSP;
- Construction: GRP of $1,049 million, accounting for 6.9% of GRP in the MIW region and 5.2% of Queensland GSP; and
- Transport, postal and warehousing: GRP of $895 million, accounting for 5.9% of GRP in the MIW region and 5.9% of Queensland GSP.

Table 3.9 below reports GRP estimates for the MIW region.

Table 3.9: Gross Regional Product at Factor Cost, MIW Region, 2009-10

	Value ($m)	% of Total	MIW GRP as % of QLD
Agriculture, Forestry and Fishing	484	3.2%	7.2%
Mining	8,020	52.8%	35.3%
Manufacturing	756	5.0%	3.8%
Electricity, Gas, Water and Waste Services	95	0.6%	1.7%
Construction	1,049	6.9%	5.2%
Wholesale Trade	634	4.2%	5.3%
Retail Trade	574	3.8%	4.6%
Accommodation and Food Services	230	1.5%	3.9%
Transport, Postal and Warehousing	895	5.9%	5.9%
Information Media and Telecommunications	132	0.9%	2.6%
Financial and Insurance Services	227	1.5%	1.4%
Rental, Hiring and Real Estate Services	192	1.3%	3.9%
Professional, Scientific and Technical Services	535	3.5%	3.8%
Administrative and Support Services	113	0.7%	2.6%
Public Administration and Safety	286	1.9%	2.3%
Education and Training	271	1.8%	2.7%
Health Care and Social Assistance	390	2.6%	2.7%
Arts and Recreation Services	17	0.1%	1.1%
Other Services	276	1.8%	6.3%
Total	**15,176**	**100.0%**	**7.3%**

Note: GRP estimates are at current prices
Source: Office of Economic and Statistical Research (2011a), Economic Associates estimates

3.4 Regional Competitive Advantage

Economic opportunities emerge from the presence of regional resources and capabilities that provide prospective industries with a locational advantage. The absence of suitable regional resources and capabilities for specific types of industries will limit their development and sustainability. Attempts to establish industry sectors within a regional economy that do not have access to the requisite resources and capabilities are likely to result in an inefficient allocation of regional resources and capabilities. This is not to say regions cannot transition or diversify by augmenting or adding to regional resources and capabilities (dynamic competitive advantage versus static competitive advantage).

Regional economies evolve over time as key centres establish themselves as regional, State or national hubs of commerce or specialised economic activities. Hence, State or national hubs

typically tend to possess regional competitive advantages in higher order economic activities (i.e. quinary and quaternary industries), while rural and regional centres typically possess advantages in primary or secondary industries. Regional economies can partly insulate themselves from the economic cycle by diversifying their economic bases. However, diversification of an economic base must be supported by the region's endowment (or evolving endowment through dynamic competitive advantage) of resources and capabilities to maintain allocative efficiency within the regional economy.

Figure 3.9 below illustrates the range of economic structures from one with significant competitive advantages in primary production to one which possesses a significant competitive advantage in quinary industry activities (e.g. health, community and cultural services).

Figure 3.9: Regional Economic Structures based on Regional Competitive Advantages across Industry Sectors

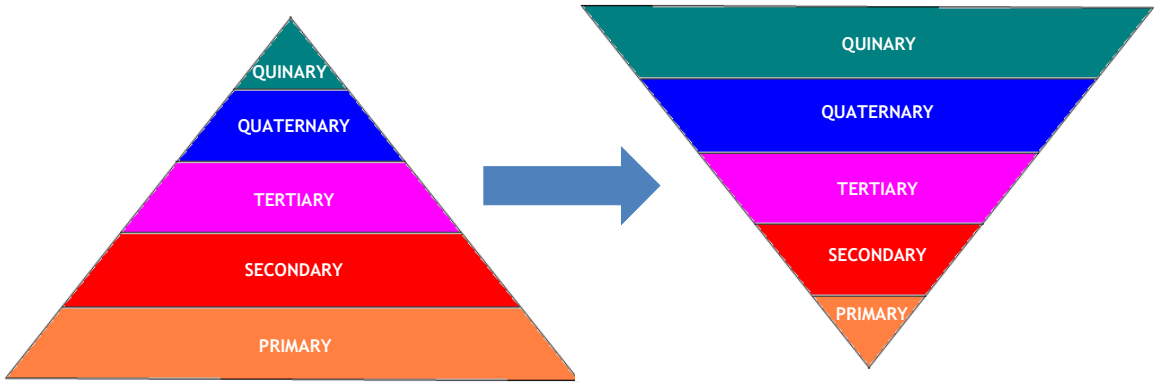


Table 3.10 below summarises the classification of industry sectors to broad industry categories (e.g. primary, secondary, tertiary, quaternary and quinary industry).

Table 3.10: Sectors by Industry Categories

Primary	Secondary	Tertiary	Quaternary	Quinary
• Agriculture, Forestry & Fishing • Mining	• Construction • Electricity, Gas, Water & Waste Services • Manufacturing	• Accommodation & Food Services • Retail • Transport, Postal & Warehousing • Wholesale Trade	• Administration & Support Services • Education & Training • Financial & Insurance Services • Professional, Scientific & Technical Services • Public Administration & Safety • Rental, Hiring & Real Estate Services	• Arts & Recreation Services • Health Care & Social Assistance • Information & Communication Technology • Other services

3.4.1 Working Population Profile

The working population of the Bowen SLA increased from 5,434 persons in 2006 to 5,528 persons in 2011, or by approximately 1.7% (Table 3.11). Between 2006 and 2011, the rental, hiring and real estate and mining sectors recorded the largest increase in employment, with significant decreases recorded within the wholesale trade and agriculture, forestry and fishing

sectors The working population of the Whitsunday RC increased significantly from 9,628 persons in 2006 to 13,925 persons in 2011, or by approximately 44.6%.

Table 3.11: Working Population Profile Bowen SLA and Whitsunday RC, 2006 and 2011

	Bowen SLA			Whitsunday RC		
	2006	2011	% Change 2006 to 2011	2006	2011	% Change 2006 to 2011
Agriculture, forestry and fishing	1,143	755	-33.9%	1,416	1,174	-17.1%
Mining	609	884	45.2%	615	922	49.9%
Manufacturing	278	250	-10.1%	718	815	13.5%
Electricity, gas, water and waste services	83	78	-6.0%	118	137	16.1%
Construction	438	510	16.4%	1,094	1,221	11.6%
Wholesale trade	193	127	-34.2%	301	327	8.6%
Retail trade	528	485	-8.1%	932	1,534	64.6%
Accommodation and food services	355	418	17.7%	1,266	2,218	75.2%
Transport, postal and warehousing	292	349	19.5%	684	1,070	56.4%
Information media and telecommunications	30	31	3.3%	54	82	51.9%
Financial and insurance services	55	52	-5.5%	91	169	85.7%
Rental, hiring and real estate services	46	89	93.5%	158	283	79.1%
Professional, scientific and technical services	118	134	13.6%	254	465	83.1%
Administrative and support services	109	134	22.9%	239	488	104.2%
Public administration and safety	197	214	8.6%	360	502	39.4%
Education and training	324	307	-5.2%	399	729	82.7%
Health care and social assistance	416	457	9.9%	476	1,010	112.2%
Arts and recreation services	21	17	-19.0%	74	125	68.9%
Other services	136	168	23.5%	255	477	87.1%
Inadequately described/Not stated	63	69	9.5%	124	177	42.7%
Total	**5,434**	**5,528**	**1.7%**	**9,628**	**13,925**	**44.6%**

Source: Australian Bureau of Statistics Census of Population and Housing (2006, 2011)

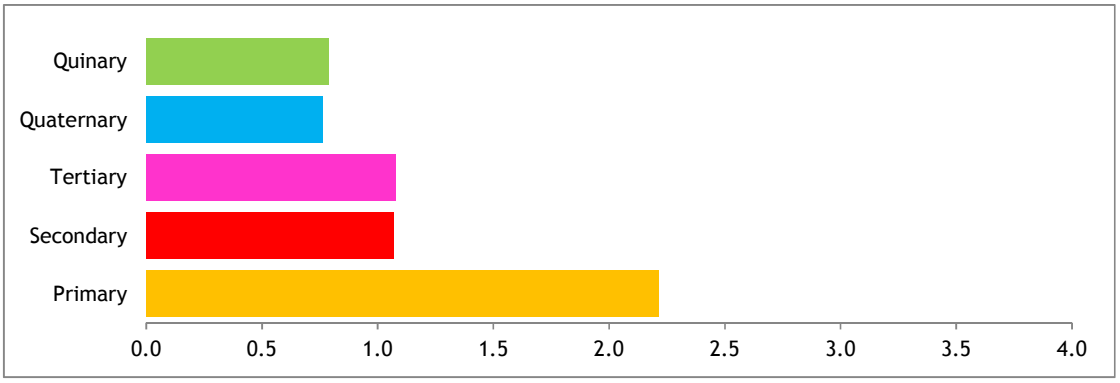
3.4.2 Location Quotient Analysis

The location quotient analysis is provided for the resident population of the MIW region. Location quotients express the relationship between employment in a specific industry in a region relative to employment in the same industry at a State or national level. If the location quotient is greater than one, it represents a regional competitive advantage.

In 2011-12, the MIW region had a competitive advantage in primary industries relative to Queensland, recording a location quotient of 2.21 (Figure 3.10). However, the competitive advantage in primary industries in the Mackay Fitzroy Central West region is declining, with employment growth in the agriculture, forestry and fishing and mining sectors falling below the State average between 2006 and 2011.

The MIW region also has a marginal competitive advantage in secondary and tertiary industries relative to Queensland. The secondary sector of construction has recorded higher employment growth than the State average, thus improving its regional competitive advantage in this sector. All tertiary sectors, with the exception of accommodation and food services recorded higher employment growth in the MIW region than the State average.

Figure 3.10: Location Quotient Analysis, MIW region, 2011-12

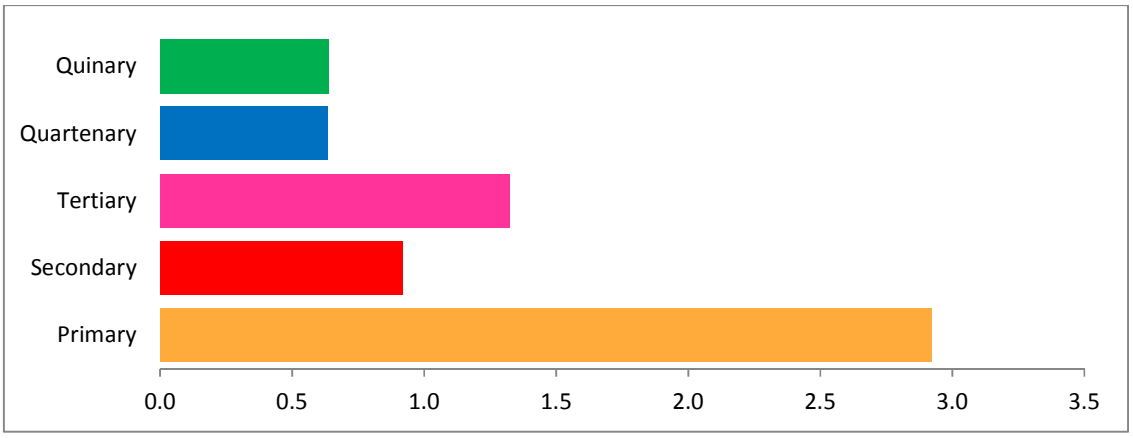


Source: Australian Bureau of Statistics (2012e)

To provide an overview of labour force characteristics at a more local level, 2011 Census employment by industry data has been analysed for the resident population of the Whitsunday RC and the MIW region.

The Whitsunday RC recorded a competitive advantage for primary industries relative to Queensland and also had a marginal competitive advantage for tertiary industries (Figure 3.11).

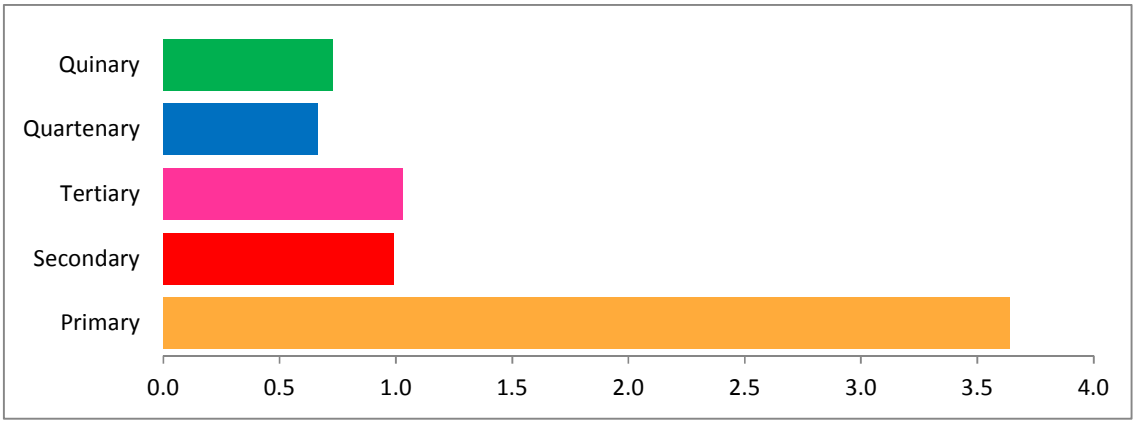
Figure 3.11: Location Quotient Analysis, Whitsunday RC, 2011



Source: Australian Bureau of Statistics (2011)

The MIW region recorded a significant competitive advantage for primary industries relative to Queensland and also a marginal competitive advantage for tertiary industries (Figure 3.12).

Figure 3.12: Location Quotient Analysis, MIW Region, 2011



Source: Australian Bureau of Statistics (2011)

3.4.3 Regional Growth Prospects

The Whitsunday RC and MIW region are likely to experience continued growth and competitive advantage within the primary sector. Growth in the primary sector is likely to be driven by the mining sector with a number of mining projects in the development pipeline (refer to section 3.2.5). The agriculture, forestry and fishing sector recorded a decline in the working population between 2006 and 2011; this trend is anticipated to continue with a decline although at a slower rate.

3.5 Local & Regional Property Markets

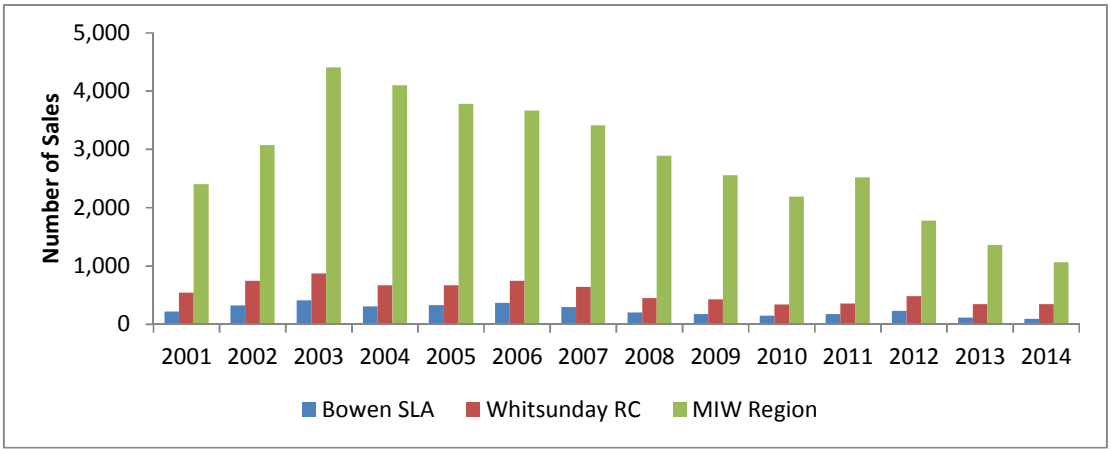
An analysis of local and regional property markets is provided below to provide context as to the extent and velocity of sales activity within the host region. Generally, there has been a softening of sales activity and prices across local and regional property markets, indicating a slackening of demand.

3.5.1 Residential Property Market

Volume of House Sales

In the MIW region, the volume of house sales fluctuated significantly between 2001 and 2014, peaking in 2003 with 4,404 sales (Figure 3.13). The number of house sales in the MIW region has continually trended downwards since 2003. In the Bowen SLA, the volume of house sales peaked at 415 sales (in 2003) but had dropped to 94 sales by 2014. The volume of house sales in the Bowen SLA accounted for between 27% (in 2014) and 49% (in 2006) of sales in the Whitsunday RC between 2001 and 2014.

Figure 3.13: Volume of House Sales, Bowen SLA, Whitsunday RC and MIW Region, 2001 to 2014



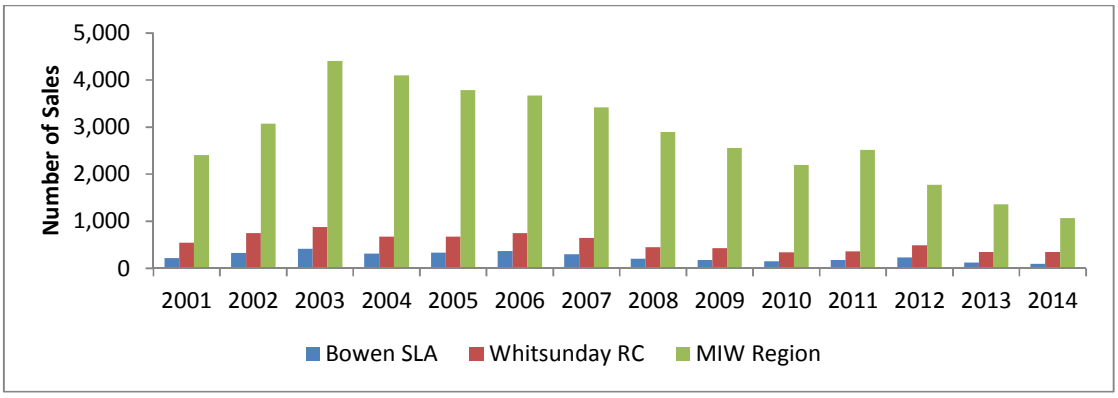
Note: The data was collected in June 2015
Source: Property Finder (2015)

Median House Sale Price

The median sale price of houses in the MIW region increased from $125,000 in 2001 to $430,000 in 2012 before decreasing to $391,000 in 2014 (Figure 3.14). The average annual growth rate of the median sale price of houses was highest between 2003 and 2006.

In the Bowen SLA, the median sale price of houses increased from $67,500 in 2001 to $350,000 in 2009 before decreasing to $260,000 in 2011. In 2014 the median house price had increased again to $348,750. The median sale price of houses was consistently lower in Bowen SLA than in Whitsunday RC and MIW region.

Figure 3.14: Median Sale Price, Houses, Bowen SLA, Whitsunday RC and MIW Region, 2001 to 2014



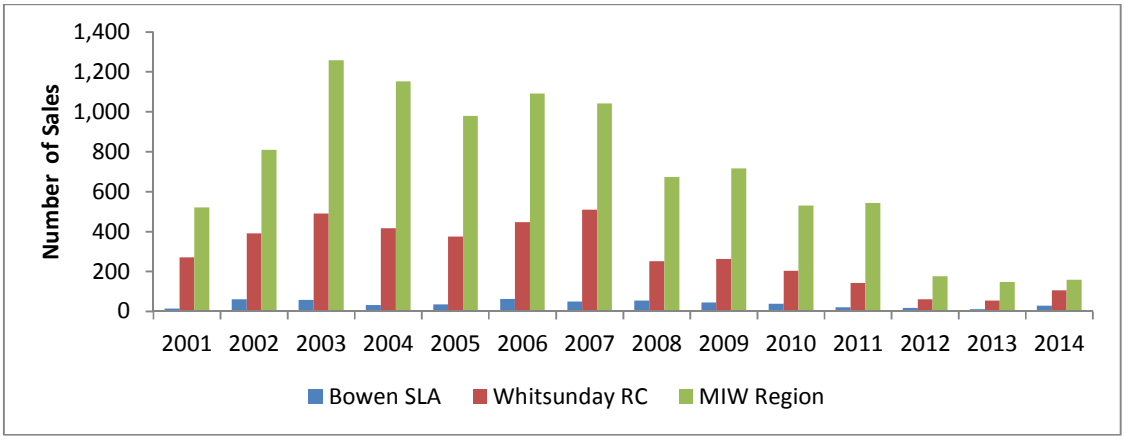
Note: The data was collected in June 2015
Source: Price Finder (2015)

Unit & Townhouse Volume of Sales

The volume of unit and townhouse sales in the MIW region ranged between 522 sales (2001) and peaked at 1,258 sales in 2003 (Figure 3.15).

In the Bowen SLA, the volume of unit and townhouse sales reached as high as 62 sales in 2011, but had dropped to 11 sales in 2013. The volume of unit and townhouse sales in the Bowen SLA accounted for between 6% and 30% of sales in the Whitsunday RC between 2001 and 2014.

Figure 3.15: Volume of Unit and Townhouse Sales, Bowen SLA, Whitsunday RC and MIW Region, 2001 to 2014

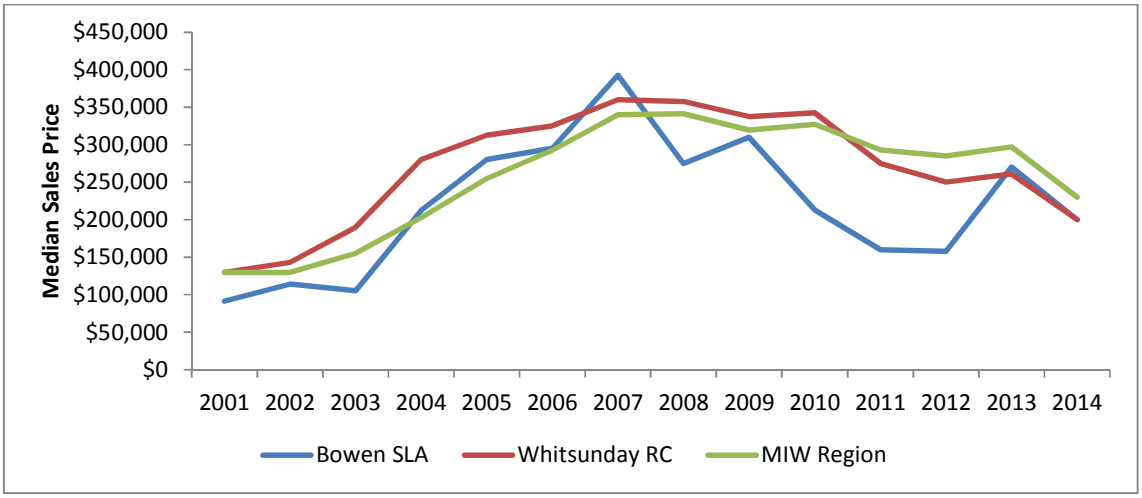


Note: The data was collected in June 2015
Source: Price Finder (2015)

Median Sale Price for Units & Townhouses

The median sales price of units and townhouses in the MIW region increased from $130,000 in 2001 to $340,000 in 2007 before decreasing to $230,000 in 2014. The median sales price of units and townhouses in the Bowen SLA was generally below that recorded in the Whitsunday RC and MIW region. The median sales price of units and townhouses in Bowen SLA peaked in 2007 at $392,500 (Figure 3.16).

Figure 3.16: Median Sale Price, Units and Townhouses, Bowen SLA, Whitsunday RC and MIW Region, 2001 to 2014

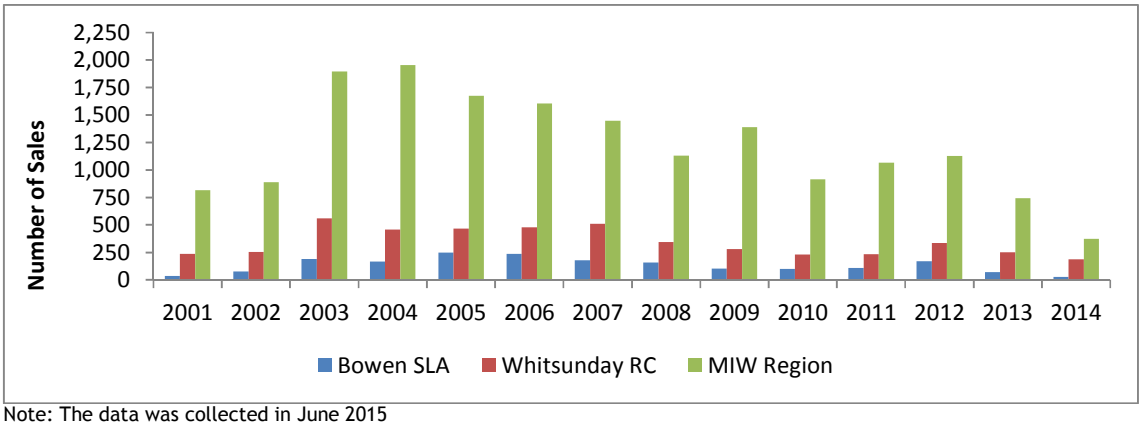


Note: The data was collected in June 2015
Source: Price Finder (2015)

Volume of Vacant Residential Land Sales

The volume of vacant residential land sales in the MIW region peaked at 1,952 sales in 2004 but had dropped to 372 sales in 2014. In the Bowen SLA, only 29 vacant land properties were sold in 2014 compared with a peak of 248 sales in 2005 (Figure 3.17).

Figure 3.17: Volume of Vacant Land Sales, Bowen SLA, Whitsunday RC and MIW Region, 2001 to 2014



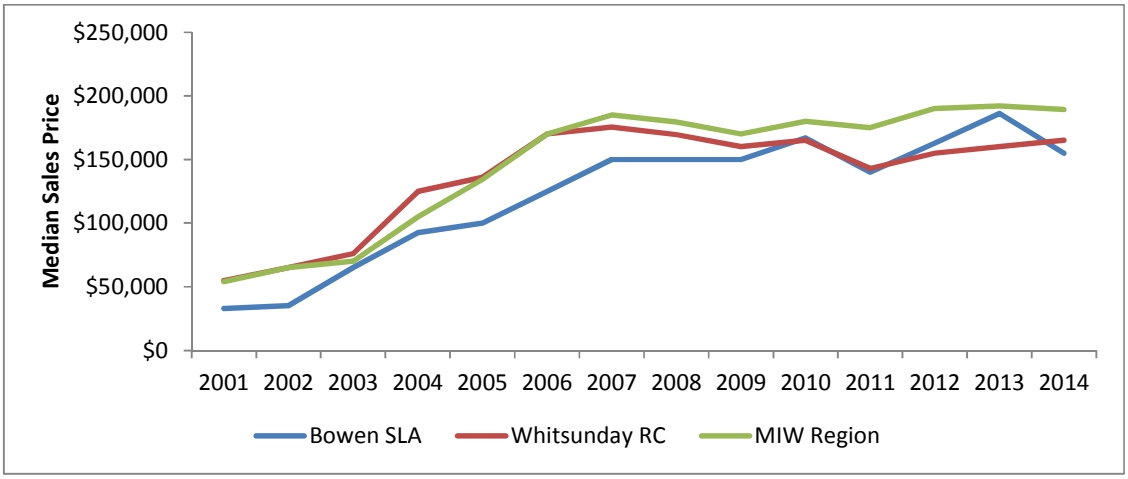
Note: The data was collected in June 2015
Source: Price Finder (2015)

Median Sale Price for Vacant Residential Land

The median sale price of vacant land in the MIW region increased from $54,000 in 2001 to $192,000 in 2013 (Figure 3.18).

In the Bowen SLA, the median sale price of vacant land increased from $33,000 in 2001 to $186,000 in 2010, before falling to $155,000 in 2014. This figure was lower than for properties in the Whitsunday RC and MIW region, with the exception of between 2010 and 2013.

Figure 3.18: Median Sale Price, Vacant Land, Bowen SLA, Whitsunday RC and MIW Region, 2001 to 2014



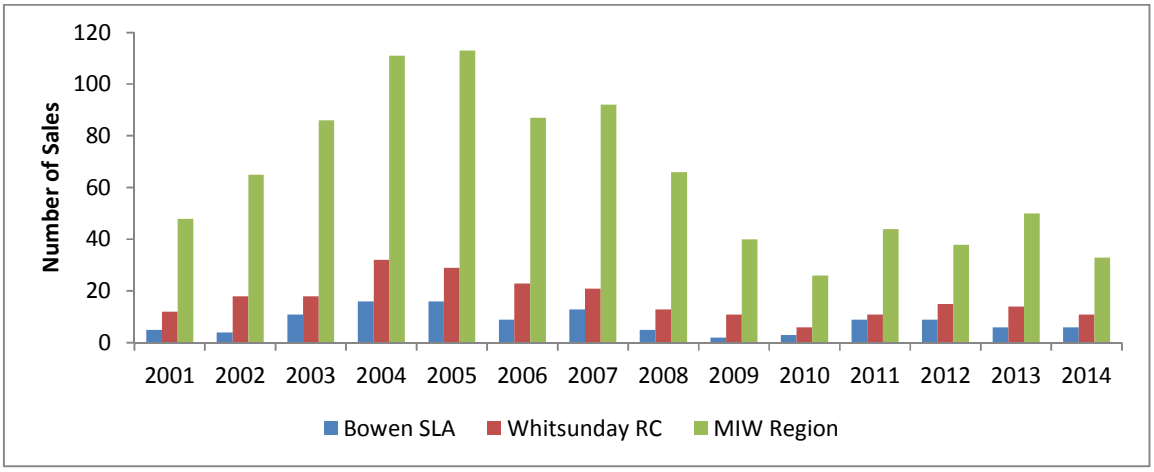
Note: The data was collected in June 2015
Source: Price Finder (2015)

3.5.2 Commercial Property

Volume of Commercial Property Sales

The number of commercial property sales in the MIW region consistently increased between 2001 and 2005, with sales volumes peaking at 113 sales in 2005 (Figure 3.19). There were only limited commercial property sales in the Bowen SLA, with sales ranging from two sales (2009) to 16 sales (2004 and 2005) per annum.

Figure 3.19: Volume of Commercial Sales, Bowen SLA, Whitsunday RC and MIW Region, 2001 to 2014

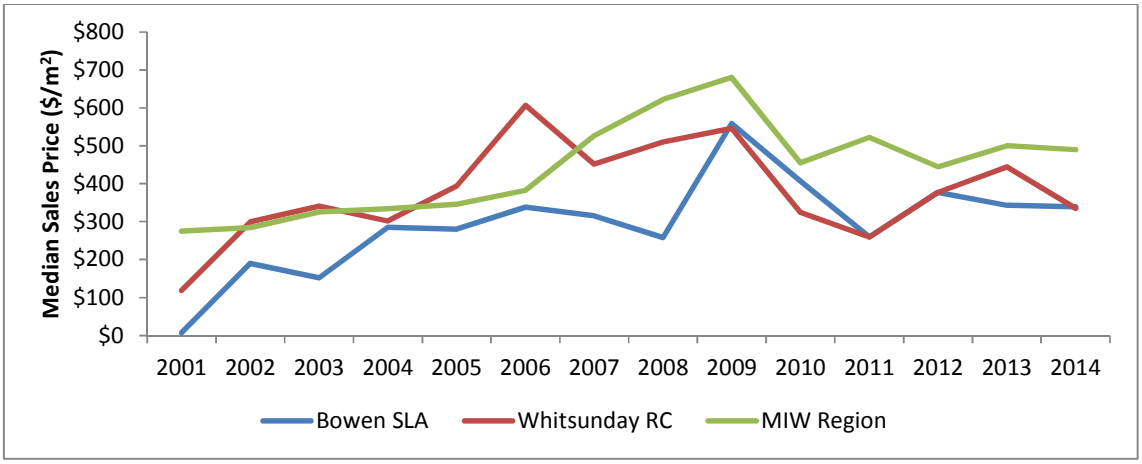


Note: The data was collected in June 2015
Source: Price Finder (2015)

Median Sale Price for Commercial Property

The median sale price of commercial property in the MIW region increased from $\$275/m^2$ in 2001 to $\$522/m^2$ in 2011, peaking at $\$680/m^2$ in 2009 (Figure 3.20). In the Bowen SLA, the median sale price of commercial property increased from $\$7/m^2$ in 2001 to $\$559/m^2$ in 2009, before falling to $\$260/m^2$. The median sale price of commercial property in the Bowen SLA was consistently lower than in the MIW region.

Figure 3.20: Median Sale Price ($/m^2), Commercial, Bowen SLA, Whitsunday RC and MIW Region, 2001 to 2014



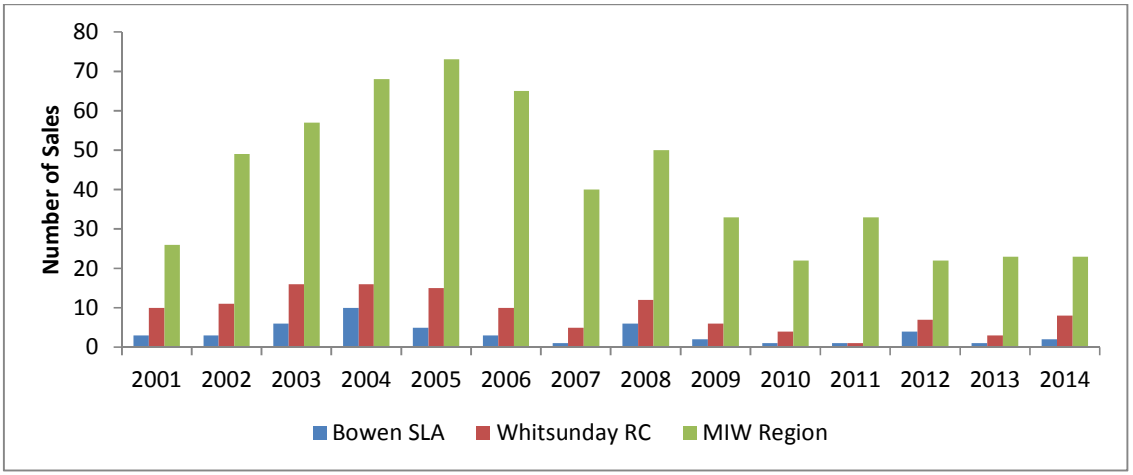
Note: The data was collected in June 2015
Source: Price Finder (2015)

3.5.3 Industrial Property Market

Volume of Industrial Property Sales

The volume of industrial property sales in the MIW region was highest in 2004 (68 sales), 2005 (73 sales) and 2006 (65 sales). Between 2001 and 2014, there were 48 industrial property sales in the Bowen SLA with the most sales occurring in 2004 (10 sales) (Figure 3.21).

Figure 3.21: Volume of Industrial Land Sales, Bowen SLA, Whitsunday RC and MIW Region, 2001 to 2014

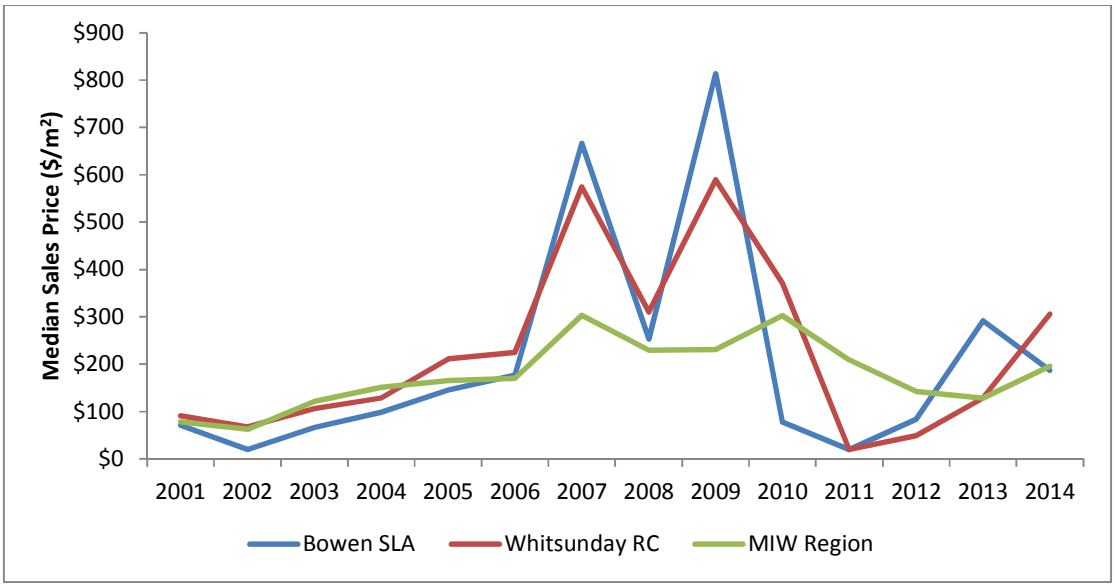


Note: The data was collected in June 2015
Source: Price Finder (2015)

Median Sale Price for Industrial Property

There were only a limited number of industrial property sales in the Bowen SLA. As such, given the small sample size involved, the median sale price per square metre fluctuated significantly between 2001 and 2014. Specifically, the median sale price fluctuated between $20/m^2 (2011) and $813/m^2 (2009) (Figure 3.22).

Figure 3.22: Median Sale Price ($/m^2), Industrial, Bowen SLA, Whitsunday RC and MIW Region, 2001 to 2014



Note: The data was collected in June 2015
Source: Price Finder (2015)

3.6 Construction & Building Approvals

3.6.1 Residential Building Approvals

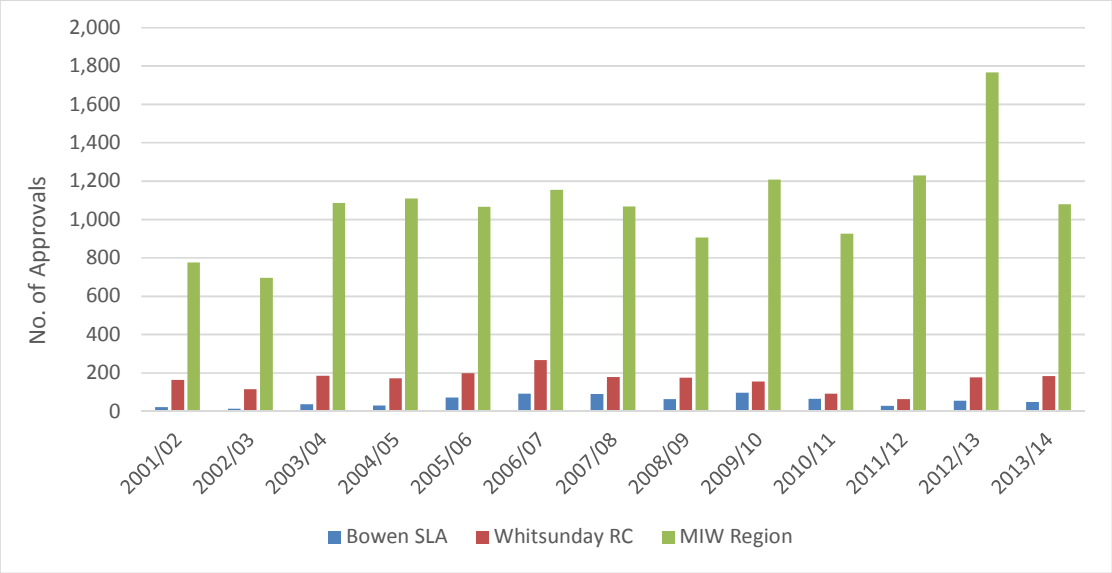
Number of New House Approvals

The number of new house approvals in the MIW region peaked in 2012-13 at 1,767 approvals. New house approval levels have remained above 1,000 approvals per annum in the MIW region since 2003-04, with the exception of 2008-09 and 2010-11 when declines in activity were noted (Figure 3.25).

New house approvals in Whitsunday RC peaked in 2006-07 at 267 approvals. New house approval activity in the Whitsunday RC decreased consistently from 267 approvals in 2006-07 to 64 approvals in 2011-12, before recovering to 184 approvals in 2013-14.

The number of new house approvals in Bowen SLA increased from 22 approvals in 2001-02 to 50 approvals in 2010-11, peaking at 98 in 2009-10. Since then, approval activities have decreased slightly.

Figure 3.23: Number of New House Approvals, Bowen SLA, Whitsunday RC and MIW Region, 2001-02 to 2013-14



Source: Australian Bureau of Statistics (various years)

Number of New 'Other' Residential Approvals

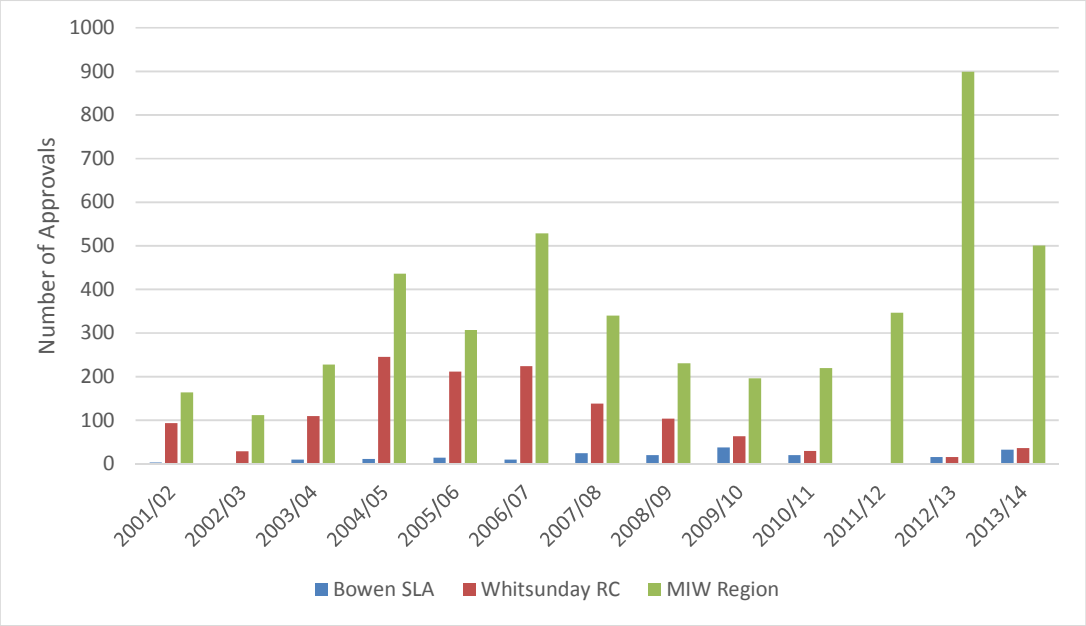
As with new house approvals, the Whitsunday RC accounted for a reasonable proportion of new 'other'[8] residential approvals in the MIW region, ranging between 1.0% and 59.0% of total approvals in the past 10 years.

The number of new 'other' residential approvals in the MIW region was significantly higher in 2012/13 than in all other years at 899 approvals (Figure 3.26). The number of approvals fell consistently between 2006-07 and 2009-10.

The number of new 'other' residential approvals in the Bowen SLA fluctuated significantly from no approvals in 2002-03 to 33 approvals in 2013-14, peaking at 38 approvals in 2010-11.

[8] 'Other' residential approvals pertain to approvals for attached dwellings, such as townhouses and apartments, and other forms of residential accommodation.

Figure 3.24: Number of New Other Residential Approvals, Whitsunday RC and MIW Region, 2001-02 to 2013-14



Source: Australian Bureau of Statistics (various years, a)

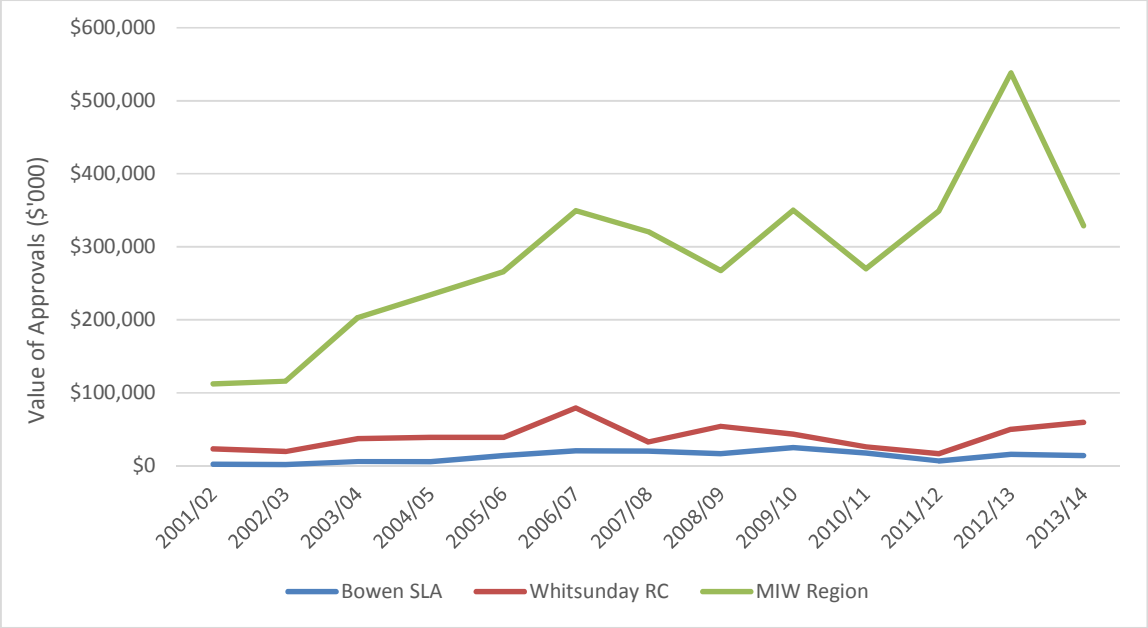
Value of New House Approvals

In the Whitsunday RC, the value of new house approvals increased significantly in 2006-07, marginally more than double the value of new house approvals recorded in the previous financial year.

The value of new house approvals in the MIW region has consistently increased over the past 10 years, with the exception of 2008-09 and 2010-11, where the value of new approvals fell, consistent with a decline in the number of new house approvals (Figure 3.27).

The value of new house approvals in the Bowen SLA has increased from $2.5 million in 2001-02 to $17.7 million in 2010-11, peaking at $24.9 million in 2009-10. In 2013-14, the value of new house approvals in Bowen SLA was $14.2 million.

Figure 3.25: Value of New House Approvals ($'000), Whitsunday RC and MIW Region, 2001-02 to 2013-14



Source: Australian Bureau of Statistics (various years, a)

Value of New Other Residential Approvals

The value of new 'other' residential approvals in the MIW region has been volatile over the past 10 years, peaking in 2006-07 at $143.7 million (Figure 3.26). In the Whitsunday RC, the value of new 'other' residential approvals ranged from $5.9 million (2002-03) to $81.5 million (2004-05). In the Bowen SLA, the value of new 'other' residential approvals ranged from zero (2002-03) to $7.0 million (2009-10).

Figure 3.26: Value of New Other Residential Approvals ($'000), Whitsunday RC and MIW Region, 2001-02 to 2013-14

Source: Australian Bureau of Statistics (various years, a)

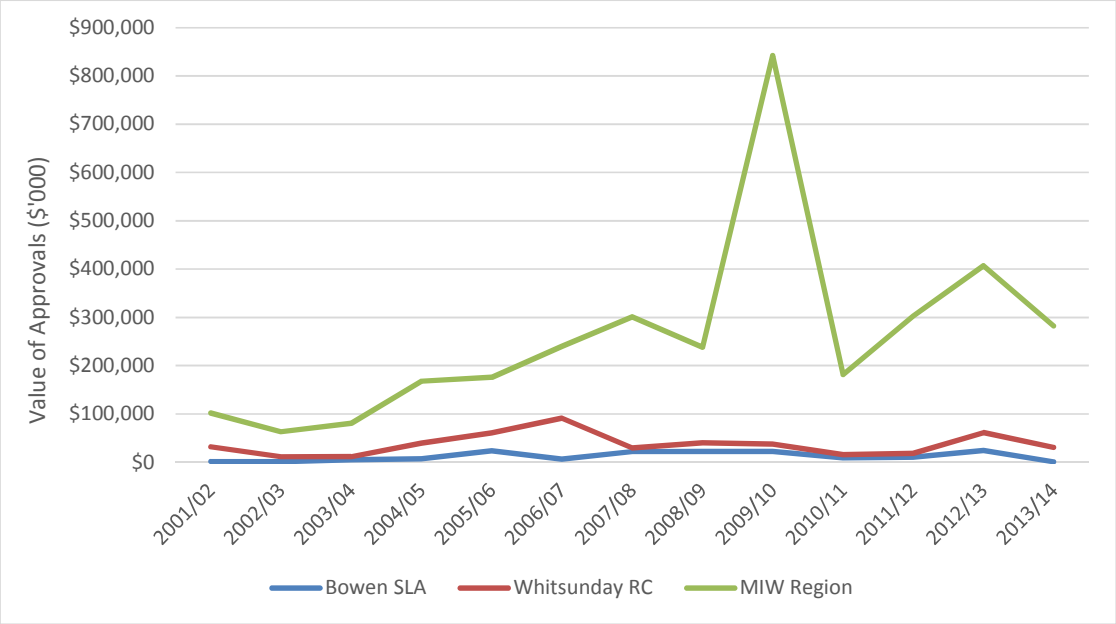
3.6.2 Non-Residential Building Approvals

The value of non-residential building approvals in Whitsunday RC peaked in 2006-07 at $90.8 million (Figure 3.27). In the Whitsunday RC, the value of new non-residential building approvals increased significantly in 2004-05 and 2005-06.

In the MIW region the value of non-residential building approvals increased between 2002-03 and 2007-08. The MIW region recorded a spike in the value of non-residential building approvals in 2009-10 at $842.3 million.

The value of non-residential building approvals in the Bowen SLA fluctuated considerably from 2002-03 to 2010-11, with a low of $0.5 million in 2002-03 and high of $24.5 million in 2012-13.

Figure 3.27: Value of Non-Residential Building Approvals ($'000), Whitsunday RC and MIW Region, 2001-02 to 2013-14



Source: Australian Bureau of Statistics (various years, a)

3.7 Availability of Commercial Accommodation within the MIW Region

The following assessment of the Abbot Point study area accommodation and housing markets relates to the stock and availability of commercial accommodation including hotels, motels and serviced apartments with 15 or more rooms.

The Tourist Accommodation, Small Area Data, Queensland publication (ABS, various years) is available from the September quarter of 2010 for hotels, motels and serviced apartments with 15 or more rooms. The publication is now released annually with the latest publication available to June quarter 2014.

3.8 Commercial Accommodation in MIW Region

In the June quarter 2014, the study area had the following accommodation (Table 3.12):

- Bowen SLA: 6 hotels, motels and serviced apartments with a total of 157 rooms;
- Whitsunday RC: 32 hotels, motels and serviced apartments with a total of 2,322 rooms; and
- MIW Region: 86 hotels, motels and serviced apartments with a total of 4,283 rooms.

Occupancy rates for hotels, motels and service apartments in Bowen SLA peaked in September quarter 2011 at 75.3% (Table 3.13). The average occupancy rate in the Bowen SLA from September quarter 2010 and June quarter 2014 for hotels, motels and serviced apartments in Bowen SLA was lower than the Whitsunday RC, MIW Region and State average, pointing to a potential excess supply of short-term accommodation within the Bowen SLA

Table 3.12: Hotels, Motels and Serviced Apartments Establishments, Bowen SLA, Whitsunday RC, MIW Region and Queensland, June Quarter 2014

	Hotels, Motels & Serviced Apartments	
	No.	Rooms
Bowen SLA	6	157
Whitsunday RC	32	2,322
MIW Region	86	4,283
Queensland	1,124	61,274

Source: Australian Bureau of Statistics (various years, c)

Table 3.13: Occupancy Rate Trends for Hotels, Motels and Serviced Apartments, Bowen SLA, Whitsunday RC, MIW Region and Queensland, Sept Q 2010 to June Q 2014

Quarter	Bowen SLA	Whitsunday RC	MIW Region	Queensland
Sep Q 10	69.2%	56.1%	64.5%	68.9%
Dec Q 10	59.0%	57.5%	61.0%	64.8%
Mar Q 11	45.1%	41.0%	48.9%	58.1%
Jun Q 11	64.4%	45.6%	57.7%	61.0%
Sep Q 11	75.3%	57.2%	68.8%	70.5%
Dec Q 11	63.2%	58.5%	67.9%	66.9%
Mar Q 12	42.7%	47.0%	58.0%	62.3%
Jun Q 12	54.4%	48.9%	61.3%	62.6%
Sep Q 12	59.5%	59.1%	67.2%	71.0%
Dec Q 12	36.6%	60.9%	64.6%	67.0%
Mar Q 13	27.0%	51.0%	54.4%	61.2%
Jun Q 13	32.6%	48.4%	55.5%	60.3%
Sep Q 13	53.0%	58.7%	33.7%	67.0%
Dec Q 13	38.4%	67.4%	33.7%	67.3%
Mar Q 14	34.4%	65.2%	34.4%	59.8%
Jun Q 14	38.5%	61.0%	33.0%	59.3%
Average, Sept Q 10 to June Q 14	49.6%	55.2%	54.0%	64.3%

Source: Australian Bureau of Statistics (various years, c)

Within the Bowen SLA, the average number of vacancies per night averaged 100 rooms (Table 3.14). This provides a significant vacancy buffer to absorb short-term increases in accommodation demand potentially resulting from the Project.

Table 3.14: Average Number of Vacancies per Night, Bowen SLA, Whitsunday RC, MIW Region and Queensland, Sept Q 2010 to June Q 14

Quarter	Bowen SLA	Whitsunday RC	MIW Region	Queensland
Sep Q 10	65	1,267	1,807	19,237
Dec Q 10	87	1,231	1,982	21,764
Mar Q 11	116	1,691	2,529	25,606
Jun Q 11	75	1,367	1,941	23,691
Sep Q 11	50	1,216	1,538	17,946
Dec Q 11	78	1,144	1,553	20,208
Mar Q 12	105	1,468	2,049	23,128
Jun Q 12	85	1,387	1,786	22,679
Sep Q 12	72	1,100	1,508	17,588
Dec Q 12	115	1,053	1,625	20,231
Mar Q 13	126	1,338	2,103	23,757
Jun Q 13	116	1,381	2,038	24,522
Sep Q 13	74	1,017	2,955	20,249

Quarter	Bowen SLA	Whitsunday RC	MIW Region	Queensland
Dec Q 13	97	826	2,963	20,106
Mar Q 14	103	862	2,925	24,675
Jun Q 14	97	906	2,871	24,939
Average, Mar Q 05 to June Q 14	100	1,250	2,005	22,507

Source: Australian Bureau of Statistics (various years, c)

3.9 Regional Price Indices

3.9.1 Retail Price Index

In August 2013, the Queensland Treasury and Trade undertook a survey of regional retail prices of goods and services between Brisbane (comprising Brisbane, Ipswich, Moreton Bay and Redland local government areas) and 27 regional centres[9].

The analysis measured prices of a basket of goods and services across a number of categories as summarised in Table 3.15.

Table 3.15: Retail Price Index Category Groups, August 2013

Group	Item
Alcohol and tobacco	• Beer, wine, spirits, cigarettes/tobacco
Clothing and footwear	• Dry cleaning, clothing and shoes (men's, women's, children's)
Communication	• Fixed telephone account and postal charges[(a)]
Education	• Primary and secondary school fees, and higher education and institution fees [(a)]
Food and non-alcoholic beverages	• Bread and cereal products • Dairy and related products • Fruit and vegetables • Meals out and take away foods • Meat and seafood and non-alcoholic beverages
Furnishings, household equipment and services	• Furniture (bedding, lounge and dining), • Household appliances, utensils and tools (white goods, gardening and maintenance tools, kitchen utensils and cleaning utensils) • Household textiles (bath towels and pillows) • Men's and women's haircuts • Other household goods (cleaning products, nappies, batteries and toiletries)
Health	• Medical products (cold and flu tablets, cough mixture, moisturiser, paracetamol and ventolin inhaler) • Medical, dental and hospital services
Housing	• Electricity[(a)], kerosene, median weekly rent
Insurance and financial services	• Household contents insurance, • Comprehensive motor vehicle insurance, • Financial services and deposit and loan facilities
Recreation and culture	• Bicycles and board games • Computer repairs, console games and dvd hire • Electrical appliances (blu-ray player/recorders, digital cameras, MP3

[9] Regional centres included: Ayr, Beaudesert, Bowen, Bundaberg, Cairns, Cannonvale, Charleville, Charters Towers, Dalby, Emerald, Gatton, Gladstone, Gold Coast, Gympie, Kingaroy, Longreach, Mackay, Maryborough, Moranbah, Mount Isa, Rockhampton, Roma, Sunshine Coast, Toowoomba, Townsville, Warwick and Weipa.

Group	Item
	players, game consoles, television sets, laptops/notebooks), • Newspapers, books and stationery • Pet food, • Photographic services (developing digital photos), • Holiday travel and accommodation (domestic and international[a]), • Sports participation (swimming pool and tennis court hire)
Transportation [b]	• Fuel (unleaded and diesel) • Mechanical charges, • Sundries (car batteries, motor oil, tyres and spark plugs), • Other (vehicle registration, roadside assist membership, compulsory third party insurance and driver licences)[a] • Taxi charges

(a) Treated as the same across Queensland
(b) Excludes the purchase of a new car, which was collected in previous years
Source: Queensland Treasury and Trade (2013)

The index assumes that Brisbane = 100.0. The index number in each centre provides an indication of the relative level of prices compared to Brisbane.

Within the Whitsunday RC indexes were collated for Bowen and Cannonvale. In the broader MIW Region (excluding Whitsunday RC) indexes were collated for Mackay and Moranbah.

The Retail Price Index highlights that the overall cost of living in the study area relative to Brisbane is:

- 0.4% lower in Bowen;
- 4.3% higher in Cannonvale;
- 6.3% higher in Mackay; and
- 22.2% higher in Moranbah

Moranbah recorded the highest housing costs of all centres surveyed across Queensland, with housing costs around 87% higher than the Brisbane average (Table 3.16).

Table 3.16: Retail Price Index, Whitsunday RC and MIW Region, August 2013

Group	Whitsunday RC		MIW Region (ex. Whitsunday RC)	
	Bowen	Cannonvale	Mackay	Moranbah
Alcohol and tobacco	97.9	99.0	105.5	103.9
Clothing and footwear	104.7	102.2	104.6	131.4
Food and non-alcoholic beverages	101.1	98.4	113.7	112.3
Furnishings, household equipment and services	98.1	106.2	93.7	100.1
Health	100.4	100.6	100.00	100.00
Housing	90.6	110.7	120.2	186.9
Insurance and financial services	100.2	95.6	98.8	87.6
Recreation and culture	112.4	113.2	104.5	88.5
Transportation (b)	100.9	102.1	91.6	113.7
All items less housing	102.2	102.5	102.3	103.7
All items	99.6	104.3	106.3	122.2

Note: Separate indices for Communication and Education are not shown as they were treated as the same across Queensland.
Source: Queensland Treasury and Trade (2013)

3.9.2 Construction Price Index

The construction price index, as reported in the Rawlinson's Australian Construction Handbook, provides an indication of construction costs relative to Brisbane (Brisbane = 100). The construction price index was reported for the following towns within the MIW region:

- Mackay;
- Whitsunday Islands;
- Airlie Beach; and
- Bowen.

The construction price index highlights that costs are significantly higher in the Whitsunday Islands relative to Brisbane, likely due to the significant distance to transport inputs to construction.

Table 3.17: Construction Price Index, MIW Region, 2015

	Construction Price Index
Mackay	115
Whitsunday Islands	130
Airlie Beach	115
Bowen	115

Source: Rawlinsons (2015)

3.10 Summary

The economic regions considered relevant for the project include: the Bowen statistical local area (SLA), Whitsunday Regional Council area (Whitsunday RC) and the Mackay Isaac Whitsunday (MIW) region.

Between 2014 and 2036, population growth within the Bowen SLA (1.6% per annum) and Whitsunday RC (1.7% per annum) is expected to run below the Queensland average (1.9% per annum). Population growth within the MIW region over the same period is expected to run at 2% per annum. However, the growth in the working age population (15-64 year olds) is anticipated to track with or exceed the State average (1.2% per annum) within the Bowen SLA (1.2% per annum) and Whitsunday RC (1.3% per annum), while the working age population in the MIW region is expected to increase by 0.9% per annum.

As at the 2011 Census the age profile of the host regions was generally skewed towards working age males relative to the Queensland average. Population projections by age tend to indicate that the over representation of residents in the working age cohorts will over time contribute to an acceleration of the region's aging population.

Household incomes among Whitsunday RC households were below the Queensland average, while household incomes within the MIW region were considerably higher, indicating to some extent that residents of the Whitsunday RC have not benefited from rising incomes associated with resource sector development to the same extent as MIW region households.

Labour force participation across Queensland has reduced since 2011, however declines in labour force participation within the host regions has been less than that experienced at a State wide level. Unemployment has generally worsened across Queensland and the host regions since

2012, with unemployment levels currently above the Queensland average in Bowen SLA and Whitsunday RC. Unemployment within the MIW region remains well below the State average.

There are a range of resource projects moving through the planning and assessment phases. In total there are currently 13 coal projects, one mineral project and two other (transport infrastructure) projects identified within the MIW region (but outside of Whitsunday RC). The most significant of these projects in terms of estimated capital expenditure are Carmichael mine and rail ($6 billion) and Grosvenor underground mine ($2 billion). Within Whitsunday RC there are currently three coal projects progressing through the planning and assessment process, with Byerwen open cut coal mine ($1.5 billion) most significant in terms of capital expenditure.

Analysis of gross regional product and regional competitive advantage indicates that the Whitsunday RC and MIW region are likely to experience continued growth and competitive advantage in the primary sector. Growth in the primary sector is likely to be driven by the mining sector with a number of mining projects in the development pipeline (refer to section 3.2.5). The agriculture, forestry and fishing sector recorded a decline in the working population between 2006 and 2011. This trend is anticipated to continue with a decline although at a slower rate.

Analysis of local and regional residential property markets indicates:

- Significant growth in the median price of residential property between 2001 and 2014 in all markets; and
- Average annual median price growth of 9.2% for houses and 4.2% for units within the MIW Region between 2001 and 2014, however median residential price growth more subdued from 2007 onwards in all markets.

Analysis of local and regional commercial property markets indicates:

- The number of commercial property sales peaked at 113 sales in 2005 in MIW region;
- Limited sales in Bowen SLA;
- Median sale price per square metre peaked in 2009;
- Median sale price per square metre significantly higher in MIW region than Bowen SLA and Whitsunday RC;

Analysis of local and regional industrial property markets indicates:

- Sales volumes in the MIW region were highest in the 2004-2006 period;
- The median sale price per square metre in the MIW region peaked in 2010, with a significant decline recorded in 2011; and
- The median sale price per square metre in the Bowen SLA and Whitsunday RC peaked in 2009 with significant declines recorded in 2010 and 2011.

Overall, there has been a softening in residential, commercial and industrial property markets across the host regions since 2010, with the number of sales generally declining across all sectors and regions post 2010 and there being a consequent softening of price growth over the same period.

In the June quarter 2014, the study area had the following accommodation:

- Bowen SLA: 6 hotels, motels and serviced apartments with a total of 157 rooms;

- Whitsunday RC: 32 hotels, motels and serviced apartments with a total of 2,322 rooms; and
- MIW Region: 86 hotels, motels and serviced apartments with a total of 4,283 rooms.

Occupancy rates for hotels, motels and service apartments in Bowen SLA peaked in September quarter 2011 at 75.3%, but have since fallen considerably to 38.5% in June 2014. The average occupancy rate from September quarter 2010 and June quarter 2014 for hotels, motels and serviced apartments in Bowen SLA (49.6%) was lower than the Whitsunday RC (55.2%), MIW Region (54.0%) and State average (63.3%), pointing to a potential excess supply of short-term accommodation within the Bowen SLA

Within the Bowen SLA, the average number of vacancies per night averaged 100 rooms (Table 3.14). This provides a significant vacancy buffer to absorb short-term increases in accommodation demand potentially resulting from the Project.

In August 2013, the Queensland Treasury and Trade undertook a survey of regional retail prices of goods and services between Brisbane (comprising Brisbane, Ipswich, Moreton Bay and Redland local government areas) and 27 regional centres[10].

The index assumes that Brisbane = 100.0. The index number in each centre provides an indication of the relative level of prices compared to Brisbane.

Within the Whitsunday RC indexes were collated for Bowen and Cannonvale. In the broader MIW Region (excluding Whitsunday RC) indexes were collated for Mackay and Moranbah.

The Retail Price Index highlights that the overall cost of living in the study area relative to Brisbane is:

- 0.4% lower in Bowen;
- 4.3% higher in Cannonvale;
- 6.3% higher in Mackay; and
- 22.2% higher in Moranbah.

The construction price index, as reported in the Rawlinson's Australian Construction Handbook, provides an indication of construction costs relative to Brisbane (Brisbane = 100). The construction price index was reported for the following towns within the MIW region:

- Mackay (115);
- Whitsunday Islands (130);
- Airlie Beach (115); and
- Bowen (115).

The above indicates that construction costs in the MIW region are generally 15% higher than in Brisbane.

Overall, the host regions can be characterised as having local and regional economies that are heavily dependent on primary production (agriculture and mining), and as such have generally

[10] Regional centres included: Ayr, Beaudesert, Bowen, Bundaberg, Cairns, Cannonvale, Charleville, Charters Towers, Dalby, Emerald, Gatton, Gladstone, Gold Coast, Gympie, Kingaroy, Longreach, Mackay, Maryborough, Moranbah, Mount Isa, Rockhampton, Roma, Sunshine Coast, Toowoomba, Townsville, Warwick and Weipa.

experienced significant stimulus from major resource sector investment. Much of this stimulus has been concentrated in the MIW region outside of the Whitsunday RC.

4 ECONOMIC IMPACT ASSESSMENT

The purpose of this section of the report is to estimate the economic impacts of the construction and operating phase of the Project. Specifically, the assessment considers the stimulus generated by the construction and operating phases on the regional economy. The assessment considers the extent of these impacts across a range of measures, including:

- Output (or consumption);
- Household incomes;
- Employment (as measures by full time equivalents); and
- Value added.

The impact assessment also seeks to assign values for the impact on vegetation communities either directly or indirectly impacted by the Project. Finally, the impact assessment also articulates the value of exports facilitated by the proposed Project. In considering export values, it is important to note that the Project is one of a number of projects that facilitate those exports.

4.1 Construction Impacts

The Project is expected to generate significant economic activity during the construction phase. However, it should be noted that the works associated with the construction phase are highly capital intensive. As such, while employment generated by the Project is an important benefit, it is not as significant as what might occur in another heavy and civil engineering construction[11] project.

Construction costs for the Project were provided by the Department of State Development (DSD) and have been estimated based on concept design and on current market prices. As a tender process is currently being undertaken for the Project, an exact figure cannot be provided to ensure the integrity and accountability of the tender process. Hence, at this stage of Project planning DSD is anticipating Project costs to fall within a range, represented by low and high scenarios between $50 million and $100 million.

The construction phase of the Project is anticipated to be undertaken in under a year.

The estimation of economic impacts during the construction phase is based on the two construction cost scenarios. As such, a range of estimated economic impacts is reported. Table 4.1 reports the estimated economic impacts of the construction phase of the Project across the range of estimated construction costs and is summarised in the sections which follow.

Being a heavy and civil engineering construction project, the majority of construction phase impacts are in the construction sector.

Procurement for the project is yet to be finalised, however it is anticipated that construction services, materials and inputs required by the project could be sourced from in the MIW region.

[11] Capital dredging projects are classified as 'heavy and civil engineering construction' projects under the Australia and New Zealand Standard industry Classification system.

4.1.1 Output

Output impacts relate to the overall economic activity generated by Project expenditures. As such, output is a measure of activity or turnover of expenditure as opposed to net value.

The output impacts of the Project during its construction phase are anticipated to be between:

- $62.60 million, comprising $50.00 million in direct output and $12.60 million in indirect output; and
- $125.19 million, comprising $100.00 million in direct output and $25.19 million in indirect output.

4.1.2 Household Income

Household income impacts relate to changes in incomes, predominantly in the form of wages and salaries paid to workers, as a result of the Project. However, it is important to note that workers on engineering construction projects typically move from project to project, hence this project could be considered an addition to the existing pipeline of project work that these workers might be engaged on.

The household income impacts of the Project during its construction phase are anticipated to be between:

- $9.90 million, comprising $6.78 million in direct household income, and $3.12 million in indirect household income; and
- $19.80 million, comprising $13.56 million in direct household income, and $6.24 million in indirect household income.

4.1.3 Employment

As already stated, changes in employment resulting from the Project might arise as either new employment opportunities or additional shifts for existing workers. As outlined above, engineering construction projects typically move from project to project, and this Project could be considered an addition to the pipeline of existing project work that these workers might be engaged on. Employment impacts are measures as FTEs, which represent approximately 1,800 hours of labour in a single year.

Employment impacts of the Project during its construction phase are anticipated to be between:

- 82 FTEs, comprising 39 direct FTEs and 43 indirect FTEs; and
- 164 FTEs, comprising 78 direct FTEs and 86 indirect FTEs.

4.1.4 Value Added

Value added represents the net value of economic activity generated by the construction phase of the Project. It represents the combination of remuneration to employees (e.g. wages and salaries) and gross operating surplus of business entities.

Value added impacts of the Project during its construction phase are anticipated to be between:

- $23.25 million, comprising $17.49 million in direct value added and $5.76 million in indirect value added; and

- $46.50 million, comprising $34.98 million in direct value added and $11.51 million in indirect value added.

Table 4.1: Estimated economic impacts of the construction phase of the project, low and high scenarios

Sector/impact	Low Scenario				High Scenario			
	Output ($M)	Income ($M)	Employment (FTEs)	Value Added ($M)	Output ($M)	Income ($M)	Employment (FTEs)	Value Added ($M)
Agriculture, Forestry & Fishing	$0.07	$0.01	0	$0.04	$0.15	$0.02	1	$0.08
Mining	$1.39	$0.26	2	$0.81	$2.78	$0.52	5	$1.62
Manufacturing	$2.18	$0.49	5	$0.80	$4.36	$0.97	11	$1.60
Electricity, Gas, Water & Waste Services	$0.22	$0.09	1	$0.15	$0.43	$0.17	2	$0.30
Construction	$54.20	$7.57	54	$19.05	$108.39	$15.13	107	$38.10
Wholesale Trade	$0.41	$0.15	1	$0.23	$0.82	$0.30	3	$0.46
Retail Trade	$0.16	$0.07	2	$0.11	$0.33	$0.15	3	$0.22
Accommodation & Food Services	$0.07	$0.02	1	$0.04	$0.13	$0.05	1	$0.07
Transport, Postal & Warehousing	$0.75	$0.20	3	$0.40	$1.50	$0.40	6	$0.80
Information Media and Telecommunications	$0.06	$0.01	0	$0.04	$0.13	$0.02	0	$0.07
Financial & Insurance Services	$0.21	$0.10	0	$0.18	$0.43	$0.19	1	$0.37
Rental, Hiring & Real Estate Services	$0.79	$0.17	2	$0.32	$1.58	$0.34	4	$0.64
Professional, Scientific & Technical Services	$1.19	$0.39	6	$0.61	$2.37	$0.78	11	$1.22
Administrative & Support Services	$0.49	$0.23	2	$0.27	$0.99	$0.47	4	$0.54
Public Administration & Safety	$0.07	$0.04	0	$0.04	$0.13	$0.07	1	$0.09
Education & Training	$0.00	$0.00	0	$0.00	$0.00	$0.00	0	$0.00
Health Care & Social Assistance	$0.00	$0.00	0	$0.00	$0.01	$0.00	0	$0.00
Arts & Recreation Services	$0.01	$0.00	0	$0.00	$0.01	$0.00	0	$0.00
Other Services	$0.33	$0.10	3	$0.17	$0.67	$0.21	5	$0.34
Direct	**$50.00**	**$6.78**	**39**	**$17.49**	**$100.00**	**$13.56**	**78**	**$34.98**
Indirect	**$12.60**	**$3.12**	**43**	**$5.76**	**$25.19**	**$6.24**	**86**	**$11.51**
Total	**$62.60**	**$9.90**	**82**	**$23.25**	**$125.19**	**$19.80**	**164**	**$46.50**

Note: Totals might not add due to rounding

4.2 Operating Impacts

The construction phase comprises capital dredging and the construction of the DMCP for dredged material. Subsequent to the completion of dredging there will be ongoing costs associated with managing the DMCP. These operating costs are expected to average approximately $1.25 million per annum over a five year period.

Table 4.2 reports the annual operating impacts of the Project. These annual impacts would run for approximately five years, resulting in a total operating cost of $6.25 million.

Specifically, annual operating economic impacts of the Project are estimated at:

- $1.56 million in output, comprising $1.25 million in direct output and $0.31 million in indirect output;
- $0.25 million in household income, comprising $0.17 million in direct household income and $0.08 million in indirect income;
- 2.1 FTEs, comprising one direct FTE and 1.1 indirect FTEs; and
- $0.58 million in value added, comprising, $0.44 million in direct value added and $0.14 million in indirect value added.

Table 4.2: Annual operating impacts of the project (five years)

Sector	Output ($M)	Income ($M)	Employment (FTEs)	Value Added ($M)
Agriculture, Forestry & Fishing	$0.00	$0.00	0.0	$0.00
Mining	$0.03	$0.01	0.1	$0.02
Manufacturing	$0.05	$0.01	0.1	$0.02
Electricity, Gas, Water & Waste Services	$0.01	$0.00	0.0	$0.00
Construction	$1.35	$0.19	1.3	$0.48
Wholesale Trade	$0.01	$0.00	0.0	$0.01
Retail Trade	$0.00	$0.00	0.0	$0.00
Accommodation & Food Services	$0.00	$0.00	0.0	$0.00
Transport, Postal & Warehousing	$0.02	$0.00	0.1	$0.01
Information Media and Telecommunications	$0.00	$0.00	0.0	$0.00
Financial & Insurance Services	$0.01	$0.00	0.0	$0.00
Rental, Hiring & Real Estate Services	$0.02	$0.00	0.0	$0.01
Professional, Scientific & Technical Services	$0.03	$0.01	0.1	$0.02
Administrative & Support Services	$0.01	$0.01	0.0	$0.01
Public Administration & Safety	$0.00	$0.00	0.0	$0.00
Education & Training	$0.00	$0.00	0.0	$0.00
Health Care & Social Assistance	$0.00	$0.00	0.0	$0.00
Arts & Recreation Services	$0.00	$0.00	0.0	$0.00
Other Services	$0.01	$0.00	0.1	$0.00
Direct	**$1.25**	**$0.17**	**1.0**	**$0.44**
Indirect	**$0.31**	**$0.08**	**1.1**	**$0.14**
Total	**$1.56**	**$0.25**	**2.1**	**$0.58**

Note: Totals might not add due to rounding

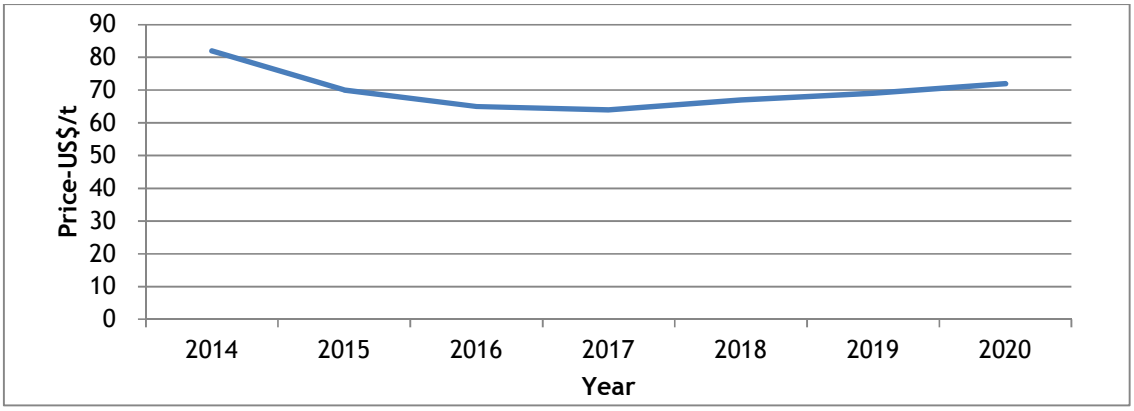
4.3 Value of Exports Facilitated

The export throughput of the Port of Abbot Point in 2013-14 was 22.9Mt of coal. The existing capacity of the Port of Abbot Point is approximately 50Mtpa. The Abbot Point Growth Gateway Project will allow for the expansion of export capacity by an additional 70Mtpa. The vast majority of additional coal throughput facilitated by the expansion of Abbot Point is likely to be thermal coal, sourced from the Galilee Basin.

The short-term outlook for thermal coal prices is negative with prices expected to fall over the next one to two years (Figure 4.1), before recovering to current levels by 2020 (approximately $US70/t). The impact of the anticipated short-term softening in coal prices over the next one to two years is mitigated by an expectation that the value of the Australian dollar will continue to depreciate from its current (June 2015) level of ~0.77USD to 0.70 USD by early-mid 2016.

A short to medium term thermal coal price in the order of USD70/t and an exchange rate of between 0.70USD and 0.80USD, implies an Australian dollar denominated coal price of between approximately $88/t and $100/t. The Project could facilitate additional throughput of 70Mtpa of largely thermal coal which would have a value in the order of $6.1 billion to $7.0 billion.

Figure 4.1: Thermal coal price outlook, 2014-2020 (US$/t)



Source: BREE (2015) Resources & Energy Quarterly, March 2015

4.4 Opportunity Cost of Project

Alternative Uses for the Placement Site

Opportunity cost represents the next best alternative to what is being proposed. In terms of potential marine impacts, the opportunity cost is represented by the loss of vegetation habitats that generate a range of use (e.g. fisheries) and non-use values. However, onshore the opportunity cost is likely to be an economic use associated with port operations. The onshore area predominantly affected is the DMCP, which was designated for an alternative development. Apart from utilising the T2 site for onshore placement of dredged material, discussions NQBP and the DSD indicated that there are no short to medium term plans to use the T2 site. Use of the land for dredged material placement is likely to sterilise the land for an economic use for the short-term over which time the site would need to be dewatered and compacted.

As such, the opportunity cost of the use of the T2 site for onshore placement of dredged material and the subsequent short to medium term sterilisation of that land for an alternative use is unlikely to have a material opportunity cost. This is because there are no immediate plans for alternative use of the land and as such it will be retained as vacant strategic port land in the short to medium term.

Vegetation Communities to be Impacted

Direct impacts occur predominantly within and immediately adjacent to infrastructure footprints where dredges excavate the seabed. Direct impacts typically involve irreversible loss of benthic habitats and communities, where irreversible is defined as lacking a capacity to return or recover to a state resembling that prior to being impacted within a timeframe of five years or less.

The direct impact area covers approximately 61ha, comprising 10.5 hectares within the berth pocket areas and 50.5 hectares within the apron areas. Advisian advise that seagrass coverage in these areas is approximately 5%, which represents 0.5 hectares of seagrass within the berth pockets and 2.5 hectares of seagrass within the aprons (refer to Table 4.3 below). Advisian also advise that seagrass cover can be expected to return to approximately 5% within the aprons area, while the habitat within the berth pockets would simply be open substrate. The return of seagrass within the aprons indicates that there would be no permanent loss of seagrass within the aprons. The extent of area of seagrass loss within the berth pockets would become an area of open seabed, including establishment of communities similar to those of surrounding open seabed (offsetting to some extent the loss of ecosystem services provided by the seagrass).

Table 4.3: Area of direct impacts

	Berth Pockets	Aprons
Total area (ha)	10.5 ha	50.5 ha
Condition - Current	Seagrass at 5% cover	Seagrass at 5% cover
Seagrass cover (ha)	0.5 ha	2.5ha
Condition - Years 1 to 5 (conservative)	Open Substrate	Open Substrate
Condition - Years 6 to 20	Open Substrate	Seagrass at 5% cover

Source: Data provided by Advisian

Total Economic Framework for Valuation

The loss of habitat areas can be categorised as non-market benefits (or disbenefits). Guidelines prepared by the Queensland Government[12] set out a range of tools for estimating the value of such non-market benefits as follows:

- Methods based on market prices, for example taking the value of an externality (such as the loss of habitat areas) as equal to the cost of its prevention, its effect on economic production or its effect on loss of individual income via negative health impacts or the costs of activities necessary to avert a negative impact such as purchasing bottled water or boiling water for drinking;

[12] IDC-EEC (2003).

- Surrogate or proxy market methods, for example, valuing noise impacts by reference to variations in house prices (hedonic pricing), or valuing a wilderness area by inference from the costs individuals incur in travelling to it; and
- Survey-based methods which seek to obtain individuals' valuations of impacts using question and answer and related data modelling techniques. Examples include contingent valuation and choice modelling.

Each of these methods has advantages and disadvantages in terms of simplicity, reliability, cost and certainty. Contingent valuation, for example, is adaptable to a range of impact scenarios in terms of type and extent, but the process is expensive and the results can be subject to conjecture if respondents are unable to comprehend the impact under investigation or the nature of the questioning. Similarly, proxy methods can be expensive and may be constrained by the explanatory power of the available data (such as data reflecting variations in house prices according to environmental attributes). At the other end of the spectrum, some of the methods based on market prices are simple and inexpensive and may be appropriate where the range of potential mitigation strategies is limited or the necessity to avoid a negative impact is not in dispute[13].

This study uses the 'benefit transfer' technique in which valuations obtained from primary research conducted for other projects is applied to the project in question.

Environmental values for habitats affected by development can be categorised as being either:

- Use values, being those values derived from physical use of the environmental resource, including commercial activities, such as commercial fishing or tourism, and non-commercial activities, such as recreation; and
- Non-use values, which refer to:
  - Ecological function values: the value of the ecological services or functions provided by an environmental resource, such as provision of fish habitats and biodiversity;
  - Option values: the benefit derived from maintaining the right to use the resource without necessarily doing so;
  - Quasi-option values: the benefit derived from delaying a decision to develop an environmental resource to obtain better information regarding the impacts of that development on the resource;
  - Vicarious use values: the value derived by individuals in knowing that others are using the environmental resource;
  - Bequest values: the value of maintaining environmental values for the benefit of future generations; and
  - Existence values: the value derived by members of the community from the knowledge that areas of environmental value exist.

[13] A contingent valuation study that places a low value on reliably potable drinking water is of little use if the law and community expectations mandate potable water. In a case such as this, the valuation of the negative impact of a project on drinking water supplies would best be taken as the cost of mitigating the impact or of taking actions to avert the impact such as using bottled water.

This study derives values based on Costanza *et al* (1997) which is itself a meta-analysis of a range of detailed environmental and ecosystem services valuation studies across a range of vegetation communities and habitats across a range of regions around the world.

The habitat areas that are anticipated to be impacted by the Project are seagrass meadows and other benthic areas. Constanza *et al* (1997) reports values for seagrass at approximately $23,720/ha/annum. This value is based on a range of studies of well-established seagrass meadows. Seagrass coverage within the Project study area is ranges from between 1% and 10%, which represent low levels of seagrass coverage. This implies a need to moderate the Constanza *et al* (1997) seagrass values. This is done based on advice from Advisian (2015) which has calculated the area of seagrass based on total area multiplied by coverage. The Costanza *et al* seagrass value is applied to this area of seagrass, with the balance area subject to an alternative measure estimated by Costanza *et al* (1997) as a general value for coastal marine habitats of ~$5,065/ha/annum.

Indicative Value of Impact on Vegetation Communities

The calculation of direct impacts on marine habitat within the berth pockets and aprons assumes the permanent loss of seagrass within the berth pockets, but replaced by open substrate, and a five year loss of seagrass within the aprons.

Based on the parameter values articulated above, the annual value of direct impacts is estimated at:

- Berth pocket: 0.5 hectares of removed seagrass valued at $23,720/ha offset by the emergence of an open substrate habitat valued at $5,065/ha, culminating in an annual loss of ecosystem services of $9,328; and
- Aprons: 2.5 hectares of removed seagrass replaced by open substrate for five years, representing an annual ecosystem services loss of $46,638 for that five year period.

Based on a test discount rate of 6%, the above reductions in ecosystem services represent a capitalised value of $155,467 within the berth pockets and $196,456 within the aprons.

4.5 Anticipated Economic Impacts

The Project is anticipated to have a range of economic impacts, which in the context of existing public policy settings associated with employment and export growth could be considered positive, including:

- Facilitating (in association with a range of other major projects) the export of up to an additional 70Mtpa of largely thermal coal from Queensland, and the royalties associated with those exports;
- Generating economic activity within the MIW region in the heavy and civil construction sector, generating additional employment opportunities; and
- Generating opportunities for in-region supplies of support services to heavy and civil construction projects.

The Project also has the potential for a number of adverse impacts including:

- Opportunity cost of the Project in terms of lost ecosystem services;

- Short-term impacts on availability of housing and short-term accommodation associated with the construction phase of the Project; and
- Increased burden on local and regional infrastructure, particularly during the construction phase.

4.5.1 Assessment of Impacts

The assessment of impacts utilises a risk-based assessment framework based on the anticipated interaction of probability and consequence of impacts occurring.

Table 4.4 summarises the descriptors of the likelihood of a particular event occurring. Table 4.5 summarises the descriptors of the consequence of the impact occurring.

Table 4.4: Qualitative Measure of Likelihood

Descriptor	Description
Almost certain	It is expected to occur in most circumstances
Likely	It will probably occur in most circumstances
Possible	Might occur at some time
Unlikely	Could occur but not expected
Rare	May only occur in very exceptional circumstances
Remote	Has not previously manifested but is not inconceivable

Source: Derived from Queensland Treasury (2011)

Table 4.5: Qualitative Measure 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 effect a recovery.
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.

Source: Derived from Queensland Treasury (2011)

The interaction of likelihood and consequence determine the extent of impact. Table 4.6 outlines the matrix of interactions between different likelihoods and levels of consequence, which determine the level of impact (i.e. very low, low, medium, high, very high).

Table 4.6: 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

Source: Derived from Queensland Treasury (2011)

Table 4.7 provides an assessment of the anticipated economic impacts resulting from the Project.

Table 4.7: Assessment of economic impacts

Description of Impact	Nature (+ve or -ve)	Likelihood	Consequence	Impact
Facilitation of thermal coal exports The proposed Project will increase the coal throughput capacity of the Port of Abbot Point by approximately 70Mtpa. Based on a short to medium term thermal coal price in the order of USD70/t and an exchange rate of between 0.70USD and 0.80USD, an Australian dollar denominated coal price of between approximately $88/t and $100/t can be estimated. The Project could facilitate additional throughput of 70 Mtpa of largely thermal coal which would have a value in the order of $6.1 billion to $7.0 billion. However, it is noted that this Project is one of a number of projects that is required to enable additional coal exports, as such the consequence of this impact needs to be moderated in light of this.	+ve	Likely	Moderate	Medium
Creation of additional employment opportunities/demand The Project is anticipated to generate employment opportunities equivalent to between 82 and 164 FTE positions, comprising 39 to 78 direct FTEs and 43 to 86 indirect FTEs, during the less than one year construction phase. After the construction phase, operational employment benefits would manifest for approximately five years in the order of one FTE. These might not be in the form of new 'jobs' per se but rather a continued stream of employment opportunity for heavy and civil construction workers and their supply chains that rely on project-based work.	+ve	Almost certain	Minor	Medium
Creation of supply chain opportunities The indirect or flow-on economic impacts of the Project in terms of additional economic activity stimulated for supply chain firms is anticipated to be modest, as reflected in the value of indirect output impacts (i.e. between $12.60 million and $25.19 million compared to between $50.00 million and $100.00 million in direct impacts).	+ve	Almost certain	Minor	Medium
Opportunity cost of the Project The net value of direct negative impacts on ecosystem services is estimated at:	-ve	Almost certain	Minor	Medium

Description of Impact	Nature (+ve or -ve)	Likelihood	Consequence	Impact
• Berth pocket: 0.5 hectares of removed seagrass valued at $23,720/ha offset by the emergence of an open substrate habitat valued at $5,065/ha, culminating in an annual loss of ecosystem services of $9,328; and • Aprons: 2.5 hectares of removed seagrass replaced by open substrate for five years, representing an annual ecosystem services loss of $46,638 for that five year period. Based on a test discount rate of 6%, the above reductions in ecosystem services represent a capitalised value of $155,467 within the berth pockets and $196,456 within the aprons.				
Potential short-term impacts on the local housing and short-term accommodation market The Project will generate short-term demand for housing for workers directly and indirectly sourced by the Project. It is noted that short-term occupancy rates within the Bowen SLA are below the regional and State averages indicating significant capacity in local short-term accommodation markets. It is also noted that there is a large stock of vacant rental housing within Bowen available for short-term lease.	-ve	Unlikely	Minor	Low
Increased burden on local and regional infrastructure The Project will possibly impose additional burden on the local and regional infrastructure network during the construction phase. However, operational impacts would be negligible. The impacts on the local and regional infrastructure network would be almost entirely within the transport network and would be mitigated through measures addressed in the Traffic Impact Management Plan.	-ve	Possible	Minor	Low

5 MITIGATION MEASURES

The Project may potentially result in a range of adverse impacts including:

- Opportunity cost of the Project in terms of reduced ecosystem services;
- Short-term impacts on availability of housing and short-term accommodation associated with the construction phase of the project; and
- Increased burden on local and regional infrastructure, particularly during the construction phase.

5.1 Impacts Requiring Mitigation

Opportunity cost of the Project in terms of lost ecosystem services

It is understood that measures to ensure a net positive outcome in relation to environmental impacts to seagrass and other marine plants providing ecosystem services are addressed in the project EIS. These measures are subject to the requirements of relevant Environmental Authorities.

Localised inflation in the local housing and accommodation market

The Project has limited potential to result in increased housing costs within the host region, particularly during construction. However, the potential for this impact is significantly constrained by the high vacancy rates noted in commercial accommodation within Bowen, and the significant stock of rental housing available for short-term lease in this town.

To ensure that impacts are minimised it is recommended that the proponent consider housing the Project workforce across a mix of short-term accommodation and rental housing. This will ensure that there remains capacity in the short-term accommodation and rental housing markets to accommodate non-project related visitors through the duration of the project.

Increased burden on local and regional infrastructure

The Project has the potential to impact the capacity of local and regional infrastructure, mainly within road transport networks. The potential impacts are discussed in the Road Transport impact Assessment of the EIS, which also discusses mitigation measures.

5.2 Summary

The potential impacts resulting from the Project are not anticipated to be high and would generally be short-term. In addition, mitigation measures will be implemented to reduce the likelihood of the potential impacts. The increase in labour demand resulting from the Project is small in the context of the host economy. Mitigation measures recommended above are appropriate given the anticipated scale of impacts that need to be managed.

6 REFERENCES

Advisian (2015). *Personal communications dated 24 June 2015.*

Australian Bureau of Statistics (2005-06). *National Accounts: Input Output Tables 2005-06*, Catalogue No. 5209.0, Canberra

Australian Bureau of Statistics (2007). *Community Profile Series: Time Series Profile*, Catalogue No. 2003.0, Canberra

Australian Bureau of Statistics (2008). *Community Profile Series: Working Population Profile,* Catalogue No. 2003.0

Australian Bureau of Statistics (2012a). *2011 Census time series profile,* Canberra

Australian Bureau of Statistics (2012b). *Counts of Australian Businesses, including entries & exits*, Catalogue No. 8165.0, Canberra

Australian Bureau of Statistics (2012c). *Population Estimates by Age and Sex, Regions of Australia 2011*, Catalogue No. 3235.0, Canberra

Australian Bureau of Statistics (2012d). *Regional Population Growth, Australia,* Catalogue No. 3218.0, Canberra

Australian Bureau of Statistics (2012e). *Labour Force, Australia, Detailed- Electronic Delivery,* Catalogue No. 6291.0.55.001, Canberra

Australian Bureau of Statistics (various years, a). *Building Approvals, Australia,* Catalogue No. 8731.0

Australian Bureau of Statistics (various years, b). *2001 Basic Community Profile 2006 and 2011 Census,* Catalogue No. 2003.0

Australian Bureau of Statistics (various years, c). *Survey of Tourist Accommodation*, Catalogue No. 8635.3, Canberra

Bureau of Resource and Energy Economics (2015). *Resource & Energy Statistics,* Canberra

Costanza, R., d'Arge, R., de Groot, R., Faber, S., Grasso, M., Limburg, K., Naeem, S., O'Neil, R., Paruelo, J., Raskin, R., Sutton, P. and van den Belt, M. (1997). *The value of the world's ecosystem services and natural capital.* Nature, Vol. 387, May 1997, pp. 253-260

Department of Employment and Workplace Relations (various years). *Small Area Labour Market Statistics, unsmoothed series*

Office of Economic and Statistical Research (2013). *Population Projections by Age Cohort, low, medium and high series*

IDC-EEV (2003). *Environmental Economic Valuation,* Queensland Government, Brisbane

Jensen, R. and West, G. (2001). *Community Economic Analysis*, Department of Primary Industries: Brisbane, Queensland

Office of Economic and Statistical Research (2011a). *Gross State Product at Factor Cost by Industry & Main Components, Queensland, 2000-01 to 2010-11*

Office of Economic and Statistical Research (2011b). *Index of Retail Prices in Queensland Regional Centres*

Property Data Solutions (2012). Sales and Median Sales Price, Available at: http://www.pdslive.com.au/

Queensland Treasury (1997). *Project Evaluation Guidelines*, Brisbane

Queensland Treasury (2011). Guide to Risk Management, the State of Queensland, July 2011

Queensland Treasury (2015). *Regional Price Index*, Brisbane, Queensland Government.

Rawlinsons (2015). *Australia Construction Handbook,* Edition 33, 2015