Adani Mining Pty Ltd

NORTH GALILEE BASIN RAIL PROJECT

Environmental Impact Statement

Chapter 16 Social and economic impacts

November 2013

Table of contents

Table index

Figure index

16. Social and economic impacts

16.1 Purpose of chapter

The purpose of this chapter is to assess the potential social and economic impacts of the NGBR Project as well as propose measures to avoid or mitigate the identified impacts and enhance positive impacts. It also provides an overview of the existing social and economic environment and methodology for assessing impacts. Further details of the relevant existing social and economic environment are provided in Volume 2 Appendix M Social baseline and Appendix N Economics.

The assessment has been undertaken in accordance with the NGBR Project Terms of Reference (TOR) relevant to social and economic considerations. A cross reference table to the TOR is provided in Volume 2 Appendix A TOR cross-reference.

All mitigation and management measures identified in this chapter are included within Volume 2 Appendix P Environmental management plan framework.

16.2 Methodology

16.2.1 Study area

The study area for the social and economic assessment has three components:

Local study area

The local study area comprises the 64 properties (individual lot on plans which may be managed separately or with other lots) crossed by the NGBR Project final rail corridor (a nominally 100 m wide corridor) (refer Figure 16-1).

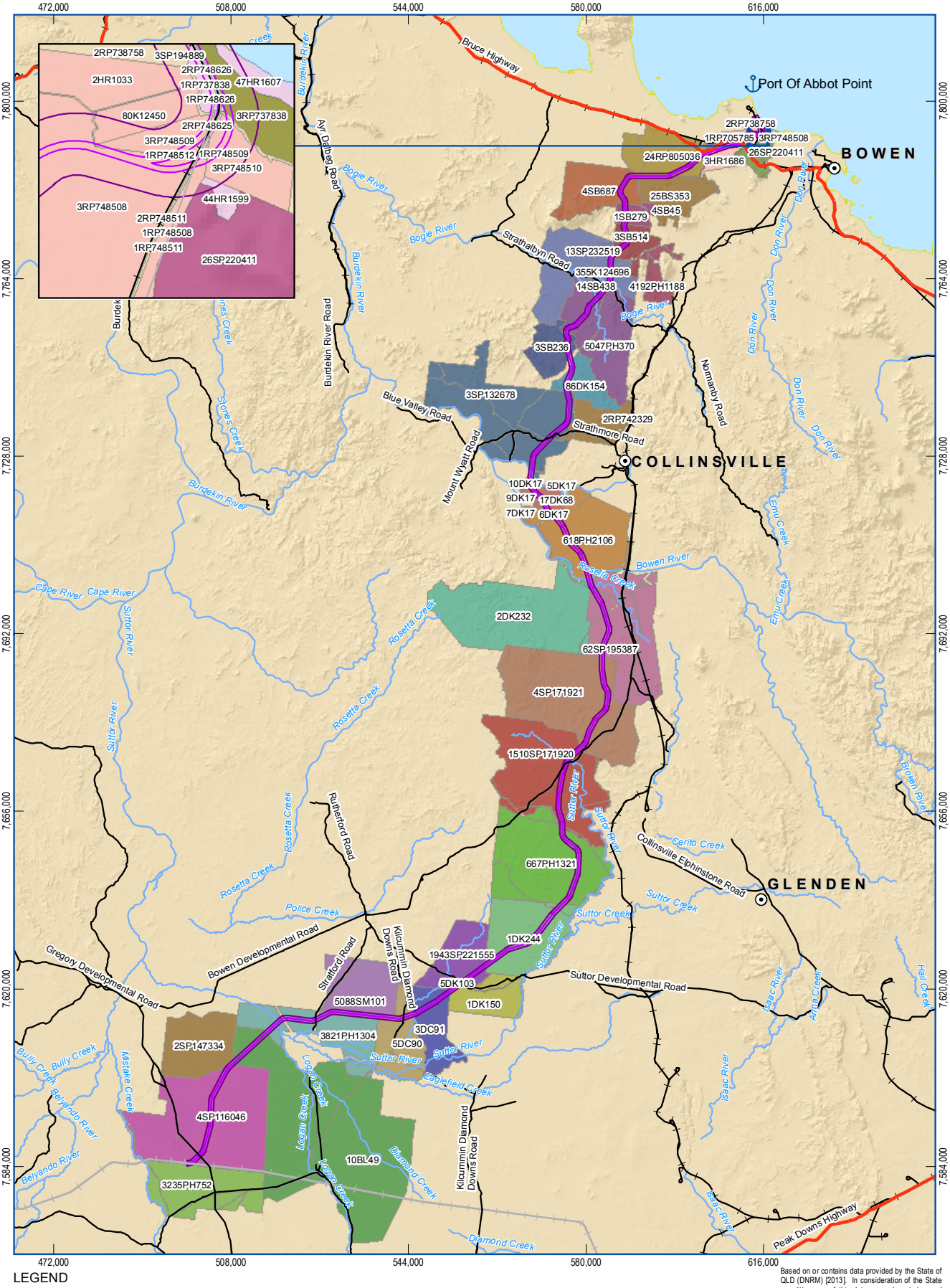
Regional study area

The regional study area comprises the local government areas (LGAs) crossed by the NGBR Project preliminary investigation corridor (a nominally 1,000 m wide corridor) (refer Figure 16-2). These LGAs are Whitsunday Regional Council (WRC) and Isaac Regional Council (IRC). The majority of the NGBR Project (approximately 260 km) will be located within the WRC LGA, while the remainder (approximately 40 km) will be located in IRC LGA. Key urban localities within the study area include Bowen, Collinsville (in WRC LGA) and Moranbah (in IRC LGA).

For the economic assessment the Mackay Regional Council LGA (MRC LGA) has also been considered due to the potential to source labour, equipment and materials from Mackay, which is a regional hub and a key mining service support centre in the region. Reference has been made to the Mackay, Isaac and Whitsunday (MIW) region, to indicate instances where data for the MRC LGA has been included as part of the regional study area.

The State of Queensland

It is anticipated that other areas within Queensland have the potential to supply inputs to the NGBR Project including labour. Therefore, the State of Queensland is considered a study area as part of the economic baseline.



LEGEND

- Population Centres
- Major Port
- Highway
- Main Road
- Carmichael Project (Rail)
- Railway
- Watercourse (Major)
- North Galilee Basin Rail 1000m Corridor
- North Galilee Basin Rail 100m Corridor

1:1,100,000 Paper Size A4

0 9 18 36

Kilometres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

N

Adani Mining Pty Ltd
North Galilee Basin Rail Project

Job Number	41-26457
Revision	B
Date	30 Aug 2013

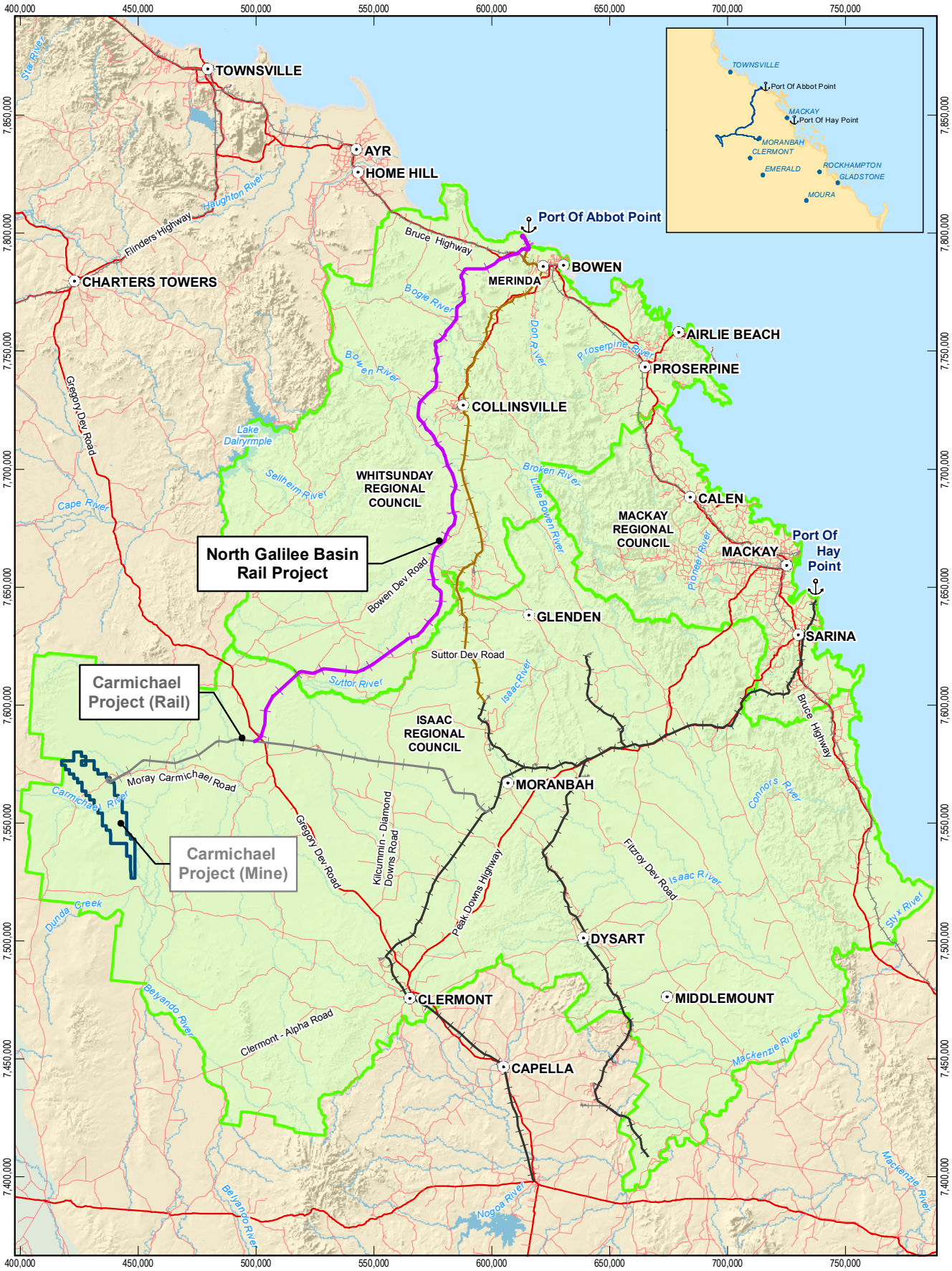
Local study area

Figure 16-1

G:\41\26457\06 GIS\Maps\MXD\1300_SIA\41_26457_1303_rev_b.mxd

Level 9, 145 Ann Street Brisbane QLD 4000 Australia T 61 7 3316 3000 F 61 7 3316 3333 E bnemail@ghd.com W www.ghd.com

Data source: GA: Populated Places, Railway, Watercourse/2007; Adani: NGBR Corridor 13/05/2013; DNRM: Roads/2010; DNRM: Cadastre/2013. Created by:MS



LEGEND

- Town
- Major Port
- Other Rail Network
- Goonyella System
- Newlands System
- Major Road
- Minor Road
- Watercourse
- Local Government Area
- Carmichael Project (Rail)
- Carmichael Project (Mine)
- North Galilee Basin Rail

1:2,300,000 (at A4)

0 10 20 30 40 50

Kilometres

Map Projection: Universal Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA)
Grid: Map Grid of Australia 1994, Zone 55

N

Adani Mining Pty Ltd
North Galilee Basin Rail Project

Job Number 41-26457
Revision A
Date 29 Aug 2013

Regional Study Area

Figure 16-2

G:\41\26457\06 GIS\Maps\MXD\0001_Overview\41_26457_0010_rev_a.mxd

Level 9, 145 Ann St Brisbane QLD 4000 T +61 7 3316 3000 F +61 7 3316 3333 E bnemail@ghd.com W www.ghd.com

Data Source: © Commonwealth of Australia (Geoscience Australia): Town, Railways, Watercourses (2007); DNRM: LGA, (2011), Hillshade (2009); DMR: State Roads (2008); DME: EPC1690 (2010), EPC1080 (2011); Adani: Alignment Opt9 Rev3 (2012), NGBR: Alignment Opt6 Rev 2 (2013).

16.2.2 Data sources

This social baseline report relied on the following data sources:

- North Galilee Basin Rail Concept Design Report (Aarvee Associates 2013)
- Land Access Report – NGBR Corridor (Ranbury 2013)
- Stakeholder consultations with regional councils, State agencies and community groups (refer Volume 2 Appendix B Public consultation)
- Australian Bureau of Statistics (ABS) – Population Census 2011, Agriculture Census 2011, Australian National Accounts and Household Expenditure Survey
- Queensland Government Office of Economic Development and Statistical Research (OESR) projections and estimates
- WRC and IRC websites
- Department of Natural Resources and Mines (DNRM) and Department of State Development, Infrastructure and Planning (DSDIP) land use mapping
- Community plans, including:
  - Mackay, Isaac and Whitsunday Regional Plan 2012
  - Whitsunday Regional Council Community Plan 2011 - 2021: Our Conversation with our community
  - Isaac Regional Council Isaac Region 2020 Vision 2009 - 2019 (Community Plan)
- State of Queensland publications including:
  - Shaping Tomorrow's Queensland 2010
  - Queensland Regionalisation Strategy 2011
- State of Queensland publications and websites on:
  - Health
  - Housing
  - Major projects
  - Community and emergency services
- Review of media articles relating to the regional study area and similar projects
- Other relevant social impact assessment reports such as Carmichael Coal Mine and Rail Project, Alpha Coal (Rail) Project, Northern Missing Link and China First Coal Project for impacts identified for similar linear projects or projects being undertaken in the region.

16.2.3 Legislation and guidelines

Legislation and guidelines relevant to the social and economic baselines and impact assessment are as follows:

- State Development and Public Works Organisation Act 1971
- Environmental Protection Act 1994
- Queensland Government's Co-ordinator General's (CGs) Social Impact Assessment Guidelines 2013

- International Association for Impact Assessment's (IAIA), International Principles for Social Impact Assessment (IAIA 2003).
- Queensland Government CoalPlan 2013
- Queensland Resources Council Queensland Resources and Energy Sector Code of Practice for Local Content 2013.

An explanation of the above legislation and how it applies to the NGBR Project is provided in Volume 1 Chapter 20 Legislation and approvals.

16.2.4 Existing environment

A social and economic baseline was developed to establish a base case and provide a point from which the impacts of the NGBR Project could be reported against. Information was collected on the current status of the region's population and the state of its economy. Historical data was analysed to identify trends as required under the TOR.

Separate social baselines were prepared for the relevant study areas, resulting in a local study area baseline (refer Volume 2, Appendix M Section 3 Social Baseline) and a regional study area baseline (refer Volume 2, Appendix M Social baseline).

The local study area baseline was developed from a combination of desktop data sources and consultation, to describe the existing properties and lifestyle of landowners.

The regional study area baseline was developed from desktop data sources. Regional baseline data was compared to data from the state study area where relevant. This information was collated to describe the following:

- Community settlement patterns
- Land valuation
- Housing availability, affordability and costs
- Residential and non-residential building approvals
- Community values and aspirations
- Demographic characteristics, including:
  - Total population; population trends, growth and forecasts
  - Full Time Equivalent[1] (FTE) population estimates (resident and non-resident population)
  - Age and gender profile
  - Family composition
  - Cultural and ethnic composition
  - Education profile, including school and vocational training enrolments
  - Employment and unemployment profile, including industry and occupation profile
  - Income profile
  - Crime rate
  - Social health and wellbeing

[1] The FTE population measure is the sum of the estimated resident population (people who live in the area permanently) and the number of non-resident workers on-shift. The FTE population provides a better measure of total demand for certain services and infrastructure in regions with a high incidence of FIFO/DIDO workers (OESR, 2013a).

  - Social and economic index of disadvantage
- Employment and unemployment profiles
- Regional industry profiles
- Gross Regional Product (GRP) across MIW region
- Social and community infrastructure, including:
  - Housing and accommodation services and facilities
  - Health services and facilities
  - Emergency services
  - Community support services
  - Education and training facilities
  - Transport services
- Lifestyle and recreation.

Scoping of Issues

An initial scoping of impacts and opportunities was undertaken for both the construction and operation phases of the NGBR Project to develop an understanding of the range of issues that may need to be assessed. The issues identified at this stage were considered preliminary to the assessment and allowed for the development of targeted existing environment studies and stakeholder consultations to be undertaken. It is acknowledged that issues raised at this stage included both real and perceived issues (i.e. impacts that may actually occur, or may be perceived to occur by stakeholders) which were refined through further assessment. The scoping exercise was also used to identify key local and regional stakeholders.

16.2.5 Impact assessment

Economic assessment

NGBR Project project-related expenditure during construction and operation will be captured predominantly within the MIW region. This expenditure potentially creates changes in economic indicators such as employment and economic output. A quantification of these changes is used to describe impacts the likely impacts to local or regional economies. Predicted estimates of economic change associated with the NGBR Project are based on the use of an input-output (I-O) method. I-O analysis provides a comprehensive economic framework that provides a numerical picture of the size and shape of the economy and its essential features. Economic indicators, which provide a picture of economic activity in a region resulting from a specific activity, can be considered at two levels, direct/initial change or indirect change.

Direct/initial change is the change in final demand or level of economic activity generated by the development. Indirect change is the total of:

- Production induced change – purchasing goods and services from other industries and employment
- Consumption induced impacts – additional output and employment stemming from the consumption of additional goods and services by households that are the result of increased wages or employment in the development and associated activities
- Offset consumption effects – the lost consumption by the local unemployed before they take a new job and the lost consumption of those who have lost a job before they start receiving welfare payments.

Direct and indirect flows into affected economies are aggregated in order to ascertain the total impact. Economic impacts GRP and employment are assessed at the regional and state levels during both the construction and operation phases of the NGBR Project.

The indirect impacts were calculated using the I-O models constructed for the NGBR Project and they measure the economic effects in other sectors of the economy generated by direct activities, that is, the multiplier effects. In addition to the assumptions embodied in the I-O model itself (refer Volume 2 Appendix N Economics), it was necessary to make a number of other general assumptions in estimating the economic effects:

- The impacts were measured using models that represent the structure of the regional and state economies for the year in which the most recent data are available (2011/12). However, over time there are likely to be improvements in primary factor productivity in these economies. To allow for these improvements, an across-the-board (all sectors) labour productivity improvement rate of one per cent per annum for subsequent years has been incorporated into the modelling.
- When new jobs are created, it should be determined where the people come from to fill those jobs. In some cases, these jobs will be taken by previously unemployed locals or by someone who is currently employed locally but whose own job is taken by a previously unemployed local. In both cases, the impact of the newly created job and associated income is partially offset by the fact that someone who was previously receiving unemployment benefits is no longer doing so. To calculate this effect requires estimates of the parameter rho (refer Volume 2 Appendix N Economics). Rho represents the proportion of new jobs that are likely to be filled by previously unemployed locals. For the construction phase, rho was estimated to be 50 per cent for the local area and 60 per cent for Queensland as a whole.

Model outputs can be used to predict changes to:

- GRP – a measure of the value of a region's outputs minus the cost of inputs. It is therefore able to measure the net contribution of the NGBR Project to the relevant economies (i.e. the MIW region and Queensland).
- Employment - identifies the number of FTE persons engaged in work within a region. In this assessment, employment is measured by place of remuneration rather than place of residence.

It was assumed that over the life of the NGBR Project 75 per cent of the capital investment for the construction of the NGBR Project will occur in the MIW Region and 15 per cent elsewhere in Queensland. The remaining capital expenditure (10 per cent of the total) is assumed to occur outside Queensland or overseas. This is consistent with other rail projects including the assumption made for Adani's Carmichael Coal Mine and Rail Project's rail line to connect from the Carmichael Mine to the existing Goonyella rail system.

It was assumed that over the life of the NGBR project, 70 per cent of operation expenditure will occur in the MIW region, 23 per cent outside the MIW region but still in Queensland and seven per cent outside Queensland or overseas.

The impact of the NGBR Project on these indicators at the regional level and for the State of Queensland is presented in Section 16.5.

Social assessment

A social impact identification and assessment process was carried out for the construction and operation phases of the NGBR Project. To carry out the impact assessment the following considerations were applied:

- The direct impacts arising from the NGBR Project were assessed in accordance with the Social Impact Assessment Guidelines (July, 2013) (Queensland Government, 2013a)
- The significance of social impacts were identified using a risk matrix consistent with the Social Impact Assessment Guidelines as shown in Table 16-1.
- Clearly setting out the likely cause/effect relationships between each action and impact
- Taking a conservative or 'expected case' approach by assuming the most likely consequence
- Where the expected case scenario indicates extreme or high impacts, developing mitigation measures to address the expected case scenario
- Where the expected case scenario indicates moderate impacts, developing a robust monitoring program to verify the extent of the potential impact over the life of the NGBR Project.

The social impacts for the NGBR Project have been described in terms of:

- The potential change to existing conditions or characteristics of the local, regional and state study area as a result of the NGBR Project being developed
- The extent to which this change may impact stakeholders or social infrastructure, with regard to characteristics of each community grouping and the current status of community services and infrastructure.

Table 16-1 presents the social impact risk matrix used for the NGBR Project social impact assessment. Table 16-2 and Table 16-3 provide definitions for degrees of likelihood and consequence used for the risk matrix in Table 16-1.

Table 16-1 Social impact risk matrix

Likelihood	Consequence				
	Catastrophic	Major	Moderate	Minor	Insignificant
Almost certain	Extreme	Extreme	High	Medium	Medium
Likely	Extreme	Extreme	High	Medium	Medium
Possible	High	High	Medium	Medium	Low
Unlikely	High	Medium	Medium	Low	Low
Rare	Medium	Medium	Medium	Low	Low

Table 16-2 Definitions of likelihood of impact

Likelihood	Definition
Almost certain	Frequency of occurrence expected to exceed 95% Impact is occurring now or could occur within months
Likely	Frequency of occurrence expected to be 50% to 95% Will probably occur in many circumstances Could occur annually
Possible	Frequency of occurrence expected to be 20% to 50% May occur some of the time but a distinct possibility it would not Could occur in the next 2 to 5 years
Unlikely	Frequency of occurrence expected to be 5% to 20% May occur in some circumstances but not anticipated Could occur once in the next 5 to 30 years
Rare	Frequency of occurrence expected to be < 5% Only likely to occur in exceptional circumstances Not likely to occur in the next 30 years

Table 16-3 Definitions of consequence of impacts

Consequence	Definition		
	Environment	Health and safety	Community and reputation
Catastrophic (5)	Extensive long term environmental harm and/or harm that is extremely widespread. Significant resources required to respond to the incident and rehabilitate. Impacts unlikely to be reversible within 10 years.	Multiple fatalities and/or significant irreversible effects to 10s of people	Irreversible changes to social characteristics and values of the communities of interest or community has no capacity to adapt and cope with change.
Major (4)	Major or widespread, unplanned environmental	Single fatality and/or severe disability	A long-term recoverable change to social characteristics and values of

Consequence	Definition		
	Environment	Health and safety	Community and reputation
	impact on- or off-site. Degradation of overall conservation status of ecosystems. Significant resources required to respond and rehabilitate. Impacts are reversible within 5 to 10 years.	(permanent disabling injury) or illness to one or more persons	the communities of interest/community has limited capacity to adapt and cope with change. Long-term opportunities emanating from the NGBR Project.
Moderate (3)	Moderate, unplanned environmental impact contained within the mining lease/ rail corridor or minor impact that is off-site. Unplanned impacts do not result in degradation of overall conservation status of ecosystems. Resources will be required for responding to the incident and implementing mitigation measures over a period of time. Impacts are reversible within 1 to 5 years.	Serious bodily injury or illness (e.g. fractures) and/or lost time injury > 2 weeks.	Medium-term recoverable changes to social characteristics and values of the communities of interest or community has some capacity to adapt and cope with change. Medium term opportunities emanating from the NGBR Project.
Minor (2)	Minor, unplanned localised environmental impact, contained within the mining lease/ rail corridor or with negligible off site effects. Planned or unplanned impacts do not result in degradation of overall conservation status of ecosystems. Minor resources required to respond to the incident. Impacts are reversible within a year.	Medium-term, largely reversible injury or illness to one or more persons. Restricted work injury. Lost time injury < 2 weeks.	A short-term recoverable change to social characteristics and values of the communities of interest or community has substantial capacity to adapt and cope with change. Short-term opportunities emanating from the NGBR Project.
Insignificant (1)	Negligible, reversible environmental effect. Any impacts are contained within the mining lease/ rail corridor and are short -term in nature. Minimal resources required to respond to an incident.	First aid treatment or medical treatment in hospital.	Local, small-scale, easily reversible change on social characteristics or values of the communities of interest or communities can easily adapt or cope with change. Local small-scale opportunities emanating from the NGBR Project that the community can readily pursue and capitalise on.

Impact avoidance, mitigation and management strategies

Once potential social impacts and opportunities were identified, appropriate mitigation measures and management strategies and monitoring programs were developed. Additionally, a number of impact avoidance measures were also developed as part of NGBR Project design. As per the CGs Social Impact Assessment Guidelines (July 2013) (Queensland Government, 2013a) the management strategies were based on the following considerations:

- Focused on mitigating direct impacts arising from the NGBR Project, particularly those identified as high risk in the impact assessment
- Adopting adaptive management principles in order to be responsive to changes to the social context
- Feedback from the stakeholder engagement process. The CGs Office, IRC, WRC, regional service providers, community groups, landholders and regional development organisations were involved in the development of management strategies and monitoring programs to ensure that measures are practicable for all parties. Management strategies were developed to align with any identified existing programs where appropriate and will be refined as the NGBR Project progresses.

The social impact mitigation and management strategies developed for the NGBR Project are detailed in Section 16.6.

The proposed mitigation and management strategies were assessed against the potential impacts to determine the likelihood of any residual impacts. Where relevant, further management measures were identified to address the residual impacts; these are discussed in Section 16.6.

16.2.6 Stakeholder consultation

Stakeholder consultation is a critical part of the social impact assessment process. Meaningful engagement with communities of interest helps to develop a strong foundation for the process, recognising local knowledge, experience, customs and values. Stakeholder consultation for the social impact assessment was undertaken to:

- Establish contact with key stakeholders and providing them with updated information about the NGBR Project
- Verify desktop information collected for the social baseline
- Understand existing community and landholder issues for the purpose of the social baseline
- Identify and/or verify social impacts and opportunities that could potentially arise from the NGBR Project
- Identify avoidance, mitigation measures and management strategies to address impacts
- Identify potential roles and responsibilities of stakeholders in addressing impacts.

The consultation activities included face to face meetings and phone meetings with a range of stakeholders including CGs Office, IRC, WRC, State agencies, service providers, conservation groups, local businesses, community groups and landholders. Further details of the consultation activities and outcomes are provided in Volume 2 Appendix B Public consultation.

16.2.7 Limitations

The economic baseline and economic modelling have been underpinned by the following assumptions:

- Industries in the model have a linear production function, which implies constant returns to scale and fixed input proportions
- Firms within a sector are homogeneous, which implies they produce a fixed set of products that are not produced by any other sector and that the input structure of the firms are the same. Thus it is preferable to have as many sectors as possible specified in the models and the standard models for this study were compiled with 66 sectors
- The model is a static model that does not take account of the dynamic processes involved in the adjustment to an external change, such as a permanent change in natural resources management.

The following considerations have bounded the scope of the social baseline and impact assessment:

- The social baseline and the impact assessment was prepared on the basis of information provided by Adani and other NGBR Project stakeholders including Government agencies
- The social impacts for the construction and operation phases of the NGBR Project are predicted at a point in time, based on the existing social, cultural, economic conditions and community concerns and aspirations at the time of the assessment
- It is acknowledged that with time, changes to the social and economic characteristics of the study area and changes in the Commonwealth, State, regional and local policies and planning frameworks, may influence the context in which the social impact assessment was undertaken, which may prompt alterations to impact assessment
- Given that the NGBR Project has a 90 year life span, it can be expected that the manner in which the NGBR Project is operated will also change with time (e.g.as new transportation technologies are identified) and demand for coal. Such changes will potentially alter the social impacts arising from the NGBR Project.

16.3 Existing environment

16.3.1 Local study area

The local study area includes 27 leasehold lots, 36 freehold lots and one lot classified as unallocated state land. The local study area is sparsely populated and the NGBR Project seeks to avoid or mitigate close contact with homesteads. A total of 23 homesteads were identified within approximately six kilometres of the final rail corridor for the NGBR Project.

The majority of the local study area is used for agriculture related activities. Common activities in the local study area include cattle breeding, cattle grazing and horticulture. Some properties located near Collinsville comprise both mining and farming related activities, with the Glencore Xstrata Collinsville Mine being a dominant feature within the area.

Most farming in the local study area is undertaken by families residing on the properties within the local study area. A small number of people are employed to assist with general farming activities and a range of contractors are engaged at different times to support with specialist activities such as mustering.

The NGBR Project final rail corridor intersects seven gazetted stock routes. Stock routes are corridors on roads, reserves, pastoral leases and unallocated state land along which stock are driven on foot. The NGBR Project final rail corridor also traverses the Bicentennial National Trail, which is a multi-use recreational trekking route and a national tourist attraction. The trail follows local rivers from the Burdekin Falls Dam to Collinsville, and crosses the final rail corridor near Pelican Creek at approximate chainage 106.05 km. For more information on the land use in the local study area refer to Volume 2, Appendix C Land use and tenure.

NGBR Project consultation (refer Volume 2 Appendix B Public consultation) with landholders and the Corridor to Coast Group confirmed:

- A strong connection of landholders and their families to their properties. For some landholders this connection and identity is based on generations of owning and running the farming practices on the properties. Some properties were settled in the late 1800s by the current owner's predecessors. The majority of the landholders reside on the property themselves or have extended family living on their properties.
- Landholders value and appreciate the rural lifestyle associated with large scale grazing land. Landholders are proud of their properties and strongly value the effort they have made in developing and nurturing the land
- The relative seclusion of their location is seen as an advantage as it offers them privacy as well as the convenience of being located less than two hours driving distance from the nearest township (e.g. Bowen, Collinsville or Moranbah), which are accessed as supply and business centres. Generally only the elderly or medically challenged landholders relocate to regional or coastal towns
- Landholders place high importance on their social networks and working together with their families and neighbours. Much of the social networking centres around rural based activities such as country races, competition camp drafting (horse and stock) and related activities.
- Most of the landholders are either related to or maintain strong networks with other landholders based in the area or who have been directly affected by other resource developments.

16.3.2 Regional study area

As defined in Section 16.2.1, the regional baseline focuses on the community characteristics for the WRC LGA and IRC LGA and the key urban localities located within the study area namely Bowen, Collinsville and Moranbah. The MRC LGA has also been considered from an economic perspective due to the potential to source labour, equipment and materials from Mackay. Reference has been made to the MIW region, to indicate instances where data for the MRC LGA has been included as part of the regional study area.

Overview of the Whitsunday Regional Council

The WRC was formed in 2008 after the amalgamation of the Bowen and Whitsunday Shire Councils. The region covers an area of 23,871 km² with a total population of approximately 33,295 people in 2012 which is expected to increase at a rate of 2.2 per cent and 22,156 people by 2031 (Queensland Government 2012; OESR 2013e; OESR 2013f). The WRC LGA is a culturally diverse region that includes Aboriginal and Torres Strait Islander populations. The values, identity and aspirations of the WRC LGA community are summarised in Table 16-4.

Table 16-4 Community values, identity and aspirations in the WRC LGA

LGA/Urban centre	Values, identity and aspirations
WRC	• Is well governed and financially sustainable • Promotes sustainability and long term sustainable development • Has the infrastructure needed to meet ever changing needs both now and in the future • Promotes and preserves culture and history • Protects past, but promotes future • Is vibrant, safe and inviting • Protects precious natural resources and environment • Is proactive, healthy and encourages participation in physical activity • Has the infrastructure and facilities which promote and encourage a healthy and active lifestyle • Is accessible by all and promotes inclusivity • Has access to government services and opportunities • Is proud of its identity and its people • Is built around sustainable planning principles and outcomes.
Bowen	• Has a strong sense of community with strong ties to the land and the region • Values the environment and recognises that its plays a key role in the identification to the region • Identifies Bowen as a place where the beach meets the bush • Prides itself on its agricultural produce and relaxed beach lifestyle • Wants the area to grow and develop, however not at the cost of community diversity or by displacing people who already live in the area.
Collinsville	• Has a strong sense of community and is proud of its place • Is dependent on the mining industry • Prefers project-related workforces to be located in town (not in accommodation camps) so that workers form part of the local population • Are keen for more projects to boost the economy and revitalise the community.

Source: Whitsunday Regional Council 2011

Bowen

Bowen was settled in the 1860s as a pastoral town and was located in the Bowen Shire Council prior to its amalgamation with the Whitsunday Shire Council in 2008. Initially land was used mainly for cattle grazing and timber gathering (Queensland Places 2013a). Growth and development of Bowen was influenced by mining and improved access from the early 1900s. Today, Bowen is a commercial, business, service and administrative hub for the northern section of the WRC and is the largest town in the WRC LGA. Bowen's local economy is based on a nationally significant horticulture industry, commercial fishing, aquaculture and a major salt

processing facility (Queensland Government 2012). There are a number of emerging economic opportunities for Bowen and its surrounds due to the expansion of the Port of Abbot Point (approximately 20 kilometres from Bowen). Opportunities include export of bulk commodities, large-scale industrial development, freight and logistics (Queensland Government 2012).

Table 16-5 provides a snapshot of key demographic data for Bowen. Data presented for Bowen and other key urban centres in the regional study area is presented at Statistical Area Level 2 (SA2) as per ABS Census 2011. SA2 is defined as a general purpose medium-sized area that represents a community that interacts socially and economically.

Table 16-5 Key population characteristics for Bowen SA2

Data type	Key statistics
Population	Estimated total population in 2011 of 9,076 persons, increasing from 8,871 persons in 2007. Projected population of 15,755 persons by 2031 – an increase of 5,816 at a growth rate of 2.3 per cent per annum (2011-2031).
Age and gender	High proportions of working age groups with 25.4 per cent aged 25-44 years and 28.3 per cent aged 45-64 years. Median age of 39.4 years.
FTE population and % of non-resident workers	In 2011, FTE population was 13,935 of which 710 persons (5.1 per cent) were non-resident workers. The FTE population in Bowen increased in 2012 to 13,985 persons, of which 741 persons (5.3 per cent) were non-resident workers.
Indigenous population	Indigenous population of 654 persons at 7.4 per cent of the total population.
Family composition	In 2011, there were 2,186 families in the area. 'couple family with no children' are the dominant family type with 45 per cent, 38.1 per cent 'couple family with children', and 15.7 per cent 'one-parent families'.
Occupation and industry of employment	In 2011 unemployment was 8.9 per cent with 465 unemployed persons in the 5,241 person labour force. In 2011, the main industries of employment were agriculture, forestry and fishing (12.7 per cent), retail trade (10.3 per cent), and mining (5.4 per cent). The largest occupation categories were labourers (21.3 per cent) and technicians and trades workers (17.0 per cent).
Income	33.5 per cent recorded incomes of $400-$999 per week and 32.5 per cent recorded less than $400 per week.

Source: OESR 2012 and OESR 2013g data from ABS Census 2011

Collinsville

Collinsville is located about 270 km north-west of Mackay, in the former Bowen Shire area of the WRC. The area was first settled in the 1860s as a grazing area with the establishment of the

Strathmore Station. Collinsville was originally known as Moongunya which is the Aboriginal name for coal (WRC 2013b). The town of Collinsville was established in 1866 as a coal mining town spurring gradual growth in the area (Rolfe 2011). The population however remained low until the earlier years of the 20th century, when modern Collinsville was developed on advice from the Town Planning Association in 1922 (Queensland Places 2013b). Today it serves as the WRC's main mining centre (WRC 2011). It services the local community and the surrounding region with commercial, administrative, health and educational facilities and services.

The following Table 16-6 provides a snapshot of the key demographic data for Collinsville to inform the social baseline.

Table 16-6 Key population characteristics for Collinsville SA2

Data type	Key statistics
Population	Estimated total population in 2011 of 4,141 persons, decreasing from 4,299 persons in 2007. Preliminary 2012 population estimate of 4,195 persons. Projected population of 6,439 persons by 2031 – an increase of 4,717 at a growth rate of 1.6 per cent per annum (2011-2031).
Age and gender	High proportions of working age groups with 26.4 per cent aged 25-44 years and 28.3 per cent aged 45-64 years. Median age of 38.8 years.
FTE population and % of non-resident workers	In 2011, the FTE population in Collinsville was 2,095 persons of which 555 persons (26.5 per cent) were non-resident workers. The FTE population in Collinsville increased in 2012 to 2, 145 persons of which 600 persons (28 per cent) were non-resident workers.
Indigenous population	Indigenous population of 210 persons at 5.2 per cent of the population.
Family composition	In 2011, there were 987 families in the area. 'Couple family with no children' are the dominant family type with 45.5 per cent, 42.2 per cent 'couple family with children' and 11.1 per cent 'one-parent families'.
Occupation and industry of employment	In 2011 unemployment was 5.4 per cent with 131 unemployed persons in the 2,412 person labour force. In 2011, the main industries of employment were agriculture, forestry and fishing (21.9 per cent), mining (18.4 per cent), and construction (8.4 per cent). Largest occupation categories were machinery operators and drivers (20.8 per cent), labourers (18.2 per cent), manager (17.0 per cent), and technicians and trades workers (16.3 per cent).
Income	32.6 per cent recorded incomes less than $400 per week and 27.3 per cent recorded incomes of $400-$999 per week.

Source: OESR 2012 and OESR 2013g data from ABS Census 2011

Overview of Isaac Regional Council

IRC was formed in 2008 with the amalgamation of Belyando, Broadsound and Nebo Shire Councils. The IRC LGA covers 58,862 km^2, with a population of approximately 23,000 people in 2011 (Queensland Government, 2012). It is a fast growing LGA and the population is expected to increase significantly in the future, with a projected increase of approximately 14,000 additional people at 2.3 per cent by 2031 (Queensland Government, 2012). The values, identity and aspirations of the IRC LGA community are summarised in Table 16-7.

Table 16-7 Community values, identity and aspirations in the IRC LGA

LGA/Urban centre	Values, identity and aspirations
IRC	• Values its diverse lifestyles, environment, essential services and places importance on regional arts, cultural and heritage development • Aims to maintain their harmony and quality of life • Places a high importance on community spirit, country town living, safe and secure environments, community cohesion and friendliness • Chose to live in the IRC LGA for its community, lifestyle and liveability reasons • Understands that many people have come to the IRC LGA in search of work opportunities in the coal mining industry and the Council is now focussed on getting these people to stay in the region by offering a quality of life that surpasses other regions
Moranbah	• Places a high emphasis on the importance of outdoor community facilities that promote the area's active, healthy outdoor living • Is focused on community and environmental sustainability and aims to continue to diversify economic contributions to the region in order to maintain the region's economic sustainability • Wants workers who are working in the mining industry to move to Moranbah with their families to contribute to the quality of life of the town and reduce the proportion of non-resident workforce. This workforce currently impacts on local services and infrastructure.

Source: Isaac Regional Council 2009 and Queensland Government 2012

Moranbah

Moranbah is a purpose-built mining town established in the 1970s and is located 191 km west of Mackay. It is the major regional activity and service centre for the Bowen Basin mining industry and according to the *Mackay, Isaac and Whitsunday Regional Plan 2012 (MIWRP)*, Moranbah will continue to play this role. It is the town centre closest to Goonyella, Peak Downs and Riverside Mines with a railway to the Hay Point coal loading terminal near Mackay (Rolfe, 2011). It provides a range of social and community infrastructure and facilities including health, education and training, shopping, information/knowledge centres, sports, recreation, places of worship, emergency services, employment services, repair mechanics and food and beverage outlets (IRC 2013b).

The following Table 16-8 provides a snapshot of key statistics for Moranbah to inform the social baseline.

Table 16-8 Key population characteristics for Moranbah SA2

Data type	Key statistics
Population	Estimated total population in 2011 of 9,223 persons, increasing from 8,029 persons in 2007. Preliminary 2012 population estimate of 9,285 persons. Projected population of 15,253 persons by 2031 – an increase of 6,404 persons at a growth rate of 2.8 per cent per annum (2011-2031).
Age and gender	High proportions of working age group with 38.4 per cent aged 25-44 years. 26.9 per cent aged 0-14 years a reflection of the high number of couple families with children. Median age of 29.7 years.
FTE population and % of non-resident workers	In 2011, the FTE population in Moranbah was 11,680, of which 2,803 persons (24 per cent) were non-resident workers. In 2012 the FTE population in Moranbah increased to 13,575 persons, of which 4,588 persons (33.8 per cent) were non-resident workers.
Indigenous population	Indigenous population of 234 persons at 2.6 per cent of the population.
Family composition	In 2011, there were 2,122 families in the area. 'couple family with children' are the dominant family type with 61 per cent, 29.5 per cent 'couple family with no children', and 9.1 per cent 'one-parent families'.
Occupation and industry of employment	In 2011 unemployment was 1.3 per cent with 74 unemployed persons in the 5,590 person labour force. In 2011, the main industries of employment were mining (44.2 per cent) and construction (7 per cent). The main industries of employment were reflected in the largest occupation groups of technicians and trades workers (24.8 per cent) and machinery operators and drivers (23.1 per cent).
Income	28.6 per cent of the population recorded weekly incomes of $2,000 or more and 23.0 per cent recorded $1,000-$1,999 per week. This is indicative of higher salaries in the mining sector.

Source: OESR 2012 and OESR 2013g data from ABS Census 2011

Overview of Mackay regional council

The MRC was established in 2008 by the amalgamation of Mackay City, Mirani Shire and Sarina Shire Councils (Queensland Places 2013c). The MRC LGA comprises of Mackay as the urban centre for the region, with smaller towns including Sarina, Mirani, Marian and Walkerston providing district and local services (Queensland Government 2012).

The MRC LGA covers an area of 7,621km^2 and had a population of approximately 121,400 with an average annual growth rate of 2.6 per cent during the period 2006 to 2011 (Queensland Government 2012). The MRC LGA's population is expected to grow significantly over the next 20 years with an increase of approximately 66,000 people by 2031. According to Tomorrow's

Mackay – The Community Plan 2011 – 2031, the MRC LGA's current growth is fuelled by the booming mining industry in the Bowen Basin, along with a resurgence in agribusiness, growth in tourism and an emerging maritime sector and growing retail sector (MRC 2013). The Mackay urban area had an estimated resident population of 78,200 people in 2011 and is the major regional centre servicing the MRC LGA and wider MIW region. The Mackay urban area has high population growth with an annual growth rate of 3.3 per cent recorded between 2004 and 2009. This growth rate was significantly higher than the Queensland average of 2.6 per cent during the same period (Queensland Government 2012).

It is expected that NGBR Project inputs including labour, equipment and materials will be sourced from Mackay—the regional hub and a key mining service support centre in the region.

Mackay provides the region with government administration, retail, commercial and specialised personal and professional services and major employment opportunities. High order services and functions including a university campus, base hospital and the region's main air and seaports are also provided in Mackay (Queensland Government 2012). In recent years there has been significant investment in public infrastructure in the city centre including the Mackay Entertainment and Convention Centre (locally known as the MECC), art gallery and swimming lagoon (Queensland Government 2012).

Mackay, Isaac and Whitsunday region

Population

OESR reports that the population of the MIW region was 175,702 in 2012. The region experienced an average annual population growth rate of 2.25 per cent between 2001 and 2012. The population grew annually at a rate of 3.05 per cent from 2001 to 2006 and 1.61 per cent from 2007 to 2012.

The population of the MIW region increased by 4,405 persons (2.57 per cent) between 2011 and 2012. This was higher than population growth in Queensland over the same period which increased by 1.92 per cent.

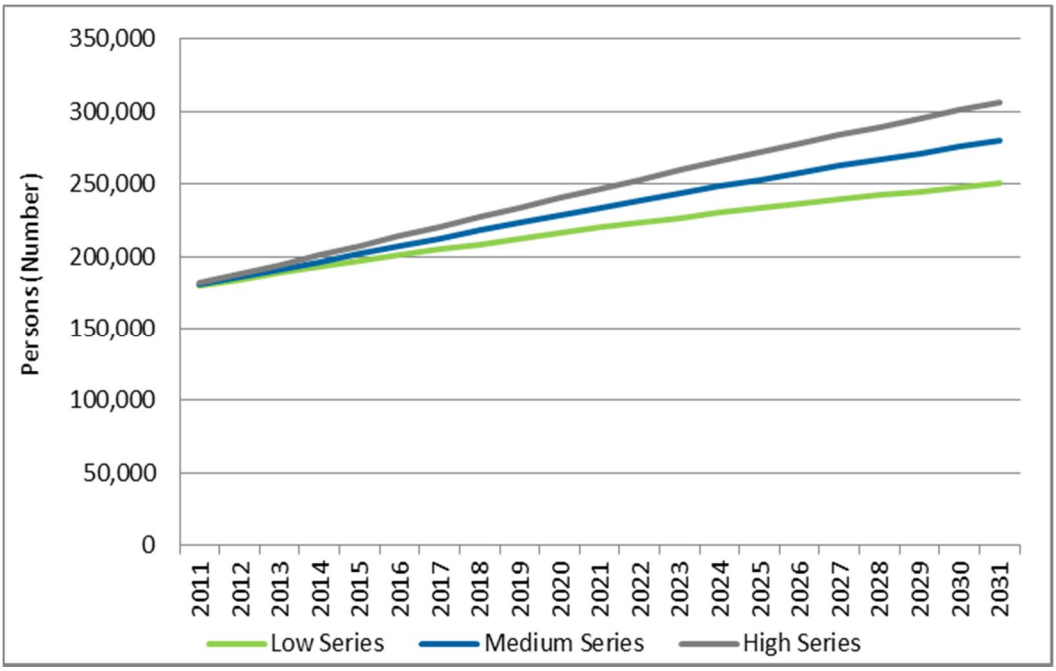
The estimated resident population of WRC LGA in 2012 was 33,295 persons, which was an increase of 887 persons or 2.7 per cent since 2011. The IRC LGA experienced a population growth rate of 2.1 per cent which reflected as increase of 476 persons between 2011 and 2012. Both WRC LGA and IRC LGA have experienced steady increases in population since 2001.

According to the MIWRP (2012), population increase is likely to be attributed to the growth in the resources sector across the MIW region.

Population growth within the region is forecast to continue to increase. Average annual population growth between 2011 and 2031 as projected by the OESR under a high, medium and low growth scenario as depicted in Figure 16-3.

- High growth scenario – 2.64 per cent per annum
- Medium growth scenario – 2.22 per cent per annum
- Low growth scenario – 1.67 per cent per annum

Figure 16-3 MIW region projected population growth



Source: OESR, 2013b

The WRC LGA is expected to grow at an average annual growth rate of 2.2 per cent, resulting in an increase of approximately 19,708 persons between 2011 and 2031. According to the MIWRP, growth in the WRC LGA, particularly in the township of Bowen will largely be attributed to the development in construction and mining activities which are in turn anticipated to be a direct consequence of the infrastructure expansion and upgrades to the Port of Abbot Point (Queensland Government 2012).

The average annual growth rate in IRC LGA is expected to be 2.3 per cent resulting in an additional 13,723 persons during the period. This is reflective of the projected population growth for the area, which will result in a considerable increase in population of the IRC LGA. It is anticipated that the majority of IRC's population growth to 2031 will be accommodated in Moranbah due to the availability of employment opportunities and increasing levels of urban services and infrastructure (Queensland Government 2012). These projections align with the medium projected growth scenario for the MIW region.

Non-resident population

The term 'non-resident worker' is used to distinguish people who are not residents of the local area where they regularly work (OESR 2012). A non-resident worker differs from other short-term or casual visitors to the area in that:

- The duration of their stay in the area is extended and regular. This usually takes the form of a period of work followed by a rest interval at their place of usual residence
- While living in the area, the worker typically stays in commercial accommodation (hotels, motels or caravan parks) or in worker accommodation facilities which are a commonly used accommodation solution, and may be located in town centres or located in close proximity to the place of work

- Non-resident workers are often categorised according to their means of travel between home and place of work, either as Fly-in-fly-out (FIFO) (from outside the region) or drive-in-drive-out (DIDO) (from within the region) (OESR 2012).

The OESR has collated information on non-resident workers in LGAs and key urban centres located within the geographical boundaries of the Bowen Basin, which includes the WRC LGA (Bowen only – this comprises the SA2s of Bowen and Collinsville which cover the former area of Bowen Shire) and IRC LGA.

In 2012, the total FTE population for the WRC LGA (Bowen only) was 13,985 people, of which 735 persons (5.3 per cent) were non-resident workers.

The data shows that Collinsville has a significantly high proportion of non-resident workers as a percentage of FTE population compared to other locations in the WRC with 28 per cent (600 persons) in 2012. IRC LGA recorded the largest non-resident worker population of 17,125 people in 2012 representing almost three-quarters (73 per cent) of the total for the regional study area. Between 2011 and 2012 the number of non-resident workers in IRC LGA increased by 3,535 (26.01 per cent). The increase of non-resident workers in IRC LGA can be explained by the commencement of new mining projects and the expansion of a number of existing operation (OESR 2012).

The data confirms that, as stated in the MIWRP, the regional study area, and more specifically Collinsville and Moranbah, is characterised by a high rate of residential mobility and temporary workers as a result of seasonal and varying employment patterns in the mining, agri-horticultural and tourism industries (Queensland Government 2012).

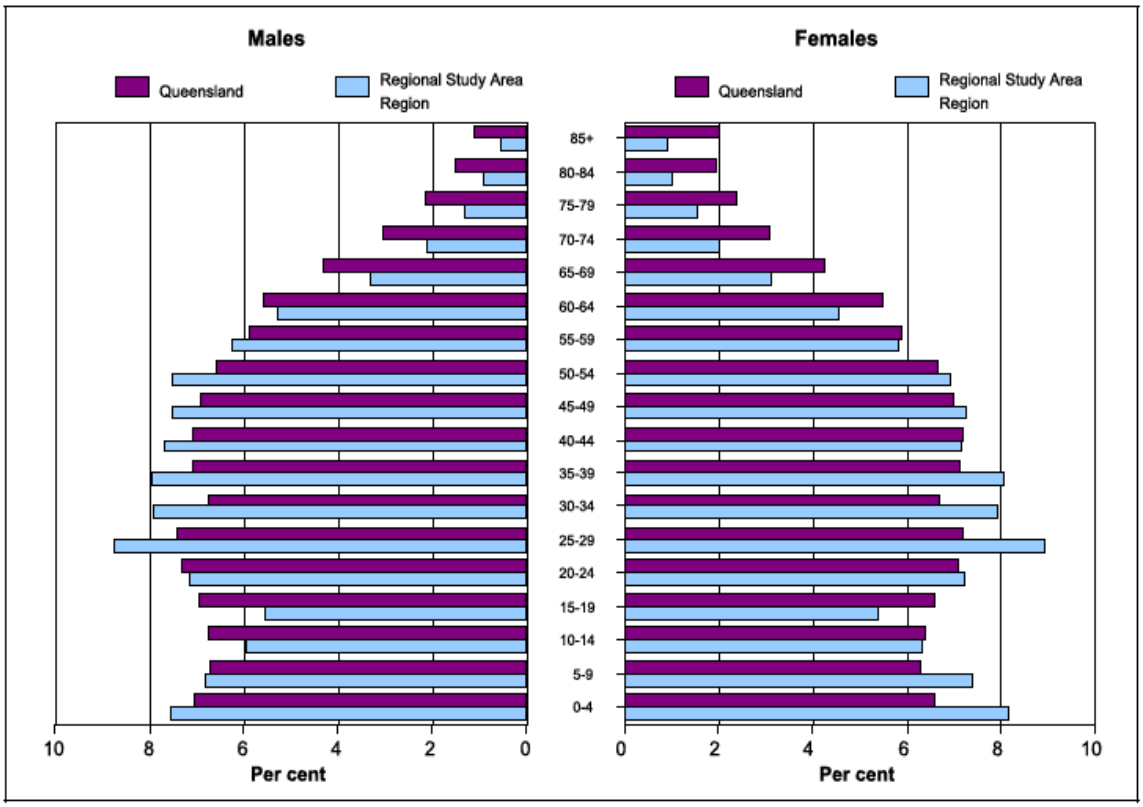
Despite the rising trend in the increased proportion of non-resident to resident workers and the increasing mining activities in the region, anecdotal information from the NGBR Project consultation (June 2013) identified that there has been a recent reduction in the non-resident population due to the change in economic conditions and the closing down of projects.

Age and gender

Although the regional study area's age and sex distribution is generally younger than the State average, there remains a wide diversity of age groups from infants and youths to adults and the elderly (refer Figure 16-4). About two-thirds of the regional study area population is aged under 45. The regional study area has a high representation of working age groups (15 to 64 years old) with 70 per cent in the WRC LGA and 71.2 per cent in the IRC LGA. This is reflective of the expansion of the mining industry in these areas.

While older persons are generally under-represented in the regional study area compared to Queensland, there was a high proportion (39.3 per cent) of males and females aged 45 and over in the WRC LGA. This age profile is also reflected in the family composition with 'couple family with no children' the dominant family type the WRC LGA.

Figure 16-4 Population by age group and sex – regional study area and Queensland June 2011



r = rebased
Source: OESR 2013e and OESR 2013f data from ABS Census 2011

Family composition

There are almost 13,000 families in the regional study area, constituting 1.1 per cent of Queensland's total population. Family composition is generally consistent with the state, and is dominated by 'couples with children' with approximately 6,000 families, followed by 'couple only' households with over 5,000 families in the regional study area. There is a slightly lower percentage of one-parent families in the regional study area compared to Queensland as a whole.

The high proportion of 'couple family with children' reflects the largest age groups of 0-14 years and 25-44 years in IRC LGA.

Cultural and ethnic diversity

The regional study area has less cultural and ethnic diversity than Queensland with 14.1 per cent of WRC residents and 9.9 per cent of IRC residents born overseas, compared to a state average of 20.5 per cent.

At the time of the 2011 census, 4.2 per cent of the WRC LGA population were identified as being of Aboriginal and/or Torres Strait Islander (Indigenous) origin or both, compared with 2.7 per cent in IRC LGA. The WRC LGA had a higher proportion of Indigenous population when compared to Queensland (3.6 per cent), while IRC LGA recorded a lower proportion than the state. Further details of the Indigenous population living in the regional study area are provided in Volume 2 Appendix M Social baseline.

Education and training

There are a wide range of educational institutions in the regional study area from preparatory level through to tertiary education. In 2013, there were almost 140 schools registered in the MIW region. Universities are located in major urban centres of Mackay and Townsville, and there are numerous TAFE campuses serving the MIW region.

In 2011, a total of 13,659 persons in the WRC LGA were recorded as aged 15 years and over with a qualification, or 53.5 per cent of the population in this age group. This was consistent with the 54.9 per cent recorded for IRC LGA and 54.2 per cent proportion recorded for Queensland.

Certificate level qualifications account for the majority of the total qualifications for the WRC and IRC LGAs. This could suggest that certificate level qualifications are more suitable for the employment opportunities available. This educational profile also correlates with the employment related data which illustrates that the main industries for employment in both regions are mining, accommodation and food services, retail trade, construction, and agriculture, forestry and fishing. The main occupations are machinery operators and drivers, technicians and trades workers and labourers.

Industry and employment

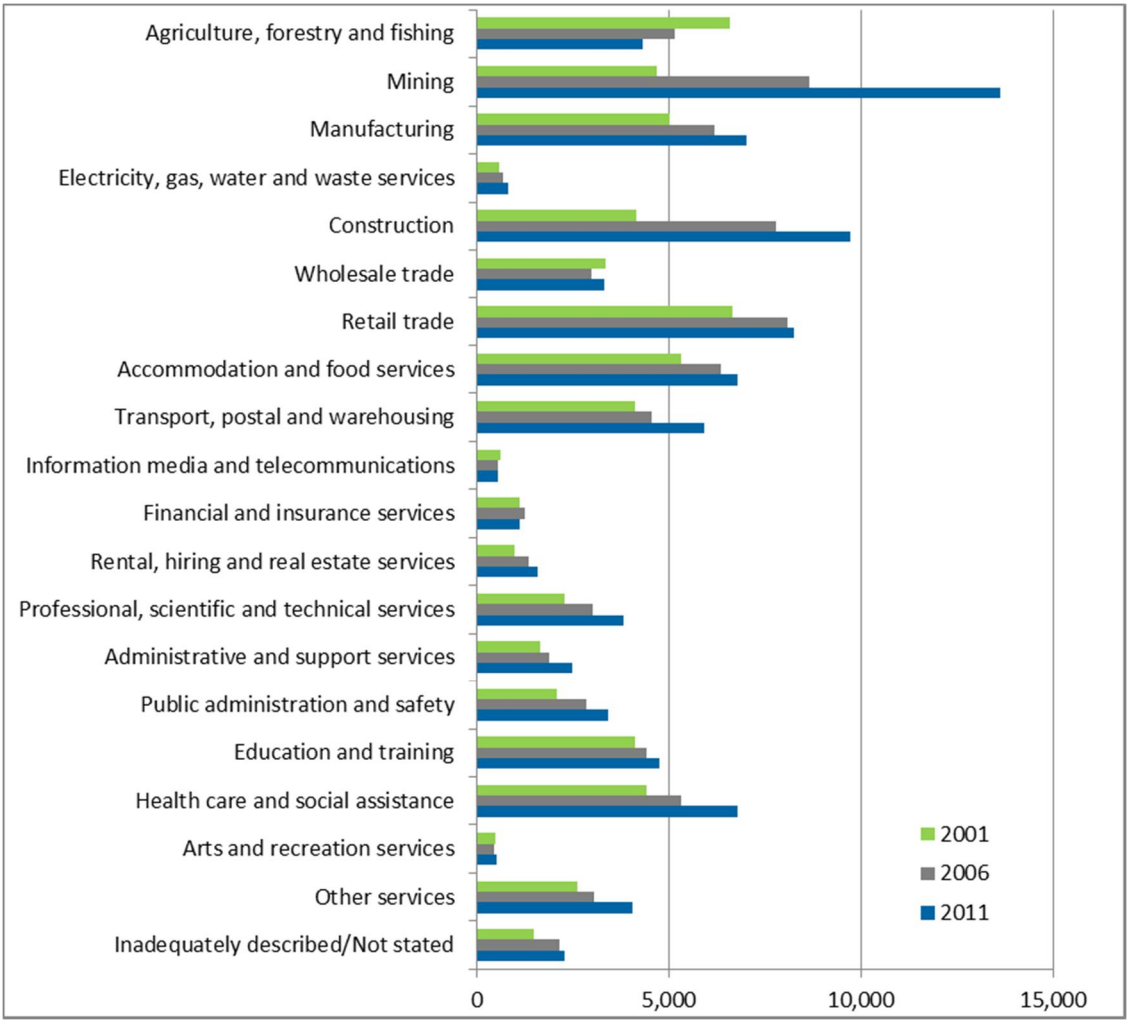
In 2011, there was an estimated 91,153 persons working in the MIW region. This is up from 76,758 in 2006. Between 2006 and 2011, employment within the region grew by 14,401 workers (ABS 2012). These figures include workers who travel into the region for work.

The major industries of employment in the MIW region in 2011 were mining (14.94 per cent), construction (10.67 per cent), retail trade (9.06 per cent), manufacturing (7.69 per cent), accommodation and food services (7.46 per cent) and health care and social assistance (7.46 per cent) (Figure 16-5) (OESR, 2013e and f). For comparative purposes, the unemployment rate in the MIW region was 4.3 per cent in 2012 (refer Figure 16-8).

Employment has increased in most industries in the MIW region between 2006 and 2011, in line with population growth. Only the agriculture, forestry and fishing and the financial and insurance services sectors have experienced a decline in the number of people employed in the MIW region during this period (refer Figure 16-5).

The proportion of the workforce employed in the mining sector increased by 57 per cent (4,958 persons) in the period between 2006 and 2011 and increased by 190 per cent (8,928 persons) during the ten years to 2011. The proportion of the workforce employed in the agriculture, forestry and fishing industry decreased by 16 per cent (834 persons) between 2006 and 2011 (OESR, 2013c).

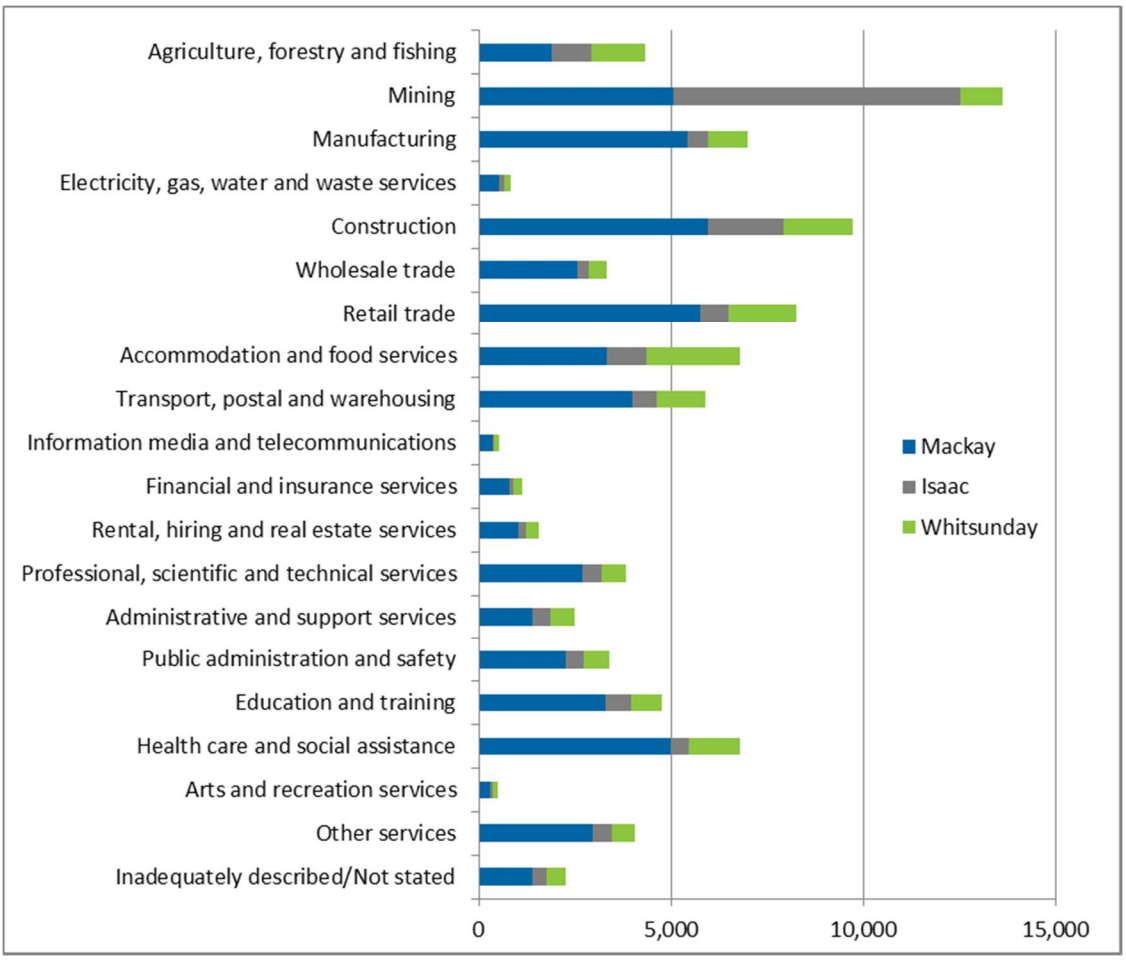
Figure 16-5 Employment by industry MIW region – 2001, 2006 and 2011



Source: OESR, 2013d

The 2011 employment composition (refer Figure 16-6) indicates that 61 per cent of people employed in the MIW region reside in the Mackay LGA. This is consistent with the population distribution between the Mackay, Isaac and Whitsunday LGAs where 67.6 per cent of the total population reside in the Mackay region. The majority of people employed within the mining sector (55 per cent) reside in the Isaac LGA.

Figure 16-6 Employment by industry MRC, IRC and WRC LGAs 2011



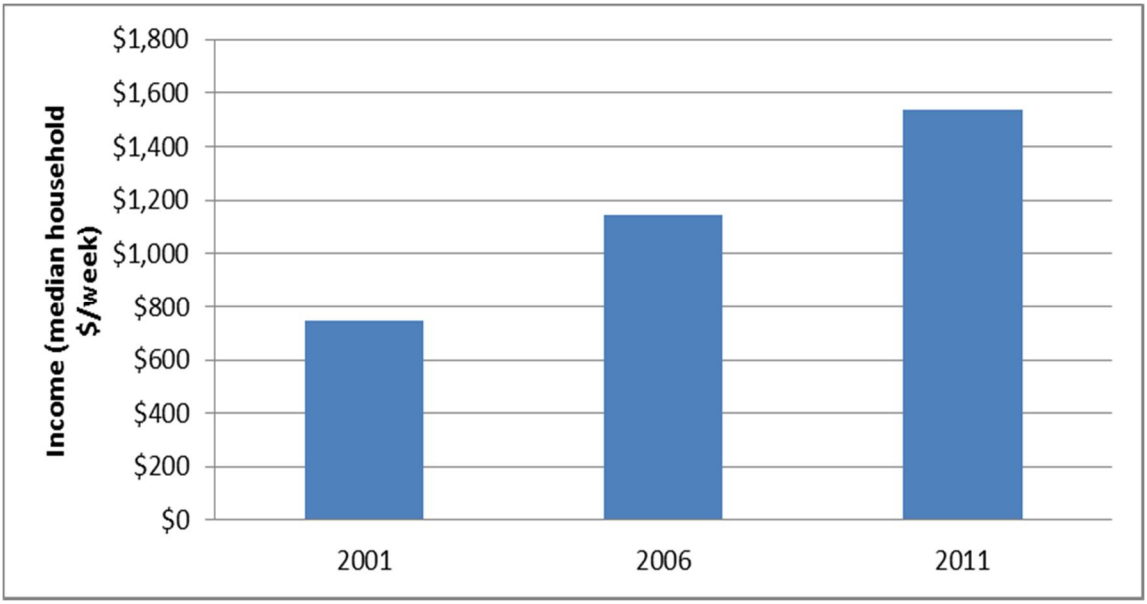
Source: OESR, 2013d

Income

Median weekly household income in the MIW region increased between 2001 and 2006 and again between 2006 and 2011 (refer Figure 16-7). Overall, median household income in the MIW region has increased by 107 per cent over this period. Wage increases of this magnitude are broadly consistent with a booming or lead sector such as the mining sector

In 2011, the WRC LGA recorded the highest proportion of the population in the lower income brackets and reflected a similar pattern to the Queensland data. Data shows that in WRC LGA 28.8 per cent were recorded in the $400 or less bracket and 34.9 per cent were recorded in the $400-$999 income bracket compared with 34.6 per cent and 31.7 per cent respectively for the Queensland totals. In contrast, IRC LGA had a relatively equal percentage for each income bracket with the largest percentage (23.1 per cent) recorded in the $2,000 or more weekly income bracket which could be attributed to mining in the region. The median weekly household income for WRC LGA is $1,165.

Figure 16-7 Median weekly household income – 2001 – 2011 – MIW region



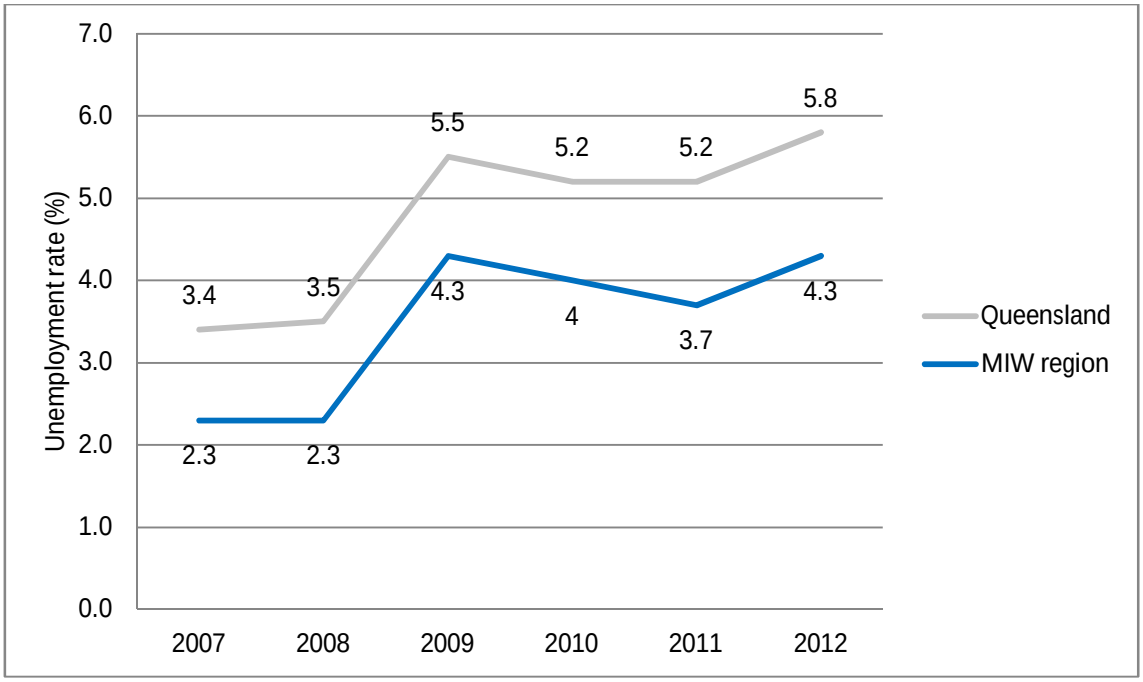
Source: ABS, 2013

Unemployment

The unemployment rate in the regional study area has historically followed a similar trend as the unemployment rate across Queensland. Figure 16-8 shows the unemployment rate in the MIW region is around 1.1 to 1.5 per cent lower than unemployment rate in Queensland.

Although unemployment is generally lower for the MIW region than the State average, there is considerable variation between the LGAs in the regional study area with an unemployment rate of 1.2 per cent recorded for IRC LGA and 6.5 per cent in the WRC LGA.

Figure 16-8 Unemployment rate - MIW region and Queensland 2007 – 2012



Source: OESR, 2013c

Economic output

The MIW region is the largest regional economy in Queensland. The region has the third largest GRP in Queensland behind Brisbane and the Gold Coast. Table 16-9 presents industry contributions to GRP across each of the three LGAs that make up the MIW region.

Table 16-9 GRP – MIW region 2011/12*

Sector	MRC LGA	IRC LGA	Whitsunday LGA	GRP	
	$m	$m	$m	$m	%
Agriculture, forestry and fishing	163	134	97	394	1.9
Mining	1,028	565	9,107	10,700	51.9
Manufacturing	600	111	59	770	3.7
Electricity, gas, water and waste services	89	28	22	139	0.7
Construction	480	155	212	847	4.1
Wholesale trade	552	84	62	698	3.4
Retail trade	338	108	44	490	2.4
Accommodation and food services	137	113	51	301	1.5
Transport, postal and warehousing	439	158	69	666	3.2
Information media and telecommunications	66	18	7	91	0.4
Financial and insurance services	222	56	25	303	1.5
Rental, hiring and real estate services	139	44	27	210	1.0
Professional, scientific and technical services	296	60	37	393	1.9
Administrative and support services	86	43	39	168	0.8
Public administration and safety	220	58	45	323	1.6
Education and training	224	58	45	327	1.6
Health care and social assistance	324	78	31	433	2.1
Arts and recreation services	11	6	2	19	0.1
Other services	155	30	29	214	1.0
Non classifiable industry	55	23	17	95	0.5

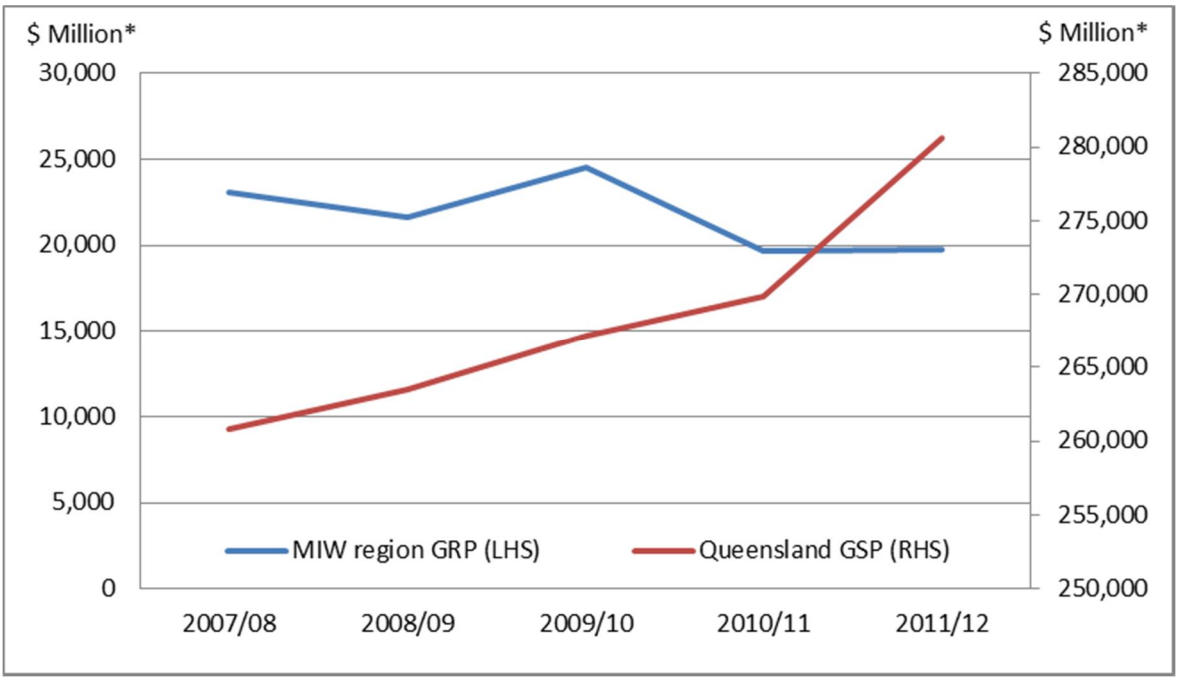
Sector	MRC LGA	IRC LGA	Whitsunday LGA	GRP	
	$m	$m	$m	$m	%
Total Industry Value Added	5,623	1,930	10,026	17,579	
Ownership of dwellings	566	194	1,009	1,769	
Taxes less subsidies on production and imports	413	142	737	1,292	
Statistical discrepancy	-4.9	-1.7	-8.7	-15.2	
GRP	6,597	6,597	11,763	20,624	
GSP, Queensland				283,604	

Note: * Current prices, denominated in 30 June 2012 dollars
Source: REDC (2012) Regional Report Card 2006-2011

Mining activities account for 52 per cent of the MIW regions' overall economic production. GRP for the MIW region was estimated to be approximately $20.6 billion (in 2012/13 dollar terms). GRP in the MIW region declined by 14.3 per cent in real terms between 2007/08 and 2011/12 (Table 16-9). This represents a decline of approximately 3.8 per cent per annum since 2007/08 despite an 18.8 per cent increase in the number of people employed in the region during this time. The decline in GRP growth in both 2008/09 and 2010/11 illustrates the effects of severe weather events hindering agricultural and mining production during these periods. Declining coal prices have also affected the contribution of the mining sector to the MIW region's GRP.

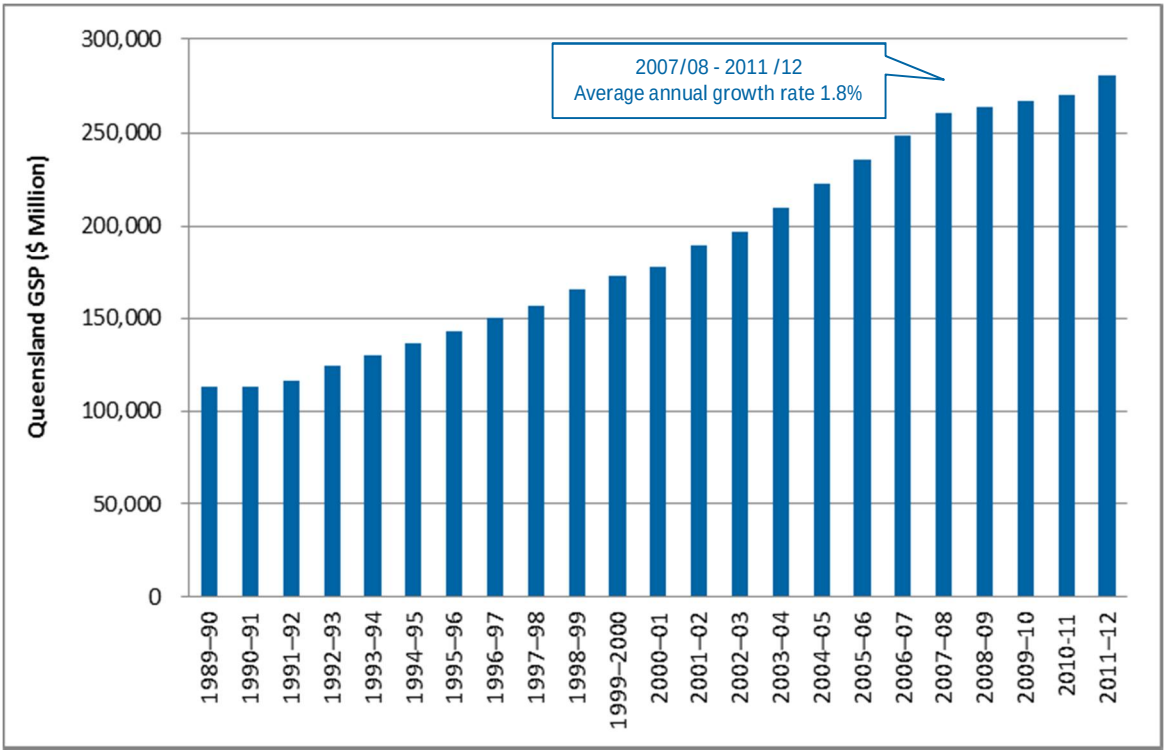
In contrast, over the same period, Queensland Gross State Product (GSP) grew at an average of 1.8 per cent per annum (Figure 16-9 and Figure 16-10), highlighting the extent of the downturn in the MIW regional economy during this period.

Figure 16-9 MIW Region GRP trend vs. Queensland GSP trend 2007/08 – 2011/12*



*Note: * Chain volume measures, denominated in 30 June 2011 dollars* Chain volume measures are used to estimate the value of economic growth over time by keeping the prices of goods produced and consumed constant—thereby removing the effect of inflation.
Source: REDC correspondence

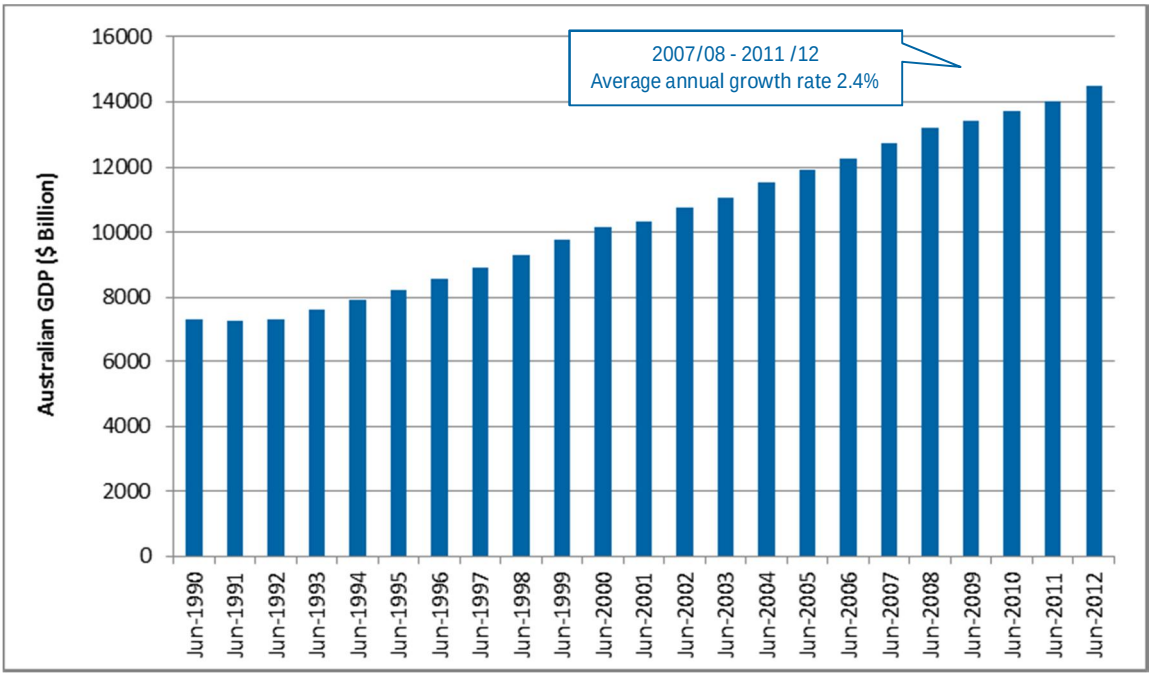
Figure 16-10 Queensland GSP 1989/90 – 2011/12*



Note: * Chain volume measures, denominated in 30 June 2011 dollars
Source: ABS (2012)

Australian Gross Domestic Product (GDP) over the preceding 20 years has steadily increased (Figure 16-11). Growth in GDP between 2007 and 2012 occurred at an average annual rate of 2.4 per cent—higher than Queensland GSP and GRP in the MIW region.

Figure 16-11 Australian GDP 1990-2012*

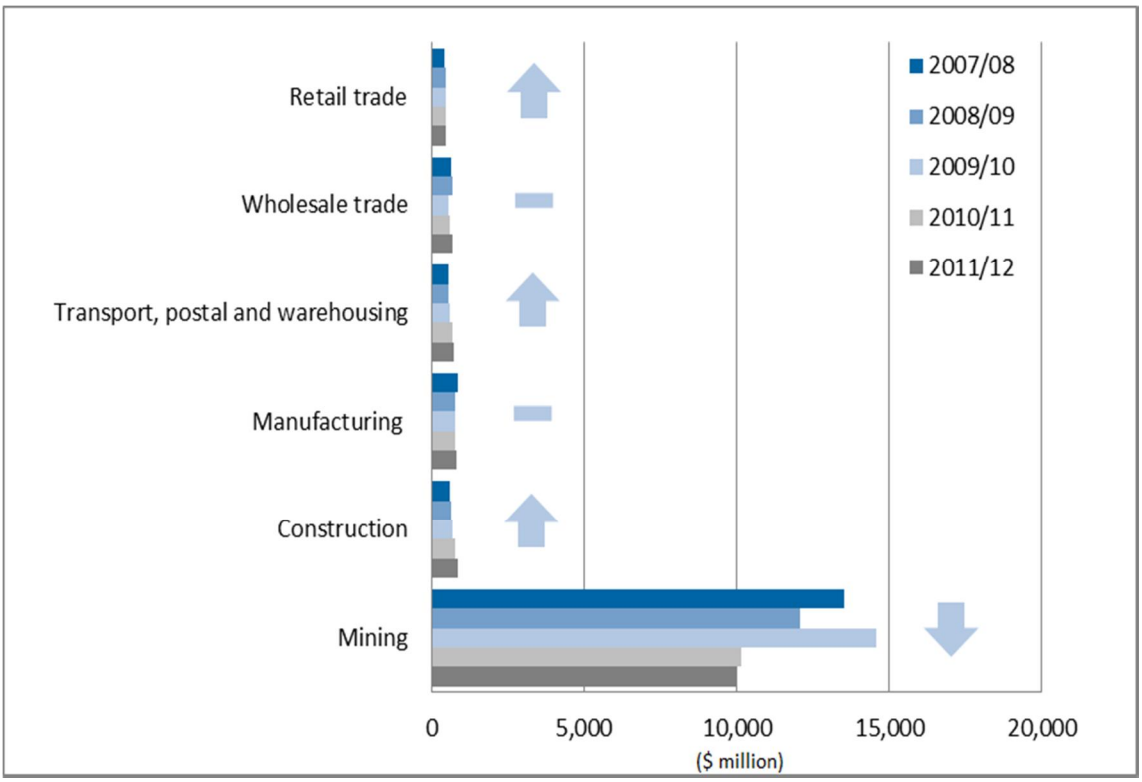


Note: * Chain volume measures, denominated in 30 June 2011 dollars
Source: ABS (2012)

Key industry profile

In 2011/12, the mining sector accounted for 52 per cent of the MIW region's GRP. Construction (4.4 per cent), manufacturing (4.1 per cent), transport, postal and warehousing (3.6 per cent), wholesale trade (3.4 per cent) and retail trade (2.4 per cent) are the other key contributing sectors to GRP (Figure 16-12).

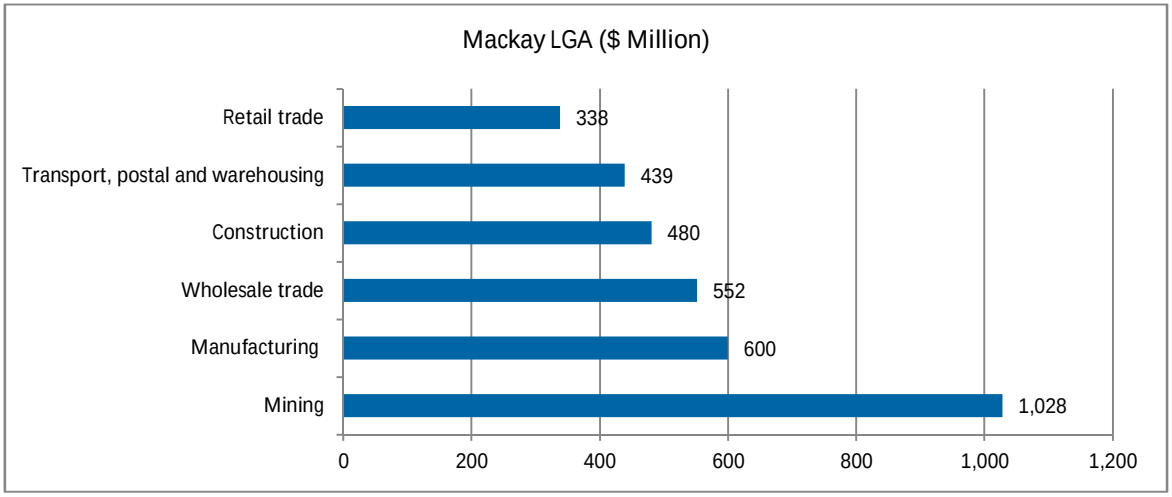
Figure 16-12 Industry contribution to GRP in the MIW region, 2007/08 – 2011/12*

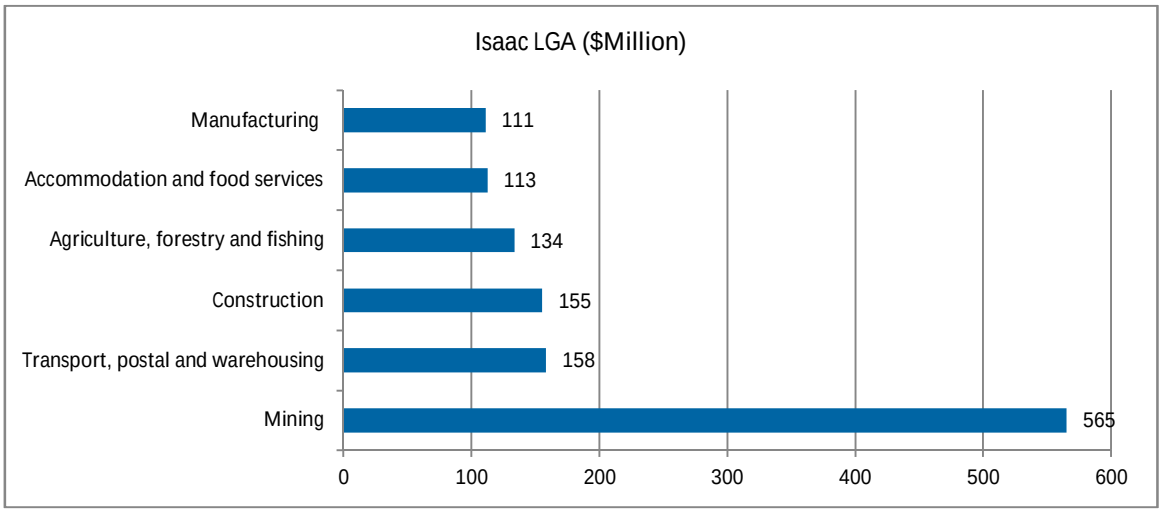


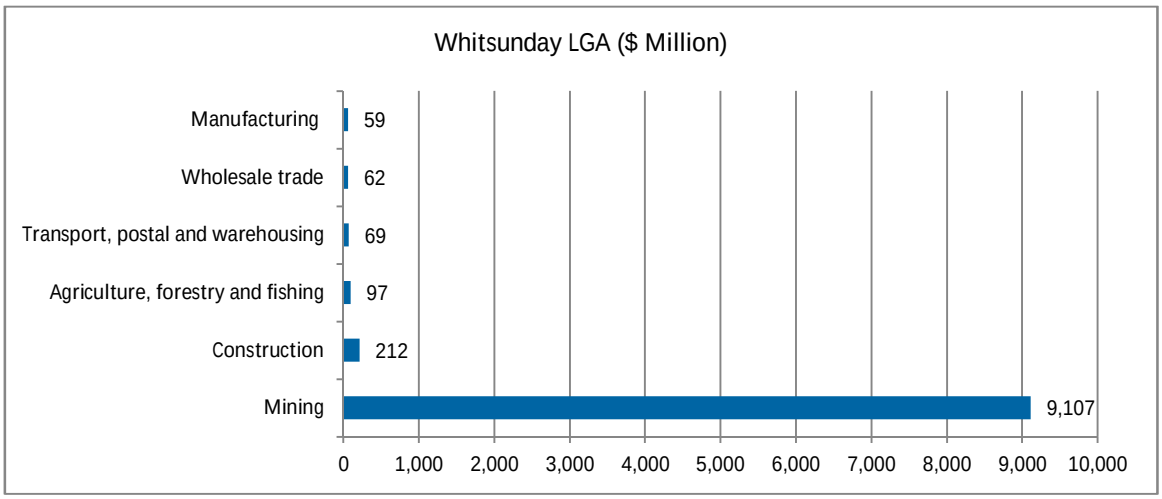
Note: * Chain volume measures, denominated in 30 June 2011 dollar
Source: MIW REDC correspondence

At the LGA level, there is some variation in terms of the contribution of each sector to GRP. As identified, the mining sector is the most significant contributor to GRP in the MIW region; especially in the WRC LGA where it accounts for 77 per cent of GRP. Agriculture is an important industry within the IRC and WRC LGAs as is accommodation and food services contributing 1.9 per cent and 1.5 per cent respectively to GRP. With Mackay city being the region's main urban centre, retail trade is an important contributor to GRP in the MRC LGA contributing to 2.4 per cent of GRP. Figure 16-13 identifies the six largest GRP contributors in the three LGAs in 2011/12.

Figure 16-13 Largest six GRP contributors, MRC, IRC and WRC LGAs, 2011/12*







Note: * Current prices, denominated in 30 June 2012 dollar
Source: REDC (2012) Regional Report Card 2006-2011

Economic viability

As outlined above, the MIW region is the largest regional economy in Queensland and had the third largest GRP in Queensland behind Brisbane and the Gold Coast. In 2011/12, the MIW region contributed 7.3 per cent to Queensland's GSP.

The Bowen Basin coalfields which are situated in the hinterland area to the West of Mackay City are a key natural resource for the MIW region. In 2011/12, the contribution of the mining sector to GRP in the MIW region was just over 50 per cent. The mining sector has been the largest contributor to the economy of the MIW region since 2007/08—the period for which GRP data is available.

However, the contribution of the mining sector to GRP in the MIW region has declined by 26 per cent since 2007/08 as shown in Table 16-10. Declining coal prices, unfavourable weather conditions and the high Australian Dollar have contributed to this trend. This decline in the mining sector has contributed to the average annual decline in GRP across the MIW region of 3.8 per cent shown in Figure 16-9.

Table 16-10 Contribution of the mining sector to GRP in the MIW region – 2007/08 – 2011/12 ($m)

Sector	2007/08	2008/09	2009/10	2010/11	2011/12
Mining	13,529	12,088	14,593	10,161	9,962

Source: REDC (2012) Regional Report Card 2006-2011

Housing and accommodation

The accommodation needs of people in the regional study area and those that may be attracted to the region to work within the major projects are expected to vary depending on a range of factors. Factors such as employment type, desired tenure of dwellings, household and family structure, income and accommodation preferences will all impact on the accommodation needs of the existing and future population (SGS Economics and Planning, 2010).

In 2011, the regional study area had a higher proportion of rented houses (36.5 per cent for WRC LGA and 60.8 per cent for IRC LGA) when compared to the State (33.2 per cent) (OESR 2013e and OESR 2013f). This may be an indicator of a higher proportion of transient population in the regional study area (particularly IRC), associated with the higher proportion of temporary or non-resident workforce in the region resulting in people choosing to rent rather than buying a house (refer Volume 2 Appendix M Social baseline).

Under the *Land Valuation Act 2010*, the Queensland Valuer-General has a general duty to make an annual valuation of all land within a LGA. The Queensland Valuer-General's annual land valuation findings for the MRC, IRC and WRC LGAs were released in March 2013. The valuation report found that the property market in Central Queensland (Central including Rockhampton, Gladstone, Banana, Mackay, Whitsunday, Isaac and Central Highlands Regional Councils) is stable with values showing only minor changes or remaining static. The resources sector continues to have a major influence on property values in the region. However, recent declines in thermal coal prices have resulted in weaker mining activity with some mine closures, industry rationalisation and reduced expansion. While there has not yet been evidence of sales softening in the vacant residential land market, major softening in the residential rental market has already occurred (Queensland Department of Natural Resources and Mines 2013).

Historically regional communities have been concerned that direct effects from projects with large workforce and/or cumulative effects from a number of projects have exacerbated shortages in housing supply and decreased housing affordability, leading to higher living costs for everyone, and particularly those not employed in the resources sector. From a review of other social impact assessment's as listed in Section 16.2.2 and NGBR Project consultation (June, 2013) it was found that in the years leading up to 2012, the regional study area particularly the communities of Moranbah and Collinsville have experienced issues related to housing availability (refer Volume 2 Appendix M Social baseline).

However, the recent down turn in mining activities and a halt on Port of Abbot Point developments has resulted in a reduction in the non-resident workers and a number of people leaving the area in search of employment opportunities elsewhere. This has increased housing availability both of rental and purchase in Bowen, Collinsville and Moranbah. Recent media articles suggest that the downturn in the mining industry can most easily be seen in the fast-falling rents. Rental prices have plummeted with the onset of the downturn in coal mining in the WRC and IRC LGAs, with the Residential Tenancies Authority's comparison of rental prices in the Bowen Basin revealing a drop in every town from March 2012 to March 2013 (Daily Mercury 2013). Searches conducted from realestate.com (2013) on 1 August 2013 show that there are over 1,000 properties available for sale and over 100 properties available for rent in Bowen; over 200 properties available for sale and over 100 properties available for rent in Collinsville; and over 300 properties in total available for both sale and rent in Moranbah.

Also NGBR Project consultation (June 2013) with WRC, Whitsunday Marketing and Development Ltd and Mining Communities United revealed that there are currently a number of vacant rental properties available in Bowen and Collinsville due to the downturn in the mining industry which has resulted in staff cuts and/or mine closures and people having moved away to find work elsewhere. Consultation also revealed that the housing stock in Bowen in particular was old and that the house prices and rental costs were currently more affordable than previous times; however this view was contradicted by some stakeholders who felt prices were still excessively high.

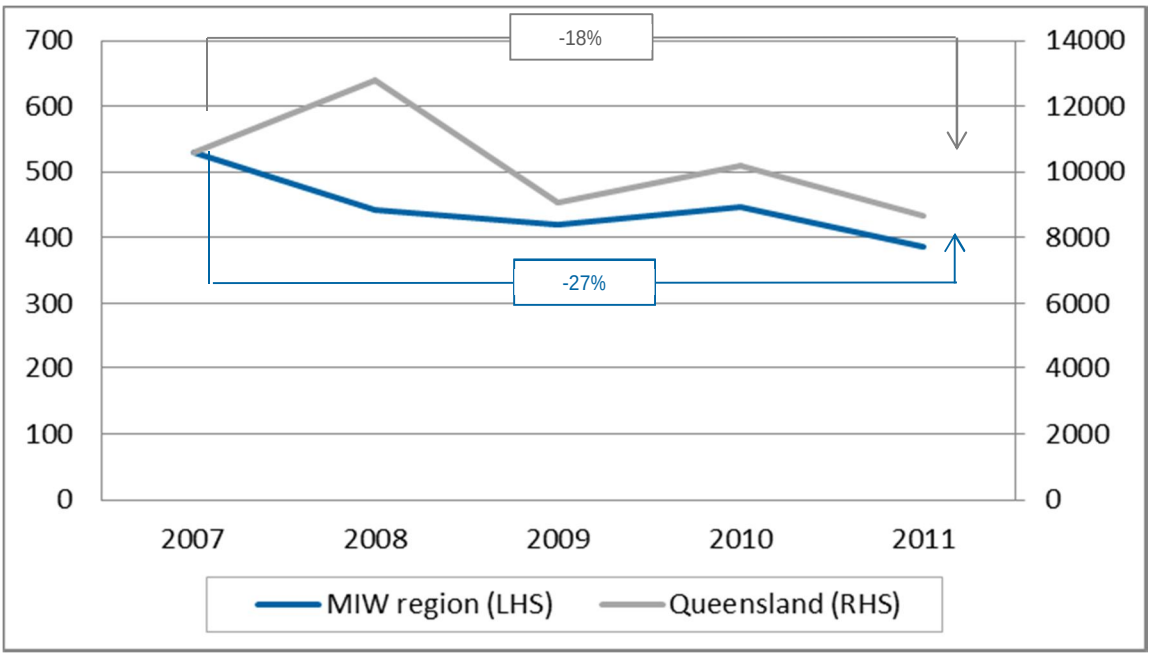
Additionally, housing growth opportunities also exist for Bowen, Collinsville and Moranbah, which include intensification of development in parts of Bowen may be accommodated, increasing residential density and housing choice and land to the east of Collinsville (west of Pelican Creek) to be further investigated to determine capacity to accommodate residential development (Queensland Government 2012). NGBR Project consultation (June 2013) with WRC further confirmed the availability of land for both housing and industrial development in Collinsville, and opportunities for further housing development in Bowen.

In the 12 months ending 30 June 2013, there were 2,666 dwelling units in new residential buildings approved in MIW region, with a total value of $761.4 million.

Non-residential development

The value of total non-residential building approvals in the MIW region declined by $40.9 million or 17 per cent between 2007 and 2011 (ABS, 2013). Much of this weakness is due to a significant decline in non-residential building approvals in the coastal region of the WRC LGA (Proserpine, Cape Conway and Airlie - Whitsundays) since 2006/07. In the rest of the MIW region, growth in the value of total non-residential building approvals has been quite steady with the exception of a large increase in 2009/10 for MRC LGA, as shown in Figure 16-14.

Figure 16-14 Value of total non-residential building approvals – MIW region



LHS – left hand side axis
RHS – right hand side axis
Source: ABS, 2013

Social infrastructure

Social infrastructure is essential for community wellbeing and plays an important role in bringing people together, developing social capital, maintaining and improving quality of life, and developing the skills and resilience essential to strong communities.

There is a range of social infrastructure provided in the WRC and IRC LGAs. Major facilities and services identified from Council plans, reports and websites are presented in Table 16-11 for WRC and IRC LGAs.

Table 16-11 Social Infrastructure in WRC LGA

Social infrastructure	WRC LGA	IRC LGA
Education facilities	• 23 early childhood education and care services comprising 2 family day care, 5 kindergartens, 9 long day care, 6 school aged care, 1 limited hours care (OESR 2011d) • 17 schools in the WRC area (OESR 2011d) • Barrier Reef Institute of TAFE campuses in Bowen and Cannonvale.	• 19 schools (OESR 2011e) • 10 early childhood education and care services (6 long day care services, 3 kindergarten services, 1 limited hours care service) (OESR 2011e) • CQ TAFE- Moranbah (Queensland Government 2012) • Coalfields Excellence Training Centre- Moranbah (Queensland Government 2012)

Social infrastructure	WRC LGA	IRC LGA
Community, cultural and recreational facilities	• Whitsunday Regional Libraries 4 branches- Cannonvale, Bowen, Collinsville, Proserpine • Well established sport, recreation and park facilities in key population centres (includes parks, Whitsunday Botanic Gardens, beaches, lagoons, skate parks, playgrounds, outdoor gym equipment, several boat ramps, several walking tracks, Whitsunday PCYC, Bowen PCYC, Proserpine Entertainment Centre, Proserpine Youth Space, museum) • Proserpine- regional-level social and recreational services catering for Cannonvale and Airlie Beach. Services include a hospital, aged care, expanding education facilities, a large cultural centre and recreation facilities, e.g. motor sport track, equestrian facilities, a swimming pool and sports ovals. • Swimming pools (Bowen, Proserpine, Collinsville, Cannonvale State School) and Bowen Water Park Playground • Community halls and centres in most towns • Great Barrier Reef Marine Park and 74 Islands, various national parks and state forests.	• Libraries (Carmila, Clermont, Dysart, Glenden, Middlemount, Moranbah, Nebo, St Lawrence) • Well established sport, recreation and park facilities in key population centres (e.g. parks, skate parks, sportsgrounds, recreation centres, court facilities, BMX track, exercise equipment) • Swimming pools and aquatic facilities (Clermont swimming pool, Dysart swimming pool, Flaggy Rock pool, Glenden swimming pool, Middlemount swimming pool, Greg Cruickshank Aquatic Centre, Nebo swimming pool, St Lawrence swimming pool) • Community halls and centres in most towns
Health and wellbeing facilities	• 3 hospitals in the WRC area (OESR 2011d). Proserpine has the main public hospital in the subregion and provides a range of medical and allied health services to Airlie Beach, Cannonvale, and surrounding rural areas. Bowen's hospital is predominately focused on allied health services. • Collinsville hospital and multipurpose health facility caters for aged care and primary health	• 3 hospitals (Clermont, Moranbah, Dysart) (OESR 2011e) • 3 aged care services with a total of 71 operational places (28 community care, 43 residential aged care) (OESR 2011e)

Social infrastructure	WRC LGA	IRC LGA
	care needs, regional health services and private practice clinics • 12 aged care service providers total of 260 places (57 community care, 203 residential care) (OESR 2011d).	
Other major facilities and services	• Government agencies • Local, district and town centre shopping • Emergency services – 5 ambulance stations, 4 police stations and 4 fire stations in the Whitsunday area (OESR 2011d) • Aviation facilities- Whitsunday Coast Airport, Bowen Aerodrome, Collinsville Aerodrome, Hamilton Island Airport, and two smaller airports for light aircraft one at Shute Harbour the other on Lindeman Island. • Port facilities- Shute Harbour Transit Facility, Port of Abbot Point, Port of Airlie • Public transport services • Marinas- ferry services • Harbours.	• Government agencies • Local, district and town centre shopping • Emergency services - 8 police stations, 15 ambulance stations and 5 fire stations (OESR 2011e) • Aviation facilities – Clermont Aerodrome • Public transport services

Source: WRC 2013a, IRC 2013a

Community health and safety

The higher prevalence of poor health and health risk factors was aligned with older age profile of the WRC LGA. The regional study area had a lower proportion of people in need of assistance with a disability (3.6 per cent) when compared to Queensland (4.4 per cent).

The Socio-Economic Indexes for Areas (SEIFA) is a summary measure of the social and economic conditions of geographic areas across Australia (OESR, 2013e). SEIFA comprises a number of indexes, which are generated at the time of the ABS Census.

In the regional study area, a high proportion of population the IRC LGA was in quintile 5 (least disadvantaged). The higher income rates in this LGA likely attributed to the population being identified as less disadvantaged than Queensland averages. The WRC LGA registered the highest proportion of persons in quintile 1 (most disadvantaged) compared to both IRC LGA and Queensland. This could be attributed to the WRC region's lower income rates and higher unemployment rate.

The WRC LGA recorded the highest incidence of crime in the regional study area. The most common crimes in the regional study area were for lesser offences such as Unlawful Entry, Other Theft (excluding Unlawful Entry), drug offences, Good Order Offences and Traffic and Related Offences, while the serious offences, such as homicide, recorded very low numbers.

The crime data does not describe any characteristics of the offender and therefore no co-relation between the offenders and the non-resident population or workers engaged in resource industry activities can be made. However, consultations with QPS staff in Bowen, Collinsville and Moranbah (NGBR Project consultation June 2013, refer Volume 2, Appendix B Public consultation) confirmed that workers camps or the non-resident workers living in workers camps in the region are not a concern from a crime and community safety point of view, and QPS if at all rarely needs to attend to issues with camps or non-resident workers. The acknowledged that in recent time the camps are operated in such a way that the workers have minimum interaction with communities and any offence by the workers is met with serious consequences by their employers.

16.4 Workforce profile

This section presents details on the workforce to be engaged for the NGBR Project. The information contained in this section forms the basis for assessment of potential impacts described in Section 16.5.

It should be noted that the NGBR Project is in its conceptual design stage, and while it is possible to predict the skills required in the construction and operation workforces, workforce requirements for both construction and operation are indicative only.

Whilst the NGBR Project has an expected life span of 90 years, the workforce profile for the NGBR Project is focused on a 10 year timeframe to account for any potential changes in the operation of the NGBR Project in the future.

Changes in workforce requirements are not likely to affect the overall conclusions of this social impact assessment, but the magnitude of some impacts and benefits may change with increases or decreases in workforce numbers.

16.4.1 Construction workforce

Construction workforce requirements

Estimations for the construction workforce numbers are based on a benchmarking exercise undertaken by Aarvee Associates (2013) with previous similar projects to identify the likely level of construction workforce required for the NGBR Project.

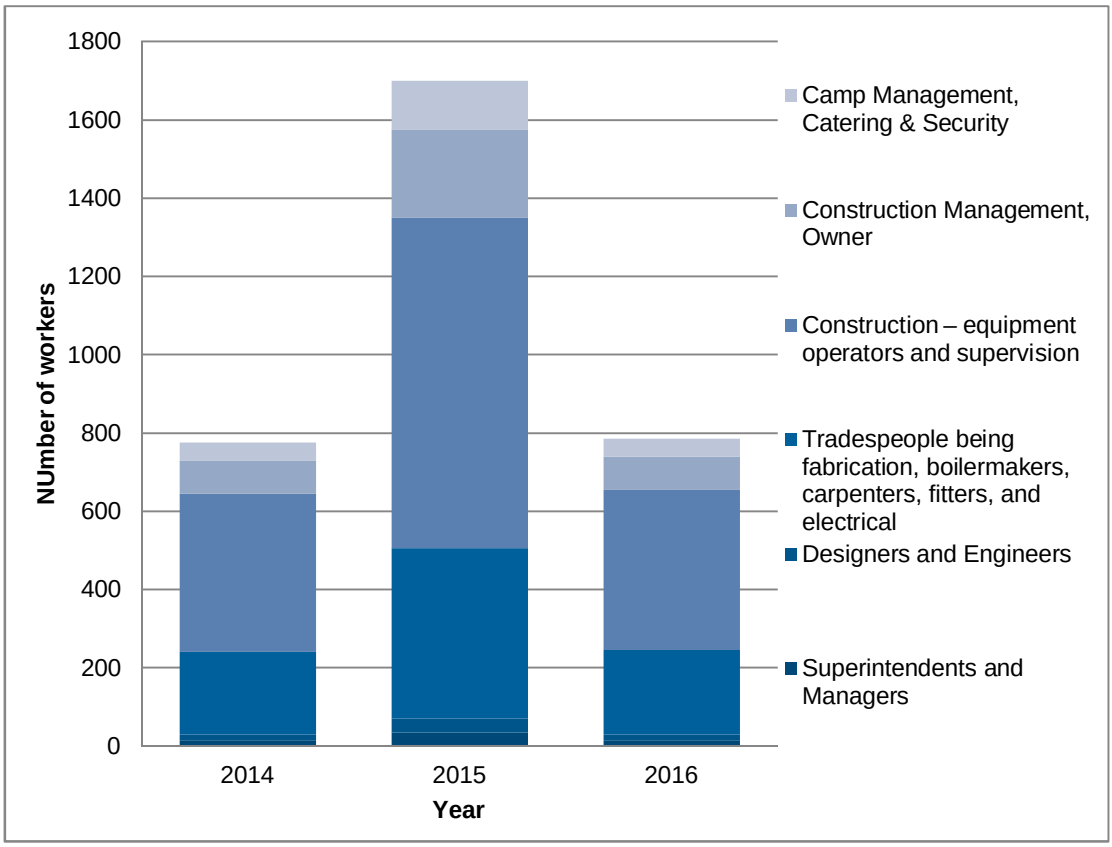
Construction will commence in late 2014 with 775 workers, before ramping up to reach a peak workforce of 1,700 workers in 2015 and concluding in 2016.

During construction a variety of skills will be required including labourers, tradespeople, machinery operators, engineers, surveyors and site supervisors. The overall number of construction workers and range of skills required for the construction of the NGBR Project are shown in Figure 16-15. Detailed breakdown of the construction workforce is provided in Table 16-12.

Table 16-12 Construction workforce profile

Construction workforce profile - by year			
	2014	2015	2016
Total construction workforce	775	1700	785
Superintendents and managers	15	35	15
Designers and engineers	15	35	15
Tradespeople being fabrication, boilermakers, carpenters, fitters, and electrical	210	435	215
Construction – equipment operators and supervision	405	845	410
Construction Management, Owner	85	225	85
Camp Management, Catering & Security	45	125	45
Total FTE	**775**	**1700**	**785**

Figure 16-15 Construction workforce - skills requirements



Source and travel arrangements of construction workforce

Five temporary construction camps will be developed to house construction workers for the NGBR Project. The camps will be located in order to minimise non-productive workforce travel time and to be located in close proximity to logistics routes and the major work elements identified. Indicative locations for the temporary construction camps are shown in Table 16-13 and Figure 16-16.

During the construction phase, recruitment and management of the workforce will largely be the responsibility of contractors and subcontractors appointed to construct the railway line and associated facilities. As these contractors are not yet appointed, it is not possible to provide accurate details on where workforce may be sourced.

Approximately 80 per cent (1,360 persons at peak) of the construction workforce is expected to FIFO from within Australia, to regional airports such as Proserpine Moranbah and Mackay. Based on similar projects in Queensland, it is expected that workers would be collected from one or more population centres on the east coast of Queensland. From these regional airports, the workforce will be transferred to any of the five construction camps by bus. It is expected that the remaining 20 per cent (approximately 340 persons at peak) of the workforce will be sourced from regional townships in the vicinity of the NGBR Project. Workforce who are local to these regional townships may DIDO or be transported as a group by bus, to minimise transport risk. The local workforce will make daily trips from regional townships to one of the five temporary construction camp sites.

Recruitment of workers from overseas is not expected as most skills required to construct the railway line are available within Australia. A small number of technical specialists may be required for short term assignments.

Due to large travel distances, particularly in the central to southern sections of the final rail corridor, the local workforce may be required to reside in the temporary construction camps when on roster; fatigue management requirements will most likely prevent long drives at either end of a shift.

Table 16-13 Location and capacity of temporary construction camps

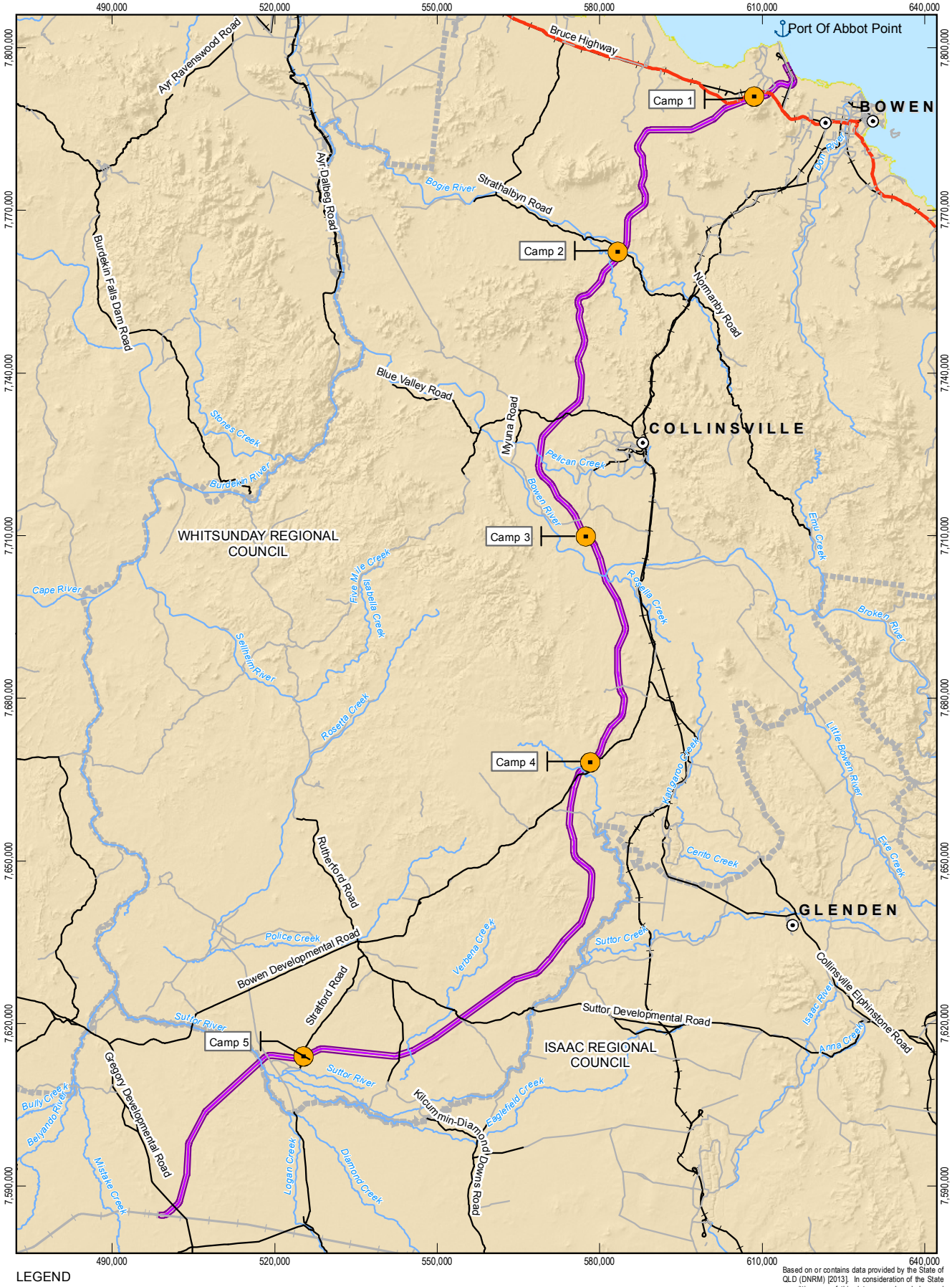
Facility	Approximate chainage (km)	Size (no. of beds)	Notes
Construction Camp 1 (North)	15	300	Access from the Bruce Highway.
Construction Camp 2 (North)	62	400	Possible temporary access by upgrading the Occupational crossing at chainage 67.315 km from the Bowen Developmental Road to the NGBR Project final rail corridor.
Construction Camp 3 (Central)	124	300	Possible temporary access by constructing a new access road by the western side of the Xstrata Collinsville mine to the NGBR Project final rail corridor.
Construction Camp 4 (Central)	170	400	Access via the Bowen Developmental Road.
Construction Camp 5 (Central)	263	300	Access via Stratford Road.

The final location of these temporary construction camps is still being determined through the detailed design phase, which will take into account negotiations with landowners and other key stakeholder such as WRC, IRC and accommodation providers. Considerations include:

- Existing infrastructure, particularly road access
- Serviceability and proximity to logistics routes
- Construction activities to be undertaken from the camp location and travel distances to more labour intensive aspects such as bridge construction.

Camps will also require the following services:

- Potable water and water treatment
- Sewage and wastewater collection and treatment/disposal facilities
- Electricity
- Communications
- Laundry facilities
- Solid waste management.



LEGEND

- Population Centres
- Major Port
- Construction Camp
- Highway
- Main Road
- Local Road
- Carmichael Project (Rail)
- Railway
- Watercourse (Major)
- North Galilee Basin Rail 1000m Corridor
- North Galilee Basin Rail 100m Corridor

1:1,000,000 Paper Size A4

0 7.5 15 30

Kilometres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

N

Adani Mining Pty Ltd

North Galilee Basin Rail Project

Location of temporary construction camps

Job Number	41-26457
Revision	B
Date	27 Sep 2013

Figure 16-16

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145 Ann Street Brisbane QLD 4000 Australia T 61 7 3316 3000 F 61 7 3316 3333 E bnemail@ghd.com W www.ghd.com

Data source: GA: Populated Places, Railway, Watercourse/2007; Adani: NGBR Corridor 13/05/2013, NGBR Corridor 06/06/2013, Carmichael Project (Rail) 18/06/2013, Camps; DNRM: Roads/2010. Created by:MS

Construction workforce rosters

It is proposed that working rosters for the construction phase of the NGBR Project will include the following:

- Earthworks and drainage – 14 days on, 7 days off (rolling)
- Structures – 10 days on, 4 days off
- Track works – 14 days on, 7 days off (rolling)

These are preliminary rostering scenarios, and may be subject to further refinement during the detailed design phase and through discussion/negotiation with construction contractors.

However, Adani intend to implement rosters that facilitate strong productivity and a lifestyle balance that will appeal to potential employees and their families (refer to workforce management strategy in Section 16.6.2).

Construction workforce training

As most workers involved in the construction phase will be employed by contractors and subcontractors, training of workers will be the responsibility of these employers. Generally, most contractors already have training programs in place to address potential industry shortfalls. For details on workforce training refer to Section 16.6.1.

16.4.2 Operation workforce

Operation workforce requirements

Construction of the rail line is expected to be complete in late 2016, with first coal and operation activities to commence subsequently. The operation workforce will comprise of personnel to operate the rail services and maintain the locomotives and rolling stock, rail lines and rail facilities.

Operations will commence with a workforce of 66 persons in 2016 and will gradually increase to 254 workers in 2021 to cater for the 60 million tonne per annum (mtpa) output from the proposed Carmichael Coal Mine and Rail Project. The ultimate capacity of the NGBR Project is expected to reach up to 100 mtpa in 2026. Therefore, it is anticipated that the operation workforce will increase concurrently with coal production, and gradually increase to a peak of 369 workers in 2026 (refer Figure 16-17 for skills requirements). A detailed breakdown of the operation workforce is provided in Table 16-14.

Source and travel arrangements of the operation workforce

The NGBR Project will source the majority of the operation workforce from within the regional study area. However, depending on the availability of skilled resources within the region, the operation workforce may need to be supplemented with workers from other parts of Australia who would be relocated to Bowen on a permanent basis and will be accommodated in the local housing market in Bowen.

Driver crews, consisting of a driver and co-driver will take empty trains from the Port of Abbot Point to the proposed Carmichael Mine where they will rest before returning to Abbot Point Coal Terminal with full trains.

The size of the operation workforce required at any time will vary depending on the number of trains in operation. It is expected that 10 train operators per train will be required. Up to 15 train operators per train may be necessary where trains are few in the early phase of operation. The estimates of the operation workforce and skills for the NGBR Project are shown in Figure 16-17.

Operation workforce rosters

Rosters will be structured to maintain a family/work/life balance and several options are currently being assessed.

Cycle times show that crews working the loaded trains would work a 12 hour shift, with change-overs occurring at the mine-end and port-end respectively. No personnel will be required to work more than 14 hours in any 24-hour period.

Operation workforce training

Adani is in the early stages of developing a workforce training and development policy and program for its Australian operation. There are predicted skill shortages in engineering and technical disciplines required for rail operation (GHD 2013). Adani is committed to the development, training and employment of apprentices/trainees on the NGBR Project. Adani will support skills development and the up-skilling of its workforce and is strongly encouraging its contractors to actively support apprentice/trainee development, training and employment through the placement of appropriate numbers of apprentices and trainees on the work site; subject to associated regulatory requirements and restrictions. Further information on Adani's proposed training and development programs is provided in Section 16.6.1.

Figure 16-17 Operation workforce – skills requirements

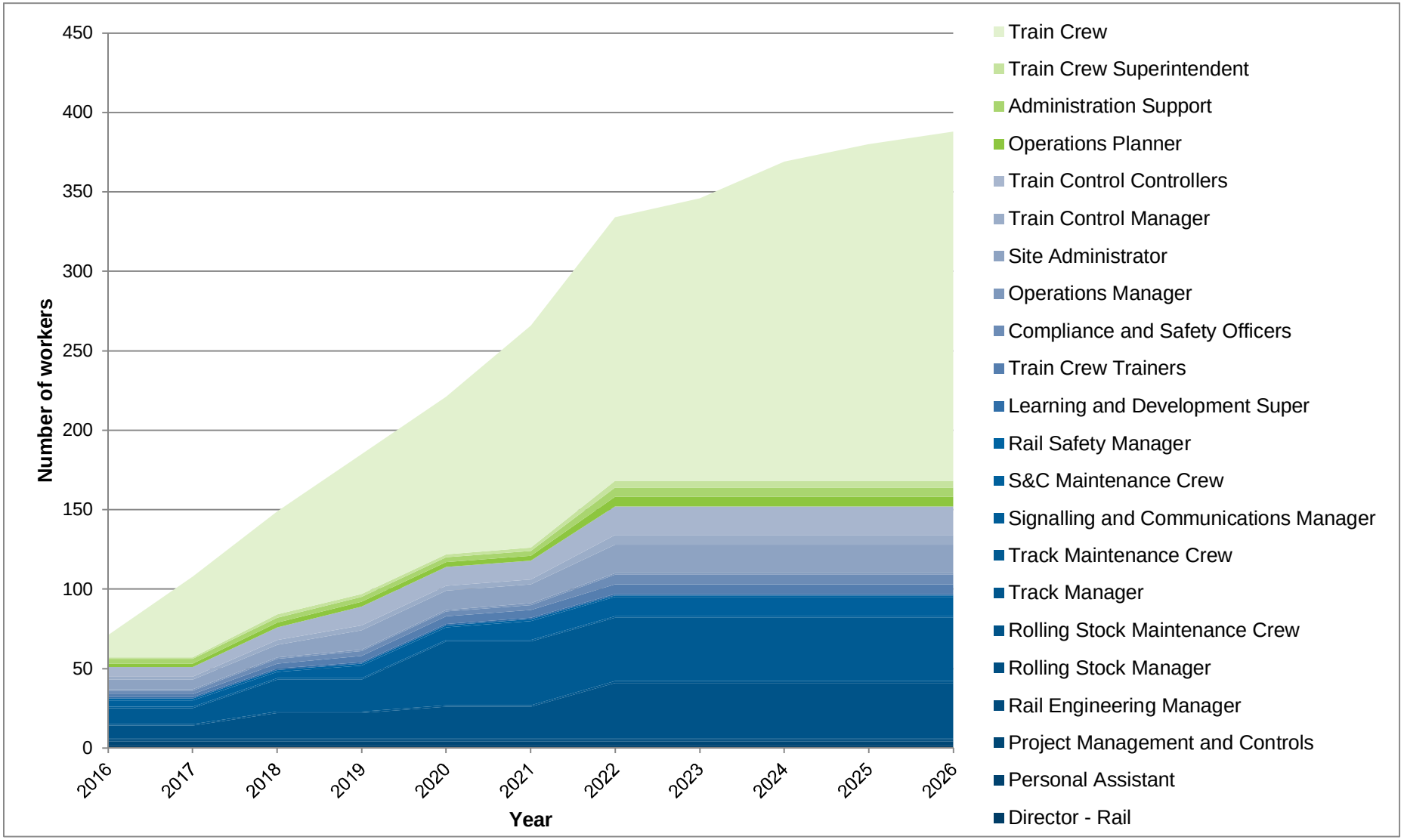

Table 16-14 Operation workforce profile

Operation workforce profile – by year	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Tonnage profile (mtpa)	4	20	30	40	50	60	70	80	90	95	100
Total operation workforce	66	103	141	173	209	254	315	327	350	361	369
Occupation	FTE	FTE	FTE	FTE	FTE	FTE	FTE	FTE	FTE	FTE	FTE
Director - Rail	1	1	1	1	1	1	1	1	1	1	1
Personal Assistant	1	1	1	1	1	1	1	1	1	1	1
Project Management and Controls	2	2	2	2	2	2	2	2	2	2	2
Rail Engineering Manager	1	1	1	1	1	1	1	1	1	1	1
Rolling Stock Manager	1	1	1	1	1	1	1	1	1	1	1
Rolling Stock Maintenance Crew	8	8	16	16	20	20	35	35	35	35	35
Track Manager	1	1	1	1	1	1	1	1	1	1	1
Track Maintenance Crew	10	10	20	20	40	40	40	40	40	40	40
Signalling and Communications Manager	1	1	1	1	1	1	1	1	1	1	1
S&C Maintenance Crew	4	4	4	8	8	12	12	12	12	12	12
Rail Safety Manager	1	1	1	1	1	1	1	1	1	1	1
Learning and Development Super	1	1	1	1	1	1	1	1	1	1	1
Train Crew Trainers	2	2	3	4	5	5	6	6	6	6	6
Compliance and Safety Officers	2	2	3	3	3	3	6	6	6	6	6
Operations Manager	1	1	1	1	1	1	1	1	1	1	1
Site Administrator	6	6	8	12	12	12	18	18	18	18	18
Train Control Manager	2	2	3	3	3	3	6	6	6	6	6
Train Control Controllers	6	6	8	12	12	12	18	18	18	18	18
Operations Planner	2	2	3	3	3	3	6	6	6	6	6
Administration Support	3	3	3	3	3	3	6	6	6	6	6
Train Crew Superintendent	1	1	2	2	2	2	4	4	4	4	4
Train Crew	14	51	65	88	99	140	166	178	201	212	220
Total FTE	**66**	**103**	**141**	**173**	**209**	**254**	**315**	**327**	**350**	**361**	**369**

16.5 Potential social and economic impacts

Social and economic impacts have been identified for NGBR Project construction and operation. Due to the proposed life of the NGBR Project (i.e. 90 years), it is expected that the associated social and economic impacts will vary over time, subject to changes in the social, economic and political context of the region. As a result adaptive management strategies will be applied for the life of the NGBR Project. Monitoring mechanisms have been proposed to assess the likely impacts of any changes throughout operation.

The relevant International Principles for Social Impact Assessment developed by the IAIA have been considered in the assessment of potential social impacts for the NBGR Project. This includes consideration of precautionary and uncertainty principles so that where the likelihood of occurrence of an impact was uncertain, the impact was still considered in the assessment.

The impact identification and assessment is based on the existing social, economic and cultural conditions at the time of the assessment and relies on information provided by stakeholders during consultations. Where possible, references are made to past trends and any notable deviations.

- The potential social and economic impacts associated with the NGBR Project in both the construction and operation phases relate to: Local and regional business development
- Workforce management
- Land management
- Housing and accommodation management
- Management of community health and wellbeing
- Ongoing stakeholder and community engagement.

16.5.1 Regional development, local and regional business and employment impacts

During the NGBR Project consultation undertaken in June 2013, stakeholders identified that the NGBR Project may result in significant economic and employment benefits. These can generally be classified into three key areas:

- Provision of goods and services to the NGBR Project from local and regional businesses
- New employment opportunities, apprenticeships and training resulting in long-term career pathways for residents of the local study area and to a lesser extent, the regional study area
- Indirect benefits in terms of multiplier-effects generating employment and business activity at a regional level from increased economic activity.

Regional business opportunities

It is estimated that at a regional level, the NGBR Project is expected to generate a significant and positive economic impact in the MIW region and in Queensland.

The NGBR Project will involve a capital investment of approximately $2.2 billion which includes capital expenditure on earthworks, drainage, bridges, road works, rail track and signalling, communications and construction management costs.

Requirements during both construction and operation may include civil and structural engineering works, equipment and vehicles, supply of food and other consumables to the temporary workers camps, laundry services, transportation services and services associated with environmental monitoring and rehabilitation.

On this basis, it was assumed that, over the life of the NGBR Project, 75 per cent of the capital investment for the construction of the NGBR Project will occur in the MIW region and 10 per cent elsewhere in Queensland. The remaining capital expenditure (15 per cent of the total) is assumed to occur outside Queensland (i.e. interstate and overseas). This is consistent with other rail projects including the assumption made for Adani's Carmichael Coal Mine and Rail Project's rail line to connect from the proposed Carmichael Coal Mine site to the existing Goonyella rail system.

Construction is due to commence in 2014 subject to approvals being obtained and is expected to be complete by December 2016. Direct construction expenditure is presented in Table 16-15.

Table 16-15 Direct expenditure – construction ($m)

Year	2014	2015	2016	Total
MIW region	335	921	418	1,674
Elsewhere in Queensland	45	123	56	223
Outside Queensland	67	184	84	335
Total	447	1,228	558	2,232

Operation of the NGBR Project is expected to commence in 2016 with activity expected to peak around 2026. Operation expenditure includes fuel, labour, track refurbishment, maintenance and costs to purchase locomotives and wagons. It was assumed that 70 per cent of operation expenditure will occur in the MIW region, 23 per cent outside the MIW region but still in Queensland and 7 per cent outside Queensland (i.e. interstate and overseas).Expenditure that was assumed to occur in the Mackay region includes a large proportion of labour, fuel and maintenance costs and approximately 50 per cent of track maintenance costs. A large proportion of overheads, finance and business administration costs as well as some track maintenance costs are assumed to occur outside the MIW region but still in Queensland. Some track maintenance finance/overhead costs are assumed to occur interstate and overseas. Direct expenditure through the operation phase of the NGBR Project is presented in Table 16-16. For presentation purposes, operation expenditure is presented only between 2016 and 2022 and for 2026 when operation are expected to be at their peak. Operations expenditure is assumed to remain constant at $730 million between 2026 and when operations cease.

Table 16-16 Direct expenditure – operation ($m)

Year	2016	2017	2018	2019	2020	2021	2022	2026
MIW region	94	162	203	246	289	331	386	509
(Other) Queensland	31	53	67	81	95	109	127	168
Outside Queensland	10	17	21	26	30	34	40	53
Total	135	232	291	352	415	474	553	730

The WRC and IRC regions have recently experienced a downturn in the economy due to the closure of local mines, retrenching, and delays in the commencement of some major projects. Data and more information on the economic decline in the NGBR Project area is described in detail in Volume 2, Appendix N Economics. NGBR Project consultations (June 2013) with Whitsunday Marketing and Development Ltd revealed that small businesses have been affected by the downturn in the region, particularly in Bowen and Collinsville. Businesses have been forced to scale down, diversify their offer or in some cases close down. As a result, local individuals and businesses have expressed a strong desire to register their interest for the NGBR Project in relation to employment and the supply of goods and services (refer to Volume 2 Appendix B Public consultation).

Currently, there are a number of businesses within the region, specifically in Bowen, Collinsville and Moranbah that service the mining and construction industries, they include but are not limited to:

- Auto electrical services and mechanical workshop services
- Building and construction services
- Plumbing services
- Electrical contracting
- Earth moving
- Food supplies
- Fuel supplies transport – overnight and general freight
- Welding
- Tyre repair services
- Heavy haulage services.

The extent to which local and regional businesses will be able to supply goods and services to the NGBR Project will depend on a number of factors including the ability of businesses to meet demand and staff attraction and retention in local businesses.

A local content strategy in accordance with the Queensland Resources Council's (QRC) Code of Practice for Local Content (2013) and associated Implementation Guidelines is proposed to establish linkages between the NGBR Project and local and regional businesses. Additionally, the opportunity exists for Adani to partner with Whitsunday Marketing and Development Ltd. on

their Whitsundays Industry Workforce Development project which aims to build a sustainable, skilled, local workforce capable of meeting the industrial expansion of the Whitsundays region. Refer to Section 16.6.1 for management strategies on local content including strategies for WRC and IRC LGAs.

As part of indirect benefits to the region, there is potential that the NGBR Project workforce when off roster may contribute to the tourism activities in the WRC region.

Local employment opportunities

Employment is an important indicator of economic activity and household welfare. The estimated employment change in terms of direct and indirect employment has been modelled at the MIW regional level and across Queensland for the construction phase of the NGBR Project.

As outlined in the NGBR Project workforce profile in Section 16.4, there will be a considerable construction and operation workforce required for the NGBR Project. As shown in Table 16-17, it is estimated that the NGBR Project will generate approximately 6,150 direct and indirect jobs in the MIW region in the peak construction year, 2015. For comparison, the ABS estimates that there were just over 91,000 persons employed in the MIW region in 2011/12. It is estimated that the NGBR Project will generate in excess of 2,000 direct and indirect jobs in the MIW region per year in 2014 and 2016 and over 6,000 in 2015 during peak construction. Across Queensland, the NGBR Project is expected to generate just under 7,000 direct and indirect jobs in 2015.

Table 16-17 Direct and indirect effects on employment during construction

Year	2014 (FTE)*	2015 (FTE)	2016 (FTE)
MIW region			
Direct	775	1,700	785
Indirect	1,669	4,452	2,006
Total	2,444	6,152	2,791
Queensland			
Direct	891	2,017	927
Indirect	1,864	4,981	2,244
Total	2,755	6,998	3,172

* Employment numbers are expressed in FTE terms

At the peak of operation expenditure (between 2026 and 2064), total (direct plus indirect) employment in the MIW region is expected to reach 1,097 FTE positions each year which represents almost 1.2 per cent of the estimated employment for the MIW region for 2011/12 (90,514 full time equivalent positions). For Queensland, direct and indirect employment is expected to be 1,940 FTE in 2026 which would account for a 0.1 per cent increase of total FTE employment in Queensland compared to 2011/12 levels (2.02 million FTE).

Table 16-18 Direct and indirect effects on employment during operation

Year	2016	2017	2018	2019	2020	2021	2022	2026
MIW region								
Direct	50	77	106	130	157	191	236	277
Indirect	169	287	356	427	498	563	647	820
Total	218	364	462	557	655	754	883	1,097
Queensland								
Direct	66	103	141	173	209	254	315	369
Indirect	324	550	683	818	955	1,079	1,239	1,571
Total	390	653	824	991	1,164	1,333	1,554	1,940

Demographic data in the baseline indicates that there are already a number of people in the regional study area with suitable skills for working on the construction and operation of rail projects (refer Section 3.4, Volume 2 Appendix M Social baseline). Consultations with Whitsunday Marketing and Development Ltd identified that a high proportion of train operators are already based in Bowen. Unemployment is very low in the IRC LGA (1.2 per cent in March 2013), but comparatively higher in the WRC LGA (6.5 per cent in March 2013) (refer employment and unemployment data in Volume 2 Appendix M Social baseline), indicating that there are opportunities to locally source some of the workforce for the operation phase of the NGBR Project.

Construction workforce will be provided by contractors and subcontractors, and any opportunities for local employment are likely to be through these contractors and subcontractors, who will be expected to abide by Adani's local content strategies and as stated in the NGBR Project workforce profile 20 per cent of the construction workforce is expected to be sourced from the regional area.

During rail operation, local employment opportunities will be proportionally much higher, with around 369 workers required by 2026. It is expected that workers for the rail operation will be recruited from the regional study area, where possible, and based in Bowen. Rail operation will involve shift work, but due to the proximity to major towns such as Bowen, workers will be able to return home between shifts ending at Abbot Point.

Indigenous employment and opportunities

Adani has commenced engagement with traditional owners and Indigenous groups through the Cultural Heritage Management Plan and Native Title processes and through associated stakeholder consultation activities. Adani will continue to work with traditional owners and Indigenous groups to further develop Indigenous business and employment opportunities. Adani will also work with Indigenous employment agencies, and State agencies such as the Department of Aboriginal and Torres Strait Islander and Multicultural Affairs (DATSIMA) to provide employment opportunities for Indigenous people in the region.

Indirect benefits for the regional and state economies

The economic modelling undertaken for the NGBR Project indicates that there is significant potential for the NGBR Project to produce significant positive impacts on the regional and State economies.

GRP and GSP are measures of the net contribution of an activity or industry to the economy. GRP and GSP represent payments to the primary inputs of production (labour, capital and land). GRP is the regional level and GSP the state level equivalent of GDP. Estimates of the change of the NGBR Project on GRP and GSP during the construction phase are presented in Table 16-19. In 2015, the peak construction year, it is estimated that the NGBR Project will contribute $791 million to GRP in the MIW region and $909 million to Queensland's GSP. This represents a 3.8 per cent change against baseline GRP and a 0.3 per cent change against baseline GSP.

Table 16-19 Direct and indirect effects on GRP and GSP during construction ($m)

Year	2014	2015	2016
MIW region (GRP)			
Direct	70	153	71
Indirect	238	638	290
Total	308	791	361
Queensland (GSP)			
Direct	85	195	90
Indirect	265	714	325
Total	350	909	415

The NGBR Project is also estimated to generate significant economic benefits over a sustained period of operation. Economic effects resulting from operation on the NGBR Project are expected to rise as expenditure and production increases. The impact of the NGBR Project on GRP and GSP is presented in Table 16-20.

In 2026, the peak year for operation expenditure, modelling estimates that the direct and indirect effects of the NGBR Project on GRP in the MIW region, is expected to be $209 million. The contribution to GRP will remain steady at $209 million per annum between 2026 and the end of the project. For Queensland, the NGBR Project is expected to generate GSP of $369 million in 2026 and each year after between 2026 and 2064. In the context of Queensland's GSP in 2011/12 ($283.6 billion), the estimated GSP effect attributable to the NGBR Project would represent an increase of almost 0.2 per cent (ABS 2012b).

Table 16-20 Direct and indirect effects on GRP and GSP during operation ($m)

Year	2016	2017	2018	2019	2020	2021	2022	2026
MIW region (GRP)								
Direct	13	22	27	33	39	44	52	68
Indirect	26	45	56	68	80	91	106	140
Total	39	66	83	101	119	136	158	209
Queensland (GSP)								
Direct	17	29	36	44	52	59	69	91
Indirect	51	88	111	134	158	180	210	277
Total	68	117	147	178	210	239	279	369

Significance rating – local and regional employment and businesses

Table 16-21 shows the significance rating for the identified potential impacts on local economic growth and regional development.

Table 16-21 Significance rating – local and regional employment and businesses

Impact	Project phase	Impact receptor	Likelihood	Consequence	Impact significance	Nature of impact
Opportunities for local and regional businesses in Bowen, Collinsville and Moranbah to supply goods and services to the project	Construction and operation	Local businesses	Likely	Moderate	**High**	Positive
Increased employment opportunities available for local and regional workforce	Construction and operation	Local and regional workforce	Likely	Moderate	**High**	Positive
Providing employment and training opportunities for Indigenous people	Construction and operation	Indigenous Community	Likely	Minor	**Medium**	Positive
Indirect benefits for regional, state and national areas	Construction and operation	Regional, State and National communities	Likely	Moderate	**High**	Positive

16.5.2 Workforce impacts

Section 16.4 provides a description of the workforce profile including the anticipated characteristics of the workforce, and detailed workforce numbers. The data is based on a probable scenario and are subject to vary during contract negotiations. According to the estimated NGBR Project workforce profile the construction workforce is proposed to be sourced 80 per cent on a FIFO basis and 20 per cent on a DIDO/BIDO basis, while the operation workforce is expected to be based in Bowen.

Impacts on communities located near the NGBR Project area

As understood from the NGBR Project consultations (June, 2013), as well as research undertaken in the Bowen Basin by Petkova *et al* (2009), Rolfe, J., *et al*.(2006) typical impacts that may arise from a non-resident, single, male workforce have historically been considered to have a negative impact on the social fabric of a community. Historical concerns include issues such as impacts on community cohesion and security, especially for women.

However, the NGBR Project consultation (June 2013) with the QPS and IRC, indicated that anti-social behaviour and disturbances from non-resident workers both in accommodation camps and in town have been negligible in recent times. As discussed in the consultations with QPS and IRC, it can be inferred that the shift in workforce behaviour may be due to the enforcement of strict workers code of conduct in regard to anti-social behaviour and serious consequences if an incident occurs. This was also supported by crime data that does not point to higher incidence of crime in towns where there is a high proportion of non-resident workers.

Stakeholders noted that there are benefits in having non-resident workers visit towns, particularly in relation to expenditure at local businesses. The location of temporary construction camps closer to local towns provides the opportunity for workers to visit the towns' to access services such as shops, medical services and restaurants and takeaway food stores (a regional economic benefit).

Stakeholders highlighted that the distance of the proposed NGBR Project construction camps from local towns may inhibit the potential for workers to access local services, thus restricting benefits to local businesses. However, there is potential for some operation workforce and their families to relocate to Bowen, which may contribute positively to the Bowen community as they will be actively accessing shops, medical services, grocery stores and restaurants, attending local schools and participating in sporting clubs and community events.

Impact on workers and families

A workforce related issue, applicable to FIFO workers and their families, identified by the stakeholders consulted for the NGBR Project, was a concern regarding the correlation between FIFO workforce arrangements and an increase in mental health issues. It was felt that the absence of one parent while on roster places additional pressure on the other parent who effectively becomes a sole parent during the worker's absence, and also means that the parent working remotely may miss a number of important family events such as birthdays and anniversaries. Parents working away from home may also find it difficult to adjust to the very contrasting environments of life in a temporary workers accommodation camp and life in the family home. Even where there are no children at home, the extended absence of one partner can also cause stress in adult relationships. Equally for singles, reintegrating with friends when off roster and back home can be difficult, particularly where social activities at the home base are organised around traditional weekends rather than rosters. These impacts on the FIFO

workforce and their families are also well documented in several research publications such as Hubinger, *et al.* (2002) Kaczmarek, E. A. and Sibbel, A. M. (2008) Murray and Peetz (2008).

Adani is aware of the potential impacts of a large FIFO workforce located a considerable distance from the nearest town. Adani will develop or expect the contractors to have in place Workforce Management Plans which seek to address these issues and include programs in relation to individual health and wellbeing including management of medical conditions when away from home, maintenance of physical fitness, management of stress and isolation, healthy eating and alcohol consumption. However due to the short-term and temporary nature of construction phase and family friendly rosters (14 days on and seven days off as opposed to 21 days on and sever days off) (refer Section 16.4) impacts on workforce and their families are expected to be minimal.

Table 16-22 summarises the impacts on workforce and their families.

Table 16-22 Significance rating – workforce impacts

Impact	Project phase	Impact receptor	Likelihood	Consequence	Impact significance	Nature of impact
Potential impacts on local communities from anti-social behaviour from non-resident, single male workforce	Construction	Landholders and community in Bowen	Rare	Moderate	**Low**	Negative
Potential mental health issues for workforce due to isolation and separation from families and friends	Construction	Workforce and their families	Rare	Moderate	**Low**	Negative

16.5.3 Landholder impacts

Land fragmentation and access to and within properties

As outlined in Section 16.3.1, the NGBR Project traverses a total of 64 properties, creating potential severance issues on properties which may impact on agricultural land, cattle grazing, agricultural infrastructure, other related activities and property values.

This has the potential to create property management issues for landholders, particularly in relation to access to various parts of the properties, movement of stock and equipment across and between properties.

The NGBR Project final rail corridor has been designed to minimise impacts and avoid fragmentation of properties resulting in the creation of non-productive portions, where possible. Additionally, the NGBR Project final rail corridor has been designed to avoid homesteads and associated infrastructure as far as practicable.

As the life of the project is 90 years, this has the potential to sterilise land within final rail corridor footprint for the duration (noting that areas for ancillary infrastructure outside of the final rail corridor will be rehabilitated following completion of construction). Further consultation will be undertaken with landholders as part of detailed design and land acquisition processes to minimise land fragmentation impacts through a range of measures, including appropriate access arrangements and determining optimal locations for stock and occupational crossings of the railway line. Where feasible, grade-separation will be provided, otherwise, gates, fenced yards and corridor fencing will be installed to prevent interactions with trains. Final stock and occupational crossing locations and fencing arrangements will be developed in consideration of ongoing landholder consultation and are considered further in Volume 1 Chapter 14 Transport.

The properties intersected by the NGBR Project final rail corridor are predominantly large. Of the total 64 properties, 22 properties have an area greater than 10,000 hectares. It is estimated that a small proportion of land for each property will be affected by the NGBR Project final rail corridor (average of 0.5 per cent of each property). However, it is recognised that each property is different in terms of its size, land use, productivity and economic viability; hence management strategies will be developed in consultation with individual landholders on a case by case basis.

Impacts on surface drainage and flooding

Construction of the final rail corridor has the potential to create issues associated with water ponding and exacerbation of flooding potential through changes to existing surface water drainage. Adani has commenced consultation with landholders who's properties may be subject to increased flooding.

Flooding and surface drainage issues are addressed in detail in Volume 1 Chapter 9 Water resources. Based on this chapter it can be summarised that the NGBR Project design includes preliminary sizing for waterway crossings such as bridges and drainage culvert to manage afflux. While some amount of afflux is unavoidable due to the proposed structures, preliminary analysis indicates this is generally limited to areas within the final rail corridor and does not pose an impact to any existing infrastructure. Refinement of the NGBR Project design through the detailed design phase will help to ensure that no existing buildings, structures or other infrastructure will be adversely affected. Flood modelling and analysis will continue to be undertaken at subsequent stages of NGBR Project engineering development to further refine hydrological estimates and design of flood mitigation options. Recent flood mapping completed for major waterways intersected by the NGBR Project has indicated that impacts are within the flood level and flow criteria for approved railway projects in Central Queensland. Landholders will continue to be consulted regarding these impacts throughout NGBR Project planning prior to construction.

Spread of weeds

During land access consultations landholders identified that there is a potential risk that weeds could be spread by NGBR Project vehicles and personnel accessing various properties during construction and operation (maintenance). This has the potential to affect grazing pastures and stock. These impacts are assessed and managed in Volume 1 Chapter 6 Nature conservation and Volume 2 Appendix P Environmental management plan framework.

Impacts on economic viability of the land

The NGBR Project will require acquisition of land on properties intersected by the final rail corridor. Whilst the final rail corridor has been developed so as to avoid and minimise the extent of intrusion into properties, the NGBR Project will fragment some properties. Landholders will lose agricultural land under the final rail corridor footprint, and additionally may lose access to other parts of their properties, which could potentially affect productivity and the economic viability of their businesses.

As stated in Section 16.3.1, a total of 64 properties will be impacted by the NGBR Project. It is estimated that in total, 3,248 hectares of land will be impacted. Of this 1,562 hectares is grazing land; 1,669 hectares is Good Quality Agricultural Land (557 hectares of Good Quality Agricultural Land will be temporarily sterilised) and 17 hectares is Strategic Cropping Land (refer to Volume 1 Chapter 3 Land use and tenure and Volume 1 Chapter 5 Topography, geology, soils and land contamination).

As outlined in Volume 1 Chapter 3 Land use and tenure, land use in the study area is predominantly for the purposes of cattle breeding and fattening. The market value of grazing land in the region varies between $500 and $2,000 per hectare depending on the quality of improvements and the quality of the land (market value of grazing land based on advertised prices of properties for sale in the region as listed on real estate websites in June 2013) (refer to Volume 1 Chapter 5 Topography, geology, soils and land contamination). Established houses, stockyards, fencing and water supply infrastructure all contribute to the value of grazing land. Assuming an average value of grazing land of $1,250 per hectare, the impact on the value of grazing land is estimated to be $$4.06 million. Expressed as an annuity over ten years at 10 per cent, this represents a cost of just under $0.7 million per annum.

Consultation with the landholder representative group Corridor to Coast identified that landholders are concerned about the potential decrease in their property values and associated impacts to the viability of their business; where they are required to sell portions of their properties. Landholders are also concerned that they may be increasingly inconvenienced by the additional time and/or financial burden required to manage the following activities:

- Interaction with NGBR Project staff during design, construction and operation
- Additional time and staff required for stock movement between paddocks (where paddocks have been fragmented by the final rail corridor)
- Potential increase in the loss of cattle due to cutting of fences and opening of gates on properties required for NGBR Project staff to gain access to the final rail corridor
- Additional costs incurred by landholders in repairing fences and internal property roads that may be damaged by NGBR Project vehicles activities.

Impacts to livestock

During consultation undertaken for the NGBR Project in June 2013, there were concerns raised regarding the potential for cattle and other animals to be disturbed during construction and operation activities. They also expressed that there is the potential that livestock may be negatively impacted by noise and dust during construction and operation, potentially affecting the productivity and the economic viability of the business. However, coal dust deposition is unlikely to have a major impact on livestock within the surrounding region. Additionally, noise emissions from the NGBR Project are not expected to adversely impact livestock (refer to Volume 1 Chapter 6 Nature conservation).

Further it is noted that wait times at grade stock crossings may cause some distress to cattle; it is anticipated that wait times will generally be in the order of five to thirty minutes (note that grade-separated stock crossings are not expected to significantly impede stock movement across the final rail corridor). Cattle will need to be yarded up on one side of the rail line, until clearance is obtained from train operation control. This could all take substantially more time than current practices but not long enough that cattle will lose condition. This could however mean that landholders may require more resources such as time and staff to carry out these activities via at-grade stock crossings.

Impacts to lifestyle

Through consultations with landholders, landholder representatives and other EIS technical specialists, it was inferred that the rail construction and operation activities will cause changes to the natural environment such as air quality, noise and visual amenity resulting in minor alterations to the rural surrounding of homesteads. The above mentioned alterations to the environment and the additional land access related activities that the landholders will need to undertake may disrupt the rural agricultural lifestyle, potentially leading to loss of privacy and a sense of insecurity due to the presence of construction, operation, and maintenance workforce on their property. These issues have been perceived to contribute to increased levels of stress and anxiety as understood from the NGBR Project landholder consultations and other Social Impact Assessments for similar projects such as the Alpha Coal Rail Project (GHD, 2010).

Processes relating to land access and land acquisition for major projects can be time consuming and stressful for landholders. This stress may cause or exacerbate personal and interpersonal issues. Despite the potential for compensation for loss of land and earnings, landholders may perceive a residual sense of loss associated with the potential changes to the land.

Adani will seek to minimise stress to landholders through appropriate land access protocols and appropriate consultation and negotiation processes. Landholders are further able to access and obtain independent support from legal advisers, land valuation specialists and other professionals during the process.

Impacts to amenity and health

Amenity may be impacted during both the construction and operation phases as a result of dust, noise, vibration, lights used during construction at night and coal dust (during operation). Various technical studies undertaken in the NGBR Project EIS have assessed impacts on these amenities in relation to the homesteads located on the properties intersected by the NGBR Project, key findings from these studies are summarised below:

- Air quality impact assessment (refer Volume 1 Chapter 10 Air quality) - The air quality assessment found that ground-level concentrations of all air pollutants released from the Project are predicted to be well below the Environmental Protection (Air) Policy objectives at the closest sensitive receptor, 1.1 km from the NGBR Project
- Scenic amenity impact assessment (refer Volume 1 Chapter 4 Scenic amenity and lighting) - The visual impact assessment has identified that three homesteads during construction and two during operation will have a moderate visual impacts meaning there will potentially be a moderate visual modification to the landscape. These impacts mainly arise due to proximity (over one kilometre) of the homesteads to the final rail corridor.

- Noise impact assessment (refer Volume 1 Chapter 12 Noise and vibration) - The noise and vibration impact assessment has identified that potentially 10 homesteads during construction and two homesteads during operation may experience noise impacts as a result of NGBR Project. However, it is important to note that these impacts are based on the 'worst case' scenario and actual noise at sensitive receptors is likely to be lower than predicted and temporary in relation to the potential construction impacts.

Landholders are concerned about the increased risk of fire due to the presence of trains and construction and maintenance vehicles on their properties, impacting families and businesses that rely upon their properties for livelihoods. Landholders may find themselves burdened with increased demands to respond to fires. A number of NGBR Project design measures will be in place to manage the fire risk, such as a 100 meter wide corridor which will act as a fire buffer, and the use of concrete sleepers will also reduce the risk of fire. A comprehensive Hazard, risk, health and safety assessment has been undertaken for the NGBR Project (refer Volume 1 Chapter 18 Hazard, risk, health and safety), under which an Emergency Management Plan will be put in place to manage bushfires and respond to emergencies (refer Volume 2 Appendix P Environmental management plan framework).

Table 16-23 summarises the potential impacts on housing and accommodation.

Table 16-23 Significance rating for landholder impacts

Impact	Project phase	Impact receptor	Likelihood	Consequence	Impact significance	Nature of impact
Impacts on properties intersected by the NGBR Project - land fragmentation and access to and within the properties	Construction and Operation	Directly impacted landholders	Almost certain	Moderate	**High**	Negative
Changes to the natural environment from changes to overland flow paths with potential for increased ponding and flooding	Construction and Operation	Directly impacted landholders	Possible	Major	**High**	Negative
Potential risk of spread of weeds and weed seeds	Construction and Operation	Directly impacted landholders	Possible	Minor	**Medium**	Negative
Impacts on productivity and economic impacts – increase in workload for landholders, decrease in property values, decrease in viability of agricultural business due to disruption in cattle operation and increased time and resources required to manage cattle	Construction and Operation	Directly impacted landholders	Almost certain	Moderate	**High**	Negative
Changes to the living environment from increased noise and dust and reduced visual amenity and loss of privacy	Construction and Operation	Directly impacted landholders	Likely	Minor	**Medium**	Negative
Anxiety and stress associated with land access and acquisition discussions and negotiations	Construction	Directly impacted landholders	Likely	Minor	**Medium**	Negative
Increased fire risk along the rail corridor	Construction and Operation	Directly impacted landholders	Unlikely	Minor	**Low**	Negative

16.5.4 Housing and accommodation impacts

Historically regional communities have been concerned that direct effects from projects with large workforces and/or the cumulative effects from a number of projects have exacerbated shortages in housing supply. This has led to decreased housing affordability and higher living costs for everyone, particularly those not employed in the resources sector (refer Section 4.5, Volume 2 Appendix M Social baseline).

During consultations held in June 2013 for the NGBR Project SIA, it was noted (anecdotally) that such effects were observed in key resource towns within the regional study area over 12 months ago. Consultations and media releases (Daily Mercury, 25 May, 2013 and Financial Review Business Intelligence, 20 May, 2013) revealed that in the regional study area, the downturn in the resources sector had resulted in a number of people moving out of the region within the past 12 months, which has subsequently increased housing availability and improved housing affordability.

As identified in the regional social baseline (refer Section 3.5, Volume 2 Appendix M Social baseline) the rental vacancy rates for Bowen and Collinsville in April 2013 were 8.8 per cent and 23.2 per cent respectively for all rental properties. There was a minor decline in the median housing price in Bowen from 2011 to 2013 and a significant dip in Collinsville from 2012 to 2013. In addition, recent searches from realestate.com show a significant number of properties available for sale and rent in Bowen, Collinsville and Moranbah (refer to Section 16.3.2 for number of properties available for rent and purchase). However, whilst supply is not an issue, in consultation with WRC it was suggested that quality of the housing stock is poor with much of the stock being old, degraded and in need of renewal.

There is a strong desire from local communities to attract rail and associated support industry workers and their families into the community. Consultation undertaken for the NGBR Project indicated that land development is continuing to occur in Collinsville and Bowen, with new land being made available for residential subdivisions. However, future growth in the towns is limited by urban development constraints. Expansion of Collinsville is limited by adjacent mining tenures, proximity to the Newlands rail line and other constraints, such as flooding. The expansion of Bowen is limited by its coastal location, impacts of flooding from the Don River and proximity to highly productive rural lands (Queensland Government, 2012). The consultations also highlighted the water supply and sewerage facilities for Bowen as a constraint for future growth.

Impacts on housing availability and affordability

As seen in the workforce profile (refer Section 16.4), it is proposed that 80 per cent of the NGBR Project's construction workforce will be sourced on a FIFO basis and housed in five construction camps located along the rail corridor. It is expected that 20 per cent of the construction workforce will be sourced from the regional study area on a DIDO or bus-in / bus-out (BIBO) basis and it is anticipated that these workers would be existing residents. All of the non-resident (FIFO) construction workforce will be accommodated in temporary construction camps and will therefore not place any additional demand on local housing.

It is anticipated that the operation workforce will be a combination of workers already residing in Bowen and some that might move into the region seeking employment opportunities. At this stage it is not possible to estimate the split between these two scenarios. As stated in the workforce profile (Section 16.4.2) the operation workforce will ramp up from 66 workers in 2016 to 369 by 2026. Given that the operation workforce will slowly ramp up over a 10 year period, it is not likely to lead to any significant population increase in proportion to the existing and

forecast population for Bowen. It is therefore, anticipated that the NGBR Project may not impact on the housing availability and affordability in Bowen as a result of operation activities.

It is recognised that the NGBR Project's demand for housing may contribute to cumulative impacts on housing availability and affordability. A number of expansion projects are proposed to occur at the Port of Abbot Point; however many of these are currently on hold or awaiting final investment commitment. Depending on the timing of these projects, there may be an increased demand for housing in the area, which may result in increased housing costs. High costs of housing and rent has the potential to disadvantage individuals and families not engaged in higher income earning activities. As identified in the regional social baseline (refer Volume 2 Appendix M Social baseline Section 3.4), it is acknowledged that a proportion of the population in Bowen is transient (5.3 per cent of the total FTE population in Bowen, refer to Volume 2, Appendix M Social baseline Section 4.2.3) in nature due to the agricultural and tourism industry. This transient, seasonal population coupled with an increase in mining and infrastructure projects may exacerbate housing availability during peak demand periods such as from September to April each year, which is the peak tourism and harvest season.

Table 16-24 summarises the potential impacts on housing and accommodation.

Table 16-24 Significance rating – housing and accommodation

Impact	Project phase	Impact receptor	Likelihood	Consequence	Impact significance	Nature of impact
If there is existing shortage of housing availability, there is a potential to further exacerbate shortages in housing supply and decrease housing affordability in Bowen. However given the current housing situation in Bowen there is sufficient availability of housing to accommodate the operation workforce	Operation	Local community	Rare	Insignificant	**Low**	Neutral

16.5.5 Community health and wellbeing impacts

As part of community health and wellbeing the social impact assessment has considered impacts on population changes, lifestyle and amenity, health services, emergency services and traffic safety. Impacts on each of these indicators are discussed as follows.

Impacts on demographic change

During the construction phase, it is anticipated that 80 per cent of the construction workforce (1,360 workers at peak) will be sourced on a FIFO basis, and, when on roster, will reside in temporary construction camps located along the rail corridor. This will increase the non-resident (FTE) population of the WRC area, as all of the rail construction camps are proposed to be located in WRC. However as the camps will be away from any urban localities, they are not likely to affect any particular population centres. However the temporary increase in non-resident population has the potential to place demand on regional social infrastructure services and facilities. This is not considered favourable by the regional community in general, because the allocation of services is based on the count of permanent/resident population and not on the FTE population (refer to Volume 2, Appendix M Social baseline Sections 4.2.3, 4.6)

As described in the workforce profile (refer Section 16.4), operation workforce will ramp up over a period of 10 years from 66 workers in 2016 to a peak workforce of 369 workers by 2026. It is proposed that the operation workforce will be located in Bowen. Recruitment will include a combination of existing residents of Bowen and those that may choose to relocate into Bowen, however it is Adani's preference to source already existing workforce as far as possible. As it is not possible to estimate the split between the resident and relocating workers at this stage, the contribution of the project to the population of Bowen cannot be predicted. However, as the number of workers required is small and will gradually ramp up over a period of 10 years, it is unlikely to have a significant impact on the populations beyond what is already factored into population forecasts.

The only other source of demographic change at a local and regional level may arise from stimulation to the local and regional economy which in turn may lead local businesses to expand in order to be able to supply goods and services to the NGBR Project. This may require recruitment from outside the regional study area and, in this case, it is likely that workers and families would relocate to the area. Associated population changes would be minimal, gradual (over 10 years from start of operation to peak operation workforce) and perhaps spread around other urban localities in the region.

Impacts on lifestyle and amenity

The NGBR Project footprint and the construction workforce camps will be located away from any urban localities in the regional study area. The remote location of the NGBR Project and the workers camps will minimise potential impacts on community values, lifestyle and amenity typically associated with a rail project and its non-resident, predominantly single male workforce.

However, it is anticipated that the NGBR Project will cause changes to the natural environment within the local study area and primarily impact on the lifestyle and amenity of the landholders there. Lifestyle impacts on landholders are discussed in Section 16.5.

Impacts on the amenity of the landholders and the wider community are assessed and managed in other technical studies included in the NGBR Project EIS. Technical studies relevant to the amenity impacts are listed in Table 16-25.

Table 16-25 Technical studies relevant to landholder amenity impact management

Other technical studies	Key mitigation and management measures included in these technical studies
Volume 1 Chapter 10 Air quality	Develop and implement a Dust Management Plan.
Volume 1 Chapter 12 Noise and vibration	Implement noise management levels and use these as a guide to apply specific mitigation measures based on the anticipated noise levels of each activity. Inform potentially affected receivers of timing and duration of works and the times/dates of anticipated high impact activities. Develop and implement a Noise and Vibration Management Plan.
Volume 1 Chapter 4 Scenic amenity and lighting	Only necessary vegetation clearing is to be undertaken with all areas not required for site operation remaining uncleared. Temporary hoarding, barriers, traffic management and signage to be removed when no longer required. Develop and implement a Dust Management Plan. Materials and machinery to be stored tidily, particularly in area which may be visible to external observers. Limit night time activities as far as is practicably possible. Progressive rehabilitation of temporary infrastructure sites and non-operation areas. Vegetation plantings around maintenance facilities and adjacent to the NGBR Project final rail corridor in sensitive locations where landowner permission is granted. Mitigation of light pollution through: • Specifying appropriate luminaires to reduce light spill, sky glow and glare • Sensitive placement and specification of lighting to minimise any potential increase in light pollution within the natural environment.

Other technical studies	Key mitigation and management measures included in these technical studies
Volume 1 Chapter 14 Transport	Develop and implement a Traffic Management Plan including a Road Use Management Plan in consultation with Department of Transport and Main Roads to address road use, safety and traffic flow issues. Designated access points to the final rail corridor to minimise direct access and therefore disturbance to properties. Major road crossings will generally be grade-separated and minor road crossings will be at-grade including levels of protection (active and/or passive). Improvements to minimise vehicular interaction with existing users and the community will also be made including intersection treatments, proper signage, adequate lighting, segregation of heavy vehicles and speed management.

Impacts on health services

All workers on the NGBR Project will be expected to be fit for duty before commencing work on site and to address general health requirements in their home communities before deployment. Workers will also be required to undertake fit for duty health screening prior to employment. Site-related medical issues will be dealt with largely on-site by site first aid services. However, for injuries and health incidences beyond first aid, both the non-resident workers and the workers who choose to reside in Bowen will rely on local medical services for themselves and their families.

Existing shortfalls and challenges to health service provision in the regional study area as described in the regional social baseline (refer Section 3.6, Volume 2 Appendix M Social baseline) are not specific to the NGBR Project, but cumulatively the NGBR Project may contribute to impacts on these pre-existing issues.

Impacts on emergency services - fire and rescue, ambulance and police

In accordance with the *Queensland Fire and Rescue Act 1990, Work Health and Safety Act 2011* and building regulations, Adani will have Health and Safety Plans and Emergency Management Plans in place for all aspects of construction and operation of the NGBR Project (refer Volume 1 Chapter 17 Hazard, risk health and safety). These plans will consider first aid and basic medical services, fire prevention and fire fighting equipment and security.

However, there will be instances where the NGBR Project will have to rely on local emergency service providers such as Queensland Ambulance Services (QAS) for transporting patients to the hospital, QPS for police presence in the case of an incident or death at the project site or workers camp and Fire and Rescue Services (QFRS) in case of an incident.

During consultations with Queensland QFRS it was noted that the NGBR Project will be covered by the rural fire brigade. The rural fire brigade is mainly dependent on volunteers, who are not obliged to respond to incidents and who are not trained for rescue services. QFRS has requested that Adani continues to engage with them for appropriate emergency planning, including appropriate sharing of responsibilities between the NGBR Project, QFRS, landholders and other projects in the area (such as Aurizon's existing rail network).

Although the NGBR Project will implement a Workforce Management Plan including a compulsory workers code of conduct and driver training, it may have to rely on QPS services in case of death or higher order crime. Crime in the region is not unique to mining activities or workforce, the main issues in the region include traffic incidents, drink driving, assaults, wilful damage, noise complaints and alcohol and drug abuse (refer to Volume 2, Appendix M Social baseline Section 4.7.4). NGBR Project consultation (June, 2013) with QPS suggested that in recent times incidences at workers camps or projects sites have been negligible. However, due to the remote location of the NGBR Project, it would be challenging to service the NGBR Project in entirety, due to overall shortfalls in the QPS staffing.

NGBR Project consultation (June 2013) with QAS suggested that though the NGRB Project may not specifically impact on the service capacity of QAS, due to the remote location of the NGBR Project there may be challenges relating to travel time and distance and access to sites. To alleviate these challenges QAS has suggested a range of measures to be included in the NGBR Project Emergency Management Plan (refer to Volume 2 Appendix P Environmental management plan framework). Emergency management planning for the NGBR Project is in progress and will include ongoing consultations with QAS, QFRS and QPS and local and regional disaster management groups (led by WRC and IRC) as appropriate (refer to Volume 1 Chapter 18 Hazard, risk, health and safety, Volume 1 Chapter 21 Environmental management and Volume 2 Appendix P Environmental management plan framework)

Impacts on traffic and safety

At a regional level, construction of the NGBR Project will require the use of local roads to transport construction equipment, machinery and workforce to and from the NGBR Project. This will result in increases in road traffic which may cause delays and inconvenience to the local communities as well as heightened safety risks to workers and the local community.

During the construction phase, traffic is expected to be generated by the transport of goods and services and bussing of the workers from airports to workers camps and from workers camps to the project site (and associated return trips). It is likely that effects on traffic and transport will occur as a result of the NGBR Project.

With much of the transport of equipment to site being via road, there is a risk of damage to road infrastructure, especially the local roads which are not designed for heavy and wide traffic. Effects on traffic as a direct result of the NGBR Project can be expected, during construction, along major roads including Bowen Developmental Road, Gregory Developmental Road, Kilcummin Diamond Downs Road, Suttor Developmental Road, Cerito Road and the Bruce Highway due to an increased number of heavy vehicles transporting equipment and supplies to various locations along the final rail corridor.

The degree to which the NGBR Project will cause delays and inconvenience the local community or increase safety hazards are assessed in the transport impact assessment report (Volume 1 Chapter 13 Transport).

A number of mitigation measures are proposed to manage roads, traffic and safety in the Traffic Management Plan for the NGBR Project (Volume 1 Chapter 13 Transport, also refer to summary in Table 16-25) and will therefore not be managed as part of the social assessment.

Table 16-26 shows the potential impacts on community values, lifestyle and amenity.

Summary of social and economic impacts Table 16-27 summarises all the potential social and economic impacts identified in this impact assessment for the NGBR Project.

Table 16-26 Significance rating – Community health and wellbeing impacts

Impact	Project phase	Impact receptor	Likelihood	Consequence	Impact significance	Nature of impact
Temporary increase in non-resident (FTE) population in WRC has the potential to place additional demand on regional services and facilities	Construction	Community in WRC	Likely	Insignificant	**Medium**	Negative
Gradual increase in permanent population of Bowen	Operations	Community in Bowen	Likely	Insignificant	**Medium**	Positive
Changes to rural amenity and lifestyle of the landholders within the local study area from increased noise and dust and reduced visual amenity and loss of privacy	Construction and Operations	Directly impacted landholders	Likely	Minor	**Medium**	Negative
Changes to lifestyle and amenity of regional community	Construction and Operations	Regional community/ Bowen	Unlikely	Insignificant	**Low**	Negative
Potential increased demand on regional and local health services, potentially exacerbate shortfalls in GP services, nursing staff and hospital emergency services	Construction and Operations	Regional community/ Bowen	Likely	Minor	**Medium**	Negative
Potential increased demand on regional emergency services including fire and rescue, police and ambulance	Construction and Operations	Regional community /Bowen	Possible	Minor	**Medium**	Negative
Heightened safety risks to workers and the local community from increased project traffic, road crossings, stock and rail crossings	Construction and Operations	Landholders and Regional community	Likely	Moderate	**High**	Negative

Table 16-27 Summary of potential social and economic impacts

Impact	Project phase	Impact receptor	Likelihood	Consequence	Impact significance	Nature of impact
Regional development, local and regional businesses and employment impacts						
Opportunities for local and regional businesses in Bowen, Collinsville and Moranbah to supply goods and services to the project	Construction and Operation	Local businesses	Likely	Moderate	**High**	Positive
Increased employment opportunities available for local and regional workforce	Construction and Operation	Local and regional workforce	Likely	Moderate	**High**	Positive
Providing employment and training opportunities for Indigenous people	Construction and Operation	Indigenous Community	Likely	Minor	**Medium**	Positive
Indirect benefits from the project for regional, state and national areas	Construction and Operation	Regional, State and National communities	Likely	Moderate	**High**	Positive
Workforce impacts						
Potential impacts on local communities from anti-social behaviour from non-resident, single male workforce	Construction	Landholders and community in Bowen	Rare	Moderate	**Low**	Negative
Potential mental health issues for workforce due to isolation and separation from families and friends	Construction	Workforce and their families	Rare	Moderate	**Low**	Negative
Landholder impacts						
Impacts on properties intersected by the Project - land fragmentation and access to and within the properties	Construction and Operations	Directly impacted landholders	Almost certain	Moderate	**High**	Negative
Changes to the natural environment from changes to overland flow paths with potential for increased ponding and flooding	Construction and Operations	Directly impacted landholders	Possible	Major	**High**	Negative

Impact	Project phase	Impact receptor	Likelihood	Consequence	Impact significance	Nature of impact
Potential risk of spread of weeds and weed seeds	Construction and Operations	Directly impacted landholders	Possible	Minor	**Medium**	Negative
Impacts on productivity and economic impacts – increase in workload for landholders, decrease in property values, decrease in viability of agricultural business due to disruption in cattle operation and increased time and resources required to manage cattle	Construction and Operations	Directly impacted landholders	Almost certain	Moderate	**High**	Negative
Changes to the living environment from increased noise and dust and reduced visual amenity and loss of privacy	Construction and Operations	Directly impacted landholders	Likely	Minor	**Medium**	Negative
Anxiety and stress associated with land access and acquisition discussions and negotiations	Construction	Directly impacted landholders	Likely	Minor	**Medium**	Negative
Increased fire risk along the rail corridor	Construction and Operations	Directly impacted landholders	Unlikely	Minor	**Medium**	Negative
Housing and accommodation impacts						
If there is existing shortage of housing availability, there is a potential to further exacerbate shortages in housing supply and decrease housing affordability in Bowen. However given the current housing situation in Bowen there is sufficient availability of housing to accommodate the operation workforce	Operation	Local community	Rare	Insignificant	**Low**	Neutral

Impact	Project phase	Impact receptor	Likelihood	Consequence	Impact significance	Nature of impact
Community health and wellbeing impacts						
Temporary increase in non-resident (FTE) population in WRC has the potential to place additional demand on regional services and facilities	Construction	Community in WRC	Likely	Insignificant	**Medium**	Negative
Gradual increase in permanent population of Bowen	Operations	Community in Bowen	Likely	Insignificant	**Medium**	Positive
Changes to rural amenity and lifestyle of the landholders within the local study area from increased noise and dust and reduced visual amenity and loss of privacy	Construction and Operations	Directly impacted landholders	Likely	Minor	**Medium**	Negative
Changes to lifestyle and amenity of regional community	Construction and Operations	Regional community/Bowen	Unlikely	Insignificant	**Low**	Negative
Potential increased demand on regional and local health services, potentially exacerbate shortfalls in GP services, nursing staff and hospital emergency services	Construction and Operations	Regional community/Bowen	Likely	Minor	**Medium**	Negative
Potential increased demand on regional emergency services including fire and rescue, police and ambulance	Construction and Operations	Regional community/Bowen	Likely	Minor	**Medium**	Negative
Heightened safety risks to workers and the local community from increased project traffic, rail road crossings, cattle and rail crossings	Construction and Operations	Landholders and Regional community	Likely	Moderate	**High**	Negative

16.6 Mitigation and management strategies

Adani is committed to maximising potential opportunities and reducing potential negative impacts associated with the NGBR Project. This social impact assessment has been prepared in accordance with the CGs Social Impact Assessment Guidelines (July, 2013) (Queensland Government, 2013a) which outlines the State's preferred approach to undertaking social impact assessment. Mitigation measures and management strategies have been developed and will be implemented to address direct social impacts, which may arise during the life of the NGBR Project. Management strategies focus on the social impacts assessed as having a high significance rating.

As advised by the CGs Office the contribution of NGBR Project to the cumulative impacts of the local and regional study area will be addressed by the State through the Royalties for Regions Initiative and the Regional and Resource Town Action Plan (for details on these initiatives refer to Volume 1 Chapter 20 Legislation and approvals). The potential contribution of the NGBR Project to cumulative social and economic impacts is discussed in Section 16.6.1 and Volume 1, Chapter 19 Cumulative impacts.

While Adani has overall responsibility for the development, implementation and monitoring of the social and economic impact management strategies for the NGBR Project, some responsibilities will be devolved to the relevant construction and operation contractors, which will be part of the contractor's terms and conditions of engagement.

In accordance with the CGs new approach to social impact assessment, the management strategies will be developed with an adaptive, outcome-based methodology to commensurate with the level of associated impacts. Key themes for social and economic impact management include:

- Regional development, local and regional businesses and employment
- Workforce management
- Land management
- Housing and accommodation management
- Community health and wellbeing management
- Stakeholder engagement.

The management strategies developed for the NGBR Project are based on existing industry practice strategies, feedback from CGs office / various stakeholders during the NGBR Project consultation (June 2013) and review of recent CG reports for similar projects in the region. The impact management strategies developed for the NGBR Project are detailed in Sections 16.6.1 to 16.6.6. Table 16-33 provides a summary of the relevant social impacts associated with the NGBR Project and the respective avoidance, mitigation and management strategies proposed.

Due to the proposed life of the NGBR Project (i.e. 90 years), it is expected that the associated social impacts will vary over time subject to changes outside the control of Adani. Accordingly, the management strategies proposed are adaptive and will be reviewed and updated as required.

Based on the CGs requirements, Adani will monitor and review impacts and management strategies on an annual basis during the construction phase and the first two years of operation. Subsequent impacts and the respective management strategies will be reviewed annually and reported through Adani's annual reporting processes.

The impact management and monitoring strategies detailed in the following sections of the social impact assessment will be finalised prior to the commencement of construction and in consultation with relevant stakeholders.

In addition to managing direct social impacts potentially arising from the NGBR Project, as per the Social Impact Assessment Guidelines (July, 2013), Adani also seeks to make positive steps towards contributions for the community. Adani recognises that proactive community relations will provide benefits for both Adani and the communities in which they operate. In line with this goal and as an extension to the management of these direct social impacts, Adani will extend its existing community development plan to the NGBR Project.

The overarching objective of Adani's community investment approach will be for investment to be proactive, rather than reactive or developed in response to a direct stakeholder request. It is envisaged that initiatives will be focused on identified and verified community needs, and serve to simultaneously mitigate social risk and create a positive legacy for both the NGBR Project and associated communities. Investment opportunities will seek to empower community organisations to leverage additional benefits rather than relying only on short-term advantages. Adani will build community investment into its overall business and planning process, for integrating and delivering effective business outcomes and will seek to do this in a transparent and genuine manner.

Adani is committed to undertaking community and stakeholder engagement to identify potential opportunities for voluntary community investment activities in the NGBR Project study area.

16.6.1 Regional development, business and employment strategies

I-O modelling estimates that construction of the NGBR Project will generate up to 6,150 direct and indirect jobs in the MIW region in the peak construction year (2015). During 2015, it is estimated that the NGBR Project will contribute $791 million to GRP in the MIW region. Once the project reaches peak operations, it is estimated that the NGBR Project will create in excess of 1,000 full-time equivalent direct and indirect jobs in the MIW region per annum. The direct and indirect contribution to GRP in the MIW region during operation of the NGBR Project is estimated to reach just over $200 million per annum during peak operations (from 2026).

These positive economic impacts come at a time when the economy of the MIW region is not growing in real terms. The mining sector has been the dominant sector in the MIW region in terms of contribution to GRP. However, the contribution of the mining sector to GRP in the MIW region has declined in real terms over the last five years. This decline in the contribution to GRP translates into loss of regional business and jobs. Construction and operation of the NGBR Project is expected to generate significant, predominantly positive economic impacts for the MIW region.

To leverage the positive economic impacts of the NGBR Project for the MIW region, a Local Content Strategy, local employment initiatives and recruitment and training programs will be developed and implemented for the NGBR Project.

State government initiatives

As stated in the Legislation and Approvals chapter (refer Section 20.6.9 and 20.6.10, Volume 1 Chapter 20 Legislation and approvals) the Queensland Government has introduced two initiatives as tools for regional and resource town development and to address cumulative impacts arising from developments and resources projects in regional Queensland. These initiatives are summarised below, with their relevance to the regional study area.

Royalties for regions

The Royalties for Regions program was developed to help to channel funds from resource projects into regional communities for investment in strategic infrastructure development, ensuring that long term royalty benefits flow back into resource regions facilitating regional prosperity and improved quality of life for the locals (Queensland Government, 2013c). As part of this program the Queensland Government will invest $495 million from royalties over four years in new and improved community infrastructure, roads and floodplain security projects and an ongoing commitment of $200 million each year in the future (Queensland Government, 2013c).

The NGBR Project consultation (June, 2013) revealed that both the WRC and IRC have benefited from the Royalties for Regions program and will continue to do so in the future.

Regional and resource towns action plan

DSDIP has prepared the Regional and Resource Towns Action Plan to assist regional councils in addressing immediate gaps and shortfalls, through 'on the ground' projects to address local issues such as housing and land availability, affordability and supply procedures (Queensland Government, 2013b). The current Regional and Resource Towns Action Plan (March 2013) includes the IRC as one of the beneficiaries (Queensland Government, 2013b); the WRC was not included at the time of writing this chapter.

NGBR Project local content strategy

Adani recognises the potential benefits and opportunities that the NGBR Project can bring to the WRC and IRC LGAs. To leverage these opportunities a Local Content Strategy will be developed in accordance with QRC's, Queensland Resources and Energy Sector Code of Practice for Local Content 2013 and associated implementation guidelines.

To ensure the success of the NGBR Project, Adani is committed to the engagement, advancement and development of both the industry and the people in the communities in which it works. To build on this commitment and to maximise local content, Adani is committed to procurement from Australian suppliers as a preference and will endeavour to maximise local investment on the NGBR Project where it is capable and competitive by implementing its Local Content Strategy.

Adani will work with WRC, IRC, the economic development groups in the region such as Whitsunday Marketing and Development Ltd, and local businesses in conjunction with the Queensland Government (Office of Advanced Manufacturing) and the Industry Capability Network (ICN Gateway) in developing the Local Content Strategy to provide robust, integrated and sustainable local business participation opportunities. A number of suppliers in the region will be identified, including Indigenous businesses to supply to the NGBR Project, including servicing of construction camps, where possible.

Additionally, Adani will ensure that construction and operation contractors will abide with the Local Content Strategy as part of the tendering process, this includes (but is not limited to) the following elements:

- Working with Whitsunday Marketing and Development Ltd, Bowen Collinsville Enterprise, Bowen B.E.S.T. Employment Services and Training, WRC and IRC, local businesses, Queensland Government's Office of Advanced Manufacturing and the ICN Gateway in communicating with local businesses to provide integrated and sustainable local business participation opportunities

- Preference to suppliers of regional and Australian-manufactured equipment, that is competitively priced and complies with the required standards and specifications.

Initiatives to build capacity for local and regional businesses

In order to support contractors to develop and abide by the Local Content Strategy, Adani will work with the contractors to ensure that they are aware of the reasons and requirements for a local procurement program.

To encourage local and regional businesses to work with the NGBR Project, Adani will engage/partner with key regional stakeholders such as Bowen Collinsville Enterprise, Whitsunday Marketing and Development Ltd, Moranbah Traders Association and Economic Development at IRC and WRC to identify gaps and opportunities for capacity building for local and regional businesses in the area for tendering and contract requirements and support appropriate skills development programs in the region.

The Local Content Strategy will integrate with the Recruitment and Training Program (as outlined later in this section) to provide businesses with appropriate support to participate in the NGBR Project.

Local employment initiatives

As per the NGBR Project's Local Content Strategy, preference for workforce sourcing will be given in the hierarchy of local, regional, state and national recruitment for direct, as well as contractor employment opportunities. The contractors will be responsible for the recruitment of the required workforce and ensure relevant organisations such as DETE, IRC, WRC, Whitsunday Industry Workforce Development, Whitsunday Marketing and Development Ltd, FIFO Coordinators at Cairns, Gold Coast and Wide Bay councils and other relevant organisations have access to workforce profile information. Contractors will provide notification of employment and business opportunities via the ICN Gateway and local and regional recruitment agencies such as STEPS Employment (people with disabilities), Collinsville; Neato Employment Services Collinsville and Bowen; TAFE Employment Services, Bowen; and Bowen B.E.S.T Employment Services and Training (also a registered training organisation for a range of courses relevant to construction and mining skills).

Indigenous participation

Indigenous participation in the NGBR Project is important to Adani. Adani will provide and will require its contractors to provide employment opportunities for Indigenous persons, with particular focus on the local Indigenous populations.

In an endeavour to afford Indigenous persons opportunities to meet their cultural needs in relation to employment, Adani and its contractors will support and implement initiatives (specifically attraction, selection, training and development activities) to assist Indigenous persons to be employed by Adani and contractors.

Adani will continue to engage with the Jangga, Birri and Juru Peoples through the cultural heritage management plan (CHMP) and native title processes and will continue to work with traditional owners to further develop and agree upon Indigenous business and employment opportunities.

Adani has commenced engagement with Department of Aboriginal and Torres Strait Islander and Multicultural Affairs (DATSIMA) to develop an appropriate Indigenous Participation Plan, including specific participation and training initiatives and performance indicators for contractors.

Recruitment and training program

The NGBR Project's preference will be to engage 20 per cent of the construction and the entire operation workforce from the regional study area (refer to workforce profile in Section 16.4), with a combination of some workers already residing in Bowen and some workers who may choose to relocate to Bowen.

Adani is committed to the development, training and employment of apprentices/trainees on the Project, where appropriate. Adani will support skills and up-skilling development of its workforce and is strongly encouraging its contractors to actively support apprentice/trainee development, training and employment through the placement of appropriate number of apprentices and trainees on the work site, subject to associated regulatory and associated restrictions.

Adani will engage with regional training providers, including but not limited to Barrier Reef TAFE and Bowen B.E.S.T. Employment Services and Training to offer appropriate training and apprenticeship programs. Relevant training for heavy diesel is currently offered at the Barrier Reef TAFE in Townsville and some supporting industry skills development programs are already offered at the Barrier Reef TAFE in Bowen. Adani will tap into these existing programs as appropriate to the NGBR Project.

Adani will continue to work collaboratively with government agencies and training organisations such as Skills Queensland, Department of Education, Training and Employment (DETE), Whitsunday Marketing and Development Ltd, WRC, IRC, DSDIP, DATSIMA and engage with FIFO Coordinators at Cairns, Gold Coast and Wide Bay councils and Skills DMC to develop and finalise the recruitment, education and training program. This will include consideration of maximising employment opportunities and improving skill levels in the community.

For sustainability of the region's community and economy Adani will also explore supporting skills development in other industrial sectors relevant to the regional study area.

Monitoring framework

The following Table 16-28 provides a summary of the mitigation and management strategies and key performance indicators for monitoring impacts and corresponding management strategies for local and regional business development and employment opportunities.

Table 16-28 Summary of local and regional business and employment management strategies

Mitigation and management strategies	Key performance indicators	Key stakeholders involved	Indicative timeframe
Develop a Local Content Strategy in accordance with the Queensland Resources Council's, Queensland Resources and Energy Sector Code of Practice for Local Content 2013 and associated	Developed and implemented all actions stated under the Local Content Strategy Contractual documentation reflects the conditions of the Local Content Strategy	Adani DSDIP QRC ICN WRC IRC Whitsunday Marketing and Development Ltd Bowen Collinsville	Pre-construction, construction and operation

Mitigation and management strategies	Key performance indicators	Key stakeholders involved	Indicative timeframe
Implementation Guidelines		Enterprise Office of Advance Manufacturing	
Develop local employment initiatives	Established linkages with local/regional recruitment agencies Implemented local employment initiative Contractual documentation reflects conditions of local employment	Adani Contractors B.E.S.T Bowen Employment Services	Pre-construction, construction and operation
Develop Indigenous employment initiatives	Implemented Indigenous employment initiatives Integration with Project's CHMP and native title processes Identified and established linkages with Indigenous employment and services providers Contractual documentation reflects conditions of Indigenous employment	Adani Contractors Jangga, Birri and Juru Peoples Indigenous employment agencies in the region DATSIMA	Pre-construction, construction and operation
Develop initiatives to build capacity for local and regional businesses	Established linkages with Whitsunday Marketing and Development Ltd and Bowen and Collinsville Enterprise Established online resources for businesses Implemented local and regional business initiative	Adani Contractors Whitsunday Marketing and Development Ltd Bowen and Collinsville Enterprise	Pre-construction, construction and operation
Develop a recruitment and training program to enhance local employment opportunities	Skills and training gaps identified in the region Engagement with training providers regarding local employment opportunities Implementation of targeted training program	Adani Contractors DETE Barrier Reef TAFE and other training providers WRC DSDIP DATSIMA Skills DMC	Pre-construction, construction and operation

16.6.2 Workforce management strategies

The workforce management strategy involves managing and upskilling of the workforce that is engaged on the NGBR Project. Adani's overall approach to workforce management is three-pronged as follows:

- Behaviour of the workforce on the job and in the accommodation facilities will be managed through a Code of Conduct and ongoing awareness raising activities. This will be applicable whilst travelling between the point of origin and the workplace and when in local and regional communities
- Worker health, safety and wellbeing will be addressed in the Workplace Health and Safety Management Plan
- A recruitment, education and training plan will be developed and implemented to maximise training and development opportunities and provide a sustainable skilled workforce.

As per the requirements and advice from DETE, Adani will develop a Workforce Management Plan (WMP) for the NGBR Project. The WMP will be applicable to Adani, as well as the contractors engaged for the NGBR Project. The WMP will include but not be limited to the following:

- Develop and periodically update key stakeholders such as DETE, QPS, QAS, WRC and IRC with details on project workforce numbers, project timing, rosters, and travel arrangements
- Opportunities for flexible and 14 days on and 7 days off rosters which are considered to be family friendly as oppose to the 21 days on and 7 days off rosters
- Equal employment opportunities on the NGBR Project
- A Workplace Health and Safety Management Plan will be developed, which will includ first aid, occupational therapy services for workforce on site and extension of counselling services for workers in camps
- A workers Code of Conduct will be applicable to all construction and operation employees, contractors, subcontractors and consultants working on the NGBR Project, at all times when on duty, travelling for work and/or attending work related functions. The Code of Conduct will be linked to employee contract conditions and will require employees to:
  - Comply with relevant State and Commonwealth law
  - Abstain from any illegal drug use
  - Maintain behavioural standards at all times including the prohibition of alcohol and illicit drugs ('zero tolerance' for drug and alcohol abuse) whilst working and limiting its use at other times in a manner that is consistent with maintaining appropriate standards of behaviour. This will be monitored through mandatory drug and alcohol testing. Workforce behavioural standards will be incorporated into employment conditions. Clear consequences for workers not adhering to behavioural standards will be set out, including dismissal for serious non-conformances or repeated offences
  - Be respectful of the communities within which they work and visit and refrain from any behaviour which could be harmful and/or result in negative impacts on the communities in which they work

  - Use work vehicles appropriately and in accordance with the company's policies regarding transportation to and from the site
- Undertake induction and education programs which will include education and awareness on:
  - Code of Conduct to familiarise workers with all aspects of the standards of expected behaviour
  - Workplace Health and Safety Management Plan to encourage workers to access health services at early signs of illness, counselling services and fatigue management
  - Site-specific inductions – to familiarise workers with specific aspects of each site location, including fire safety, first-aid stations and emergency assembly areas.
- Programs that address needs of the workforce who may choose to move residences and/or families to Bowen or the nearby region. These programs will include workforce induction programs and integration and cohesion programs through increased support and partnership with WRC, IRC and local community organisations. This will be extended as part of Adani's commitment to undertaking community and stakeholder engagement to identify potential opportunities in the NGBR Project regional study area
- Training and up-skilling – Adani will develop a training and recruitment program as detailed in Section 16.6.1.
- Indigenous participation – Indigenous participation will be encouraged and managed as detailed in Section 16.6.1.

Monitoring framework

The following Table 16-29 provides a summary of the mitigation strategies and key performance indicators for monitoring impacts and corresponding management strategies for workforce management.

Table 16-29 Summary of workforce management strategies

Mitigation and management measure	Key performance indicators	Key stakeholders involved	Indicative timeframe
Develop a WMP in consultation with DETE	WMP developed Ongoing implementation of WMP	Adani DETE Contractors Workforce and families	Pre-construction, construction and operation

16.6.3 Land management

The NGBR Project final rail corridor has been designed to minimise impacts on affected properties where possible, and avoid fragmentation of properties resulting in the creation of non-productive portions. Additionally, the NGBR Project final rail corridor has been designed to avoid homesteads and associated infrastructure as far as practicable.

Consultation with landholders is ongoing with regard to the development of design measures aimed at minimising impacts on landholders. Agreements are in place with most landholders regarding access for planning and investigative works. Adani will continue to adopt and enforce

appropriate land access protocols for all their staff including contractors and consultants. These protocols include, but are not limited to:

- Process and timeframes for permissions to enter the property to access different parts of the property
- Speed of vehicles on private properties
- Protocols relating to weed and seed management.

Adani is committed to resolving land access and land acquisition through an amicable negotiation process. A statutory process exists for this under the *Land Act 1994* and, depending on the mechanism for establishing the corridor, the *State Development and Public Works Organisation Act 1971* or *Sustainable Planning Act 2009.* As part of these negotiations the following will take place:

- Landholders will be able to retain independent legal advisors and land valuation specialist
- Landholders will be consulted about the location and design for stock and vehicle/equipment crossings of the final rail corridor and ancillary infrastructure (both temporary and permanent) based on minimising impacts on access to bisected properties whilst taking into account engineering design constraints
- A combination of in-kind and/or monetary compensation for land value and value of affected improvements will be agreed. Where the rail alignment renders portions of a property unfeasible for the current use, the compensation agreement will reflect this and will include measures to retain productivity wherever practicable
- Temporary access requirements and location of any relevant ancillary infrastructure and associated compensation will be agreed
- Any access restrictions or critical timing issues will be resolved

Ongoing management aspects during operation of the rail line will be documented. These matters will be covered on a case by case basis, and may include access for maintenance, management of various potential environmental impacts, agreements regarding purchase of water and minimisation of fire risk.

Monitoring framework

The following Table 16-30 provides a summary of the mitigation strategies and key performance indicators for monitoring impacts and corresponding management strategies for landholder impacts.

Table 16-30 Summary of landholder agreement and land access management strategies

Mitigation and management strategies	Key performance indicators	Key stakeholders involved	Indicative timeframe
Develop a Land Access Protocol in consultation with the landholders	Land access protocol in place for all project related activities on properties	Adani Contractors Landholders	Pre-construction and construction
Engage in fair land negotiation processes	Stakeholders are satisfied in land negotiation processes	Adani Landholders	Pre-construction

16.6.4 Housing and accommodation impact management strategies

It is estimated that the construction workforce of the NGBR Project will be 1,700 in the second year of construction (2015) of which it is anticipated that 80 per cent will be FIFO and 20 per cent will be DIDO/BIBO who will be existing residents of the regional study area. It is proposed that the FIFO construction workforce will be housed in five construction camps located along the rail corridor. However, due to large travel distances, particularly in the central to southern sections of the final rail corridor, the local workforce may be required to reside in the temporary construction camps when on roster as fatigue management requirements will most likely prevent long drives at either end of a shift. Adani will work closely with the WRC and IRC to identify appropriate locations of these camps.

It is anticipated that the operation workforce will be approximately 254 workers in 2016 and will peak at 369 workers in 2026. The operation workforce will mainly comprise of existing residents of Bowen, with a small number anticipated to relocate from elsewhere. Consultations with WRC determined that current housing availability and future development plans for Bowen reflect that the gradual increase in the NGBR Project's operation workforce potentially moving into town can be accommodated within the existing Bowen housing market.

To measure and manage any potential impacts on housing during operation, Adani will implement the following management measures:

- Monitor regional housing conditions through consultations with key housing stakeholders in Bowen
- Implement an approach to accommodation management that is transparent and flexible to changing housing conditions during the NGBR Project planning phase through to the commencement of construction.

Monitoring framework

Table 16-31 provides a summary of the mitigation strategies and key performance indicators for monitoring impacts and corresponding management strategies for housing and accommodation impacts.

Table 16-31 Summary of housing and accommodation management strategies

Mitigation and management strategies	Key performance indicators	Key stakeholders involved	Indicative timeframe
Monitor regional housing conditions through consultations with key housing stakeholders in Bowen	Number of project staff residing in open housing market in regional area Engagement with regional community networks and key stakeholders Project accommodation requirement details provided to key stakeholders	Adani WRC	Construction and operation
Implement an approach to accommodation management that is transparent and flexible to changing housing conditions between start of construction and start of operation.	Engagement with regional community networks and key stakeholders Project accommodation requirement details provided to key stakeholders	Adani WRC	Construction and operation

16.6.5 Community health and wellbeing management strategies

Workforce integration and cohesion program

To ensure integration of the workforce that will relocate to Bowen Adani will offer induction to their workforce. Adani will seek to partner with WRC and local community organisations to offer appropriate support to new residents, including cultural support services for those relocating from overseas (if required).

Management of impacts on health and emergency services

An Emergency Management Plan has been prepared for the construction and operation phase of the NGBR Project (refer Volume 2 Appendix P Environmental management plan framework). This plan has been prepared as part of the hazard and risk assessment undertaken for the NGBR Project EIS. The plan was developed under appropriate regulations (refer Volume 1 Chapter 18 Hazard, risk, health and safety) and in close consultations with QFRS, QPS and QAS.

Where possible Adani will extend its overall commitments, made to manage impacts on emergency services to the NGBR Project regional study area, these will include, further investigation into resourcing requirements, including vehicles and staff, through liaising with

QPS, Queensland Health, QFRS and QAS at a State and local level. This process will be supported through the formation of an Emergency Services Consultative Committee.

Overall, the NGBR Project is not expected to significantly increase the population of the communities located closest to the NGBR Project due to small operation workforce and accommodation of construction workforce in workers camps along the rail corridor. Although some population growth may occur in Bowen as a result of operation workforce and increased economic activity that the NGBR Project will bring, it is anticipated that this will be in line with OESR population projections. As a result, the construction and operation activities of the NGBR Project are not expected to exacerbate existing issues in relation to social services and infrastructure. However, should the population increase significantly as a result of the NGBR Project, Adani is committed to continuing to work with the WRC and service providers to monitor population and demographic changes in Bowen and develop responses, as required, to address any emerging social issues.

Workforce health and wellbeing will be managed under the WMP, including provisions of counselling and support services will be available at the accommodation facilities during construction. This further reduces the potential for the NGBR Project to impact upon service providers in the key population centres around in the regional study area.

Traffic safety

Issues related to traffic safety will be addressed through the Traffic Management Plan developed in the Project EIS and will be implemented under the NGBR Project EMP (refer Volume 2 Appendix P Environmental management plan framework). Therefore, detailed traffic safety initiatives are not discussed in this chapter, however success of the implementation of the Traffic Management Plan will be monitored through the grievance management procedure.

Monitoring framework

The following Table 16-32 provides a summary of the mitigation strategies and key performance indicators for monitoring impacts and corresponding management strategies for community health and wellbeing impacts.

Table 16-32 Summary of community health and wellbeing management strategies

Mitigation and management strategies	Key performance indicators	Key stakeholders involved	Indicative timeframe
Develop a Workforce Integration and Cohesion Program	Developed appropriate initiatives as part of WMP Engaged with WRC and other service providers to develop elements of this program	Adani WRC Other service providers (to be identified)	Construction and operation
Monitor success of the implementation of the various amenity management plans and Traffic Management Plan	Grievance Management Procedure in place Complaints regarding amenity impacts are recorded and acted upon within a stipulated	Adani Community Landholders	Construction and operation

Mitigation and management strategies	Key performance indicators	Key stakeholders involved	Indicative timeframe
through the Grievance Management Procedure which will be managed by the stakeholder engagement team	timeframes		
Engage with emergency service providers to for input into the Emergency Management Plan and monitor Project's impact on their services	Engaged with emergency service providers Developed and implemented Emergency Management Plan Additional indicators to be agreed during consultation	Adani QFRS QPS QAS	Pre-construction

16.6.6 Monitoring program

To ensure the social impact identification and management is updated as the NGBR Project progresses, a monitoring and reporting mechanism is critical. A monitoring program will be developed in consultation with the key stakeholders during the finalisation of the impact management strategies and stakeholder roles and responsibilities. In addition to the information provided in each impact mitigation section above (impacts, management strategies, key performance indicators, key stakeholders involved), the monitoring program will include specific targets and outcomes and timing and frequency of reporting.

For the NGBR Project Adani will establish its monitoring mechanism through memberships of existing and functional community forums in the regional study area, ongoing consultations key with regional stakeholders and landholder communication and feedback mechanisms.

Overall reporting to the CGs Office on social impacts and management will be carried out as per the Social Impact Assessment Guidelines (July, 2013), which stipulates monitoring be undertaken on an annual basis during construction and during the first two years of operation, or as otherwise stipulated by the CGs office.

16.6.7 Stakeholder engagement strategy

Engagement with stakeholders is an important component to managing and monitoring the potential social impacts and opportunities of the NGBR Project. Stakeholder consultation will continue throughout the life of the NGBR Project. A stakeholder engagement plan for the NGBR Project will be developed within Adani's overall stakeholder engagement strategy

Goal

The main aim of the stakeholder engagement strategy is to assist Adani to establish and maintain its social licence to operate where the community respects and trusts Adani through:

- Building awareness, understanding, and acceptance of the NGBR Project by community, stakeholders
- Establishing and maintaining community partnerships that benefit a range of stakeholders
- Enhancing Adani's understanding of stakeholder needs, issues and expectations

Objectives

- Identify and inform stakeholders about the project's scope, timing and potential impacts and benefits
- Engage stakeholders through a variety of channels and capture their concerns and opinions about the NGBR Project to inform the project team's decision making process
- Ensure early identification of potential stakeholder issues and implement timely and appropriate mitigation strategies
- Create awareness and acceptance of the project with stakeholders
- Manage land access and acquisition processes to minimise project delays

Key principles of engagement

The key principles of the stakeholder engagement strategy will be:

- To be accessible to stakeholders and the community in an ongoing capacity
- To be responsive and provide information in a timely manner
- To be open and honest in order to develop trust and respect.

Communication tools and techniques

A range of communication tools and techniques will be considered to establish and maintain stakeholder relationships and meaningful engagement throughout the life of the NGBR Project. These tools and techniques will include:

- Registered memberships - Adani will take membership of appropriate regional resource industry forums to share project information and monitor project impacts
- Stakeholder meetings and agency briefings – Face-to-face stakeholder meetings and agency briefings will be conducted as required
- Notification letters – A range of notification letters will be prepared and distributed to stakeholders as required throughout the Project
- Email updates – Updates on the NGBR Project's key milestones will be regularly emailed to key stakeholders
- Records of contact – All staff will be required to complete a record of contact when meeting with or speaking to a stakeholder
- Protocols documents – Any protocol documents such as Workers Code of Conduct, Land Access protocol will be put in place
- Stakeholder database – A consultation database will be maintained for the NGBR Project
- Project enquiry line – A 1800 4 ADANI* (1800 423 264) number has been established for the duration of the NGBR Project
- Email enquiry address – ngbr@adani.com email enquiry address has been established for the duration of the NGBR Project
- Public displays – Public displays will be conducted as required
- Presentations – Presentations will be provided to a range of key stakeholder groups at key milestones throughout the NGBR Project, and on request when suitable

- Newsletters – NGBR Project newsletters will be developed to provide project updates, upcoming events and other related matters as required
- Website and text updates – NGBR Project updates and reports will be included on Adani's website and when necessary text messages will be used to communicate with key stakeholders
- Public notices – Public notices will be developed at key milestones
- Frequently Asked Questions (FAQs) – An FAQ document will be prepared and uploaded to the website

Grievance management and dispute resolution mechanism

The NGBR Project will follow Adani's overall grievance management and dispute resolution mechanism which provides an active response to community and stakeholder concerns about project impacts. A dispute resolution mechanism will be aligned with organisational processes and will include:

- A dedicated pathway and process for handling grievances
- The establishment and publication of various communication channels such as 1800 number, project email address and emergency contact numbers
- An assigned team to be the first port of call to manage and co-ordinate appropriate responses
- Relevant policies and procedures dedicated to or associated with handling community grievances will be developed and implemented, including procedures for response time, reviewing issues for escalation
- Maintenance of a data base to record any community grievances and project responses
- Making available appropriate resources for handling grievances.

Stakeholder engagement team

Adani's stakeholder engagement team will be responsible for developing and implementing a Stakeholder Engagement Strategy including required policies and procedures. It will be the responsibility of this team to co-ordinate responses for any grievances that may be registered with the project. The team will have presence in the corporate office in Brisbane and in the Galilee Basin Region, with its team members consulting with various stakeholders within the region on a regular basis, through attendance at regional forums and stakeholder meetings as required.

16.6.1 Summary of mitigation and management strategies

Table 16-33 summarises the key impact categories, associated mitigation and management strategies and indicative timeframe of implementation. This section only lists the key management strategies, for details on what will be included under each of the management strategies refer to Sections 16.6.1 to 16.6.6.

Table 16-33 Mitigation and management strategies

Project phase	Mitigation and management strategies
Local and regional business and employment strategies	
Pre-construction, construction and operation	Develop a Local Content Strategy in accordance with the Queensland Resources Council's, Queensland Resources and Energy Sector Code of Practice for Local Content 2013 and associated Implementation Guidelines
Pre-construction, construction and operation	Develop local employment initiatives
Pre-construction, construction and operation	Develop and implement Indigenous employment initiatives
Pre-construction, construction and operation	Development and implement initiatives to build capacity for local and regional businesses
Pre-construction, construction and operation	Develop recruitment and training program to enhance local employment opportunities
Workforce management strategies	
Pre-construction, construction and operation	Develop a WMP in consultation with (DETE),
Landholder impact management strategies	
Pre-construction and construction	Continue to implement, manage and monitor the existing Land Access Protocol in consultation with landholders
Pre-construction	Engage in fair and reasonable land acquisition negotiation processes
Housing and accommodation impact management strategies	
Construction and operation	Monitor regional housing conditions through consultations with key housing stakeholders in Bowen and Collinsville
Construction and operation	Implement an approach to accommodation management that is transparent and flexible to changing housing conditions between now and when the Project commences.
Community health and wellbeing management strategies	
Construction and operation	Develop a Workforce Integration and Cohesion Program
Construction and operation	Monitor success of the implementation of the various amenity management plans and Traffic Management Plan through the Grievance Management Procedure which will be managed by the stakeholder engagement team
Pre-construction	Engage with emergency service providers for input into the Emergency Management Plan and monitor Project's impact on their services

16.7 Residual impacts

Table 16-34 summarises the potential social impacts arising from the NGBR Project and reassess their significance rating against the proposed mitigation and management strategies to derive the expected residual impacts.

Table 16-34 Expected residual social impacts

Impact	Project Phase	Nature of Impact	Impact Significance	Mitigation Measures	Expected Residual Impact Significance
Local and regional business and employment strategies					
Opportunities for local and regional businesses in Bowen, Collinsville and Moranbah to supply goods and services to the project	Pre-construction, construction and operation	Positive	**High**	Develop a Local Content Strategy in accordance with the Queensland Resources Council's, Queensland Resources and Energy Sector Code of Practice for Local Content 2013 and associated Implementation Guidelines	**High**
Increased employment opportunities available for local and regional workforce	Pre-construction, construction and operation	Positive	**High**	Develop local employment initiatives. Develop recruitment and training program to enhance local employment opportunities	**High**
Providing employment and training opportunities for Indigenous people	Pre-construction, construction and operation	Positive	**Medium**	Develop and implement Indigenous employment initiatives	**High**
Indirect benefits from the project for regional, state and national areas	Pre-construction, construction and operation	Positive	**High**	Develop and implement initiatives to build capacity for local and regional businesses	**High**
Workforce management strategies					
Potential impacts on local communities from anti-social behaviour from non-resident, single male workforce	Pre-construction, construction and operation	Negative	**Low**	Develop a WMP in consultation with (DETE).	**Low**
Potential mental health issues for workforce due to isolation and separation from families and friends	Pre-construction, construction and operation	Negative	**Low**	Develop a WMP in consultation with (DETE).	**Low**

Impact	Project Phase	Nature of Impact	Impact Significance	Mitigation Measures	Expected Residual Impact Significance
Landholder impact management strategies					
Impacts on properties intersected by the NGBR Project - land fragmentation and access to and within the properties	Construction and operation	Negative	**High**	Development of occupational crossings and design features to minimise impacts of fragmentation. Continue to implement, manage and monitor the existing Land Access Protocol in consultation with landholders.	**Medium**
Changes to the natural environment from changes to overland flow paths with potential for increased ponding and flooding	Construction and operation	Negative	**High**	Development of design features to manage to manage impacts on surface water drainage flooding	**Medium**
Potential risk of spread of weeds and seeds	Construction and operation	Negative	**Medium**	Continue to implement, manage and monitor the existing Land Access Protocol in consultation with landholders	**Low**
Impacts on productivity and economic impacts – increase in workload for landholders, decrease in property values, decrease in viability of agricultural business due to disruption in cattle operations and increased time and resources required to manage cattle	Construction and operation	Negative	**High**	Landholder engagement will establish a regular channel of communication with the affected landholders and will assist in monitoring impacts on the landholders	**Medium**

Impact	Project Phase	Nature of Impact	Impact Significance	Mitigation Measures	Expected Residual Impact Significance
Changes to the living environment from increased noise and dust and reduced visual amenity and loss of privacy	Construction and operation	Negative	**Medium**	Landholder engagement will establish a regular channel of communication with the affected landholders and will assist in monitoring impacts on the landholders	**Low**
Anxiety and stress associated with land access and acquisition discussions and negotiations	Construction and operation	Negative	**Medium**	Landholder engagement for the impacted landholders will establish a regular channel of communication with the affected landholders and will assist in monitoring impacts on the landholders	**Low**
Increased fire risk along the rail corridor	Construction and operation	Negative	**Medium**	Adani will adopt current industry standards in relation to minimising fire risk from rail construction and operation included in the Emergency Management Plan developed in consultation with QFRS	**Low**
Housing and accommodation impact management strategies					
If there is existing shortage of housing availability, there is potential to further exacerbate shortages in housing supply and decrease housing affordability in Bowen. However given the current housing situation in Bowen there is sufficient availability of housing to accommodate the operation workforce	Construction and operation	Negative	**Low**	Monitor regional housing conditions through consultations with key housing stakeholders in Bowen and Collinsville. Implement an approach to accommodation management that is transparent and flexible to changing housing conditions between now and when the NGBR Project commences.	**Low**

Impact	Project Phase	Nature of Impact	Impact Significance	Mitigation Measures	Expected Residual Impact Significance
Community health and wellbeing management strategies					
Temporary increase in non-resident (FTE) population in WRC has the potential to place additional demand on regional services and facilities	Construction and operation	Negative	**Medium**	Develop a Workforce Integration and Cohesion Program	**Low**
Gradual increase in permanent population of Bowen	Operation	Positive	**Medium**	Develop a workforce Integration and Cohesion Program	**Low**
Changes to rural amenity and lifestyle of the landholders within the local study area from increased noise and dust and reduced visual amenity and loss of privacy	Construction and operation	Negative	**Medium**	Monitor success of the implementation of the various amenity management plans and Traffic Management Plan through the Grievance Management Procedure which will be managed by the stakeholder engagement team	**Low**
Changes to lifestyle and amenity of regional community	Construction and operation	Negative	**Low**	Monitor success of the implementation of the various amenity management plans and Traffic Management Plan through the Grievance Management Procedure which will be managed by the stakeholder engagement team	**Low**
Potential increased demand on regional and local health services, potentially exacerbate shortfalls in GP services, nursing staff and hospital emergency services	Construction and operation	Negative	**Medium**	Develop a workforce Integration and Cohesion Program	**Low**
Potential increased demand on regional emergency services including fire and rescue, police and ambulance	Construction and operation	Negative	**Medium**	Engage with emergency service providers for input into the Emergency Management Plan and monitor Project's impact on their services	**Low**

Impact	Project Phase	Nature of Impact	Impact Significance	Mitigation Measures	Expected Residual Impact Significance
Heightened safety risks to workers and the local community from increased project traffic, rail road crossings, cattle and rail crossings	Construction and operation	Negative	**High**	Issues related to traffic safety will be addressed through the Traffic Management Plan developed for the NGBR Project	**Medium**

16.8 Conclusion

As discussed in Section 16.5 the construction and operation of the NGBR Project has the potential to generate social and economic benefits as well as impact on the local and regional study areas. Through the implementation of the proposed management strategies in Section 16.6 it is anticipated that the potential benefits will be enhanced and the potential residual impacts on landholders, communities and social infrastructure services and facilities will be minimised, as identified in Section 16.6.1.

It is anticipated that with the implementation of the Local Content Strategy (as described in Section 16.6.1) the NGBR Project will leverage a range of economic and social benefits for the regional study area through increased employment and business development opportunities.

Potential adverse impacts on landholders will be minimised through the implementation of a range of NGBR Project design elements, for example occupational crossings and design features to minimise impacts of land fragmentation, land access protocols, negotiation and compensation mechanisms. Any low residual impacts will be monitored and addressed through appropriate landholder engagement and impact monitoring mechanisms.

It is acknowledged that during construction there may potentially be minimal residual impacts from workers in workers camps and on some social infrastructure services such as health. No residual impacts have been predicted for housing and accommodation.