10 ECONOMIC IMPACT ASSESSMENT

10.1 INTRODUCTION

This chapter describes the impacts on regional, state and national economies expected from the Queensland Curtis LNG (QCLNG) Project. These economic impacts are described in response to the Terms of Reference (ToR) set down for this Environmental Impact Statement (EIS) by the Queensland Coordinator-General.

The Coordinator-General's ToR require the economic impact assessment to describe the existing environment, assess identified and associated economic impacts and present appropriate mitigation strategies. Specifically, the ToR require QGC to assess:

- the relative significance of the Project in the local and regional economic context
- the extent to which local and Australian goods and services will be used
- the short- and long-term beneficial (e.g. job creation) and adverse (e.g. competition with local small business) impacts that are likely to result from the Project
- an indication of the occupational skill groups required by the Project and potential skill shortages anticipated
- the potential need for skills training in the new LNG industry, including maritime handling skills
- the need for any additional infrastructure provision by government to support the Project
- implications for future development in the local region (including constraints on surrounding land uses and existing industry)
- the potential impact of the Project on the domestic gas market and domestic gas prices, including the ability of the power generation sector to meet government emissions targets and gas-power targets.

10.1.1 Methodology

10.1.1.1 Modelling

Economic impacts of the QCLNG Project on regional, state and national economies were assessed by applying a computational general equilibrium (CGE) model, a commonly-used tool for calculating demand and economic activity.

This approach is well suited to a project of this size and scale as it depicts more realistic market dynamics than input-output analysis, another commonly used model. In particular, CGE modelling can capture price impacts by accounting for competition for constrained resources and for labour mobility. Essentially, this modelling recognises that some resources (e.g. labour) will be "drawn" to the Project from other sectors of the economy, potentially resulting

in a decline in production, possibly temporarily, in the industry from which the resources are drawn. It also reflects that a project of significant scale may change the fundamental structure and purchasing patterns of an economy. CGE modelling also takes into account the extent to which supplies and services for construction and operational activities would be sourced locally or regionally.

The impacts are examined in terms of:

- output
- value-added production
- incomes
- employment.

10.1.1.2 Approach

The economic assessment was informed through analysis of baseline information (predominantly Australian Bureau of Statistics data), economic impact modelling (CGE modelling using the "Tasman Global Model"), consultation with key stakeholders and the application of professional opinion and experience. It provides critical analysis and assessment of the economic impacts of the development in terms of:

- significance to the regional and state economies
- impacts to state and domestic balance of trade
- impacts to the domestic gas market
- impacts to the regional and state labour market
- impacts to business and industry
- impacts to government revenue and expenditure
- housing market impacts
- impacts on surrounding land uses.

The impact assessment includes the following steps:

- consultation with business, industry and key industry organisations in the primary study areas and other surrounding areas to identify existing activities and potential economic impacts, including:
  - discussions with business, industry and industry organisation representatives
  - analysis of business community input through other communication processes
- reference to the existing or previous condition of the economic environment
- analysis of the potential impacts of project elements. This includes interpretation of the findings of the economic impact modelling in the context of the regional and state economies, as well as analysis of other,

non-quantified changes to the economic environment

- evaluation of the significance of project impacts and benefits in relation to economic resources.

10.1.1.3 Timeframe

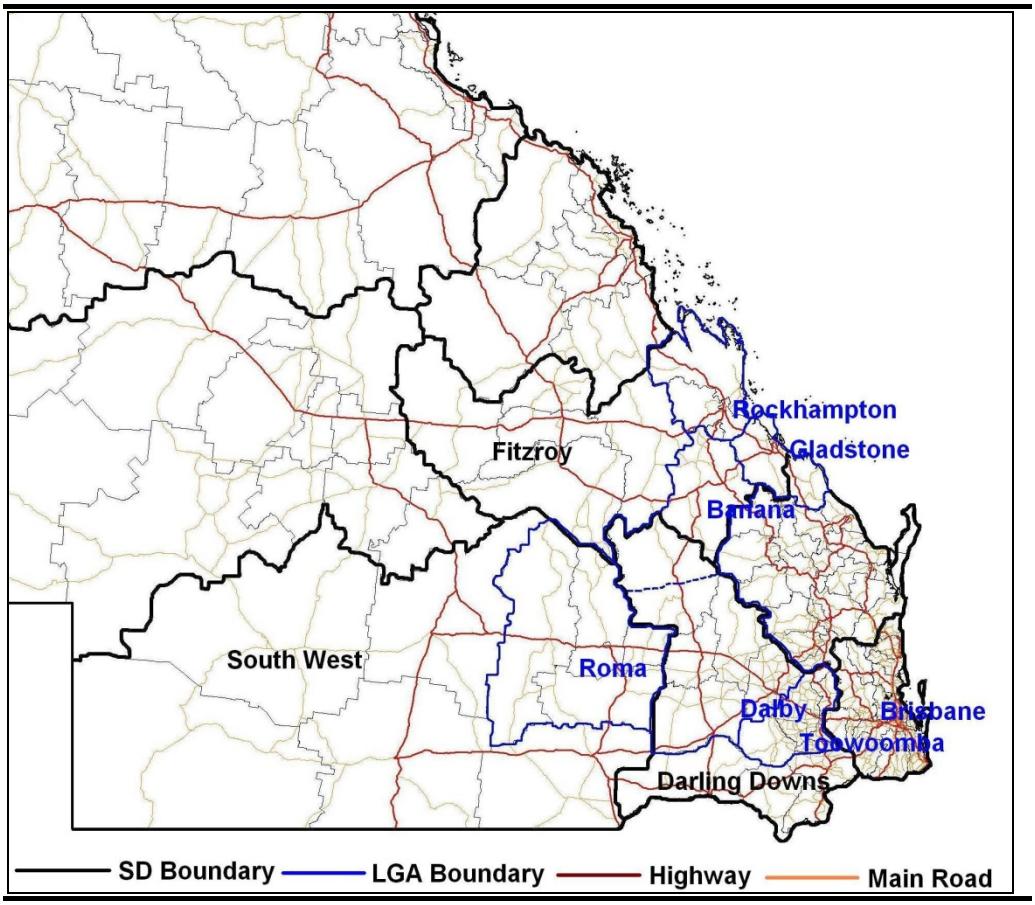
The economic impact assessment for the QCLNG Project considers two distinct periods, representing the primary construction phase and commercial operations. Construction is considered to occur from 2010 to 2013 and operation from 2014 to 2021. This timeframe (to 2021) has been applied for the purpose of ensuring the reliability of the data. Beyond this period the data is less reliably predictable. Project life is at least 20 years for each LNG processing unit, or "train". Also, the operational stage of the Project will involve considerable capital expenditure as the development of the Gas Field Component will continue in 2014 and afterwards due to the ongoing nature of coal seam gas (CSG) exploration and production. Therefore, economic impacts and benefits will extend well beyond 2021.

10.1.2 Project Study Area

The proposed Project extends from CSG extraction and processing operations in the Surat Basin of southern Queensland to a LNG processing plant and export facility located on Curtis Island in the Gladstone area. This represents the study area for this Project and comprises the regions that are expected to be directly impacted by the construction and operation of the Project.

10.1.2.1 Catchments

Figure 8.10.1 Local and Regional Catchments



Source: Australian Bureau of Statistics (2003), AEC*group.*

Australian Bureau of Statistics (ABS) Divisions

The study area for the QCLNG Project spreads across parts of three statistical divisions (SDs), or regions, in Queensland:

- Darling Downs, corresponding with the Dalby and Toowoomba regions
- Fitzroy, corresponding with the Gladstone, Rockhampton and Banana Shire regions
- South West, corresponding with the Roma region and several western Shires.

The Project's activities in the South West statistical division are minimal. Accordingly, impacts from the Project in this division were insignificant and not modelled.

Queensland

Given its size and scale, the Project will have an impact throughout Queensland. These impacts are examined in the economic impact assessment.

Australia

At a national level, the Project will have an impact on gross domestic product (GDP), tax revenue and balance of payments. These national impacts are examined in the economic impact assessment.

10.1.2.2 Existing Land Uses

An overview of existing land uses within the respective statistical divisions is provided below. A more detailed outline of key industries and land activities (e.g. agricultural activity) is outlined in *Volume 8 Chapters 4, 5* and *6*.

- Gas Field Component area. The Project's CSG fields occupy primarily agricultural and grazing land and some bushland. The majority of the land within the CSG tenement boundaries (approximately 65 per cent) is classified Class C Pasture Land (i.e. not Good Quality Agricultural Land – GQAL). The remainder is composed of GQAL Class A (18 per cent) and Class B (17 per cent), suitable for cropping and grazing. In total the Project will require approximately 7,000 hectares for the development of CSG wells and associated infrastructure, equivalent to 0.1 per cent of the agricultural land in the Darling Downs region.
- Pipeline Component area. A 380 km, underground Export Pipeline will link the CSG fields in the Surat Basin with the LNG Facility in Gladstone. The majority of the areas through which the pipeline will pass are rural, with extensive cattle grazing, arable farming and other mining and energy-based land uses.
- LNG Facility area. The proposed location for the LNG Facility is the south-west corner of Curtis Island. In 2008, Queensland's Coordinator-General expanded the Gladstone State Development Area (GSDA) by adding 1,563 hectares of land at the south of Curtis Island. This area will support industrial development in the region with a focus on LNG processing operations and export wharf facilities. The land has previously sustained a variety of uses, including grazing. The proposed QCLNG Project LNG Facility site will occupy approximately 270 hectares of the GSDA at a location known as North China Bay.

10.2 ECONOMIC STRUCTURE

10.2.1 Overview

The Queensland economy accounted for almost 19 per cent of gross domestic product (GDP) in Australia in 2006-07. The Darling Downs and Fitzroy regions accounted for approximately 6.8 per cent and 5.7 per cent respectively of gross state product (GSP) in 2006-07. When combined, the regions represented approximately 2.2 per cent of national GDP. Queensland has for several years experienced stronger economic growth than has the rest of Australia, reflecting strong population growth, high levels of public investment to support the population and the state's exposure to the resources sector.

The strength of resource exports has allowed Queensland to maintain a trade

surplus over the past few years, reaching $4.3 billion in 2007-08. This contrasts with a trade deficit for Australia of $21.1 billion. Coal is Queensland's largest export and much of this is exported to Japan and emerging economies in Asia. The value of coal exports has been exceptionally strong in the past few years due to the industrialisation of China and other emerging economies. This has in turn produced strong increases in export prices for thermal and coking coal. Recently, Queensland's exports have declined in conjunction with softer economic growth for the state's main trading partners in Asia.

LNG exports from the proposed QCLNG Project would make a substantial contribution to Queensland's exports of approximately $4 billion based on export capacity of 7-7.5 million tonnes per annum (mtpa) and an oil price in the range of US$50 to US$70. LNG exports would also reduce the state's reliance on coal for export earnings and royalty revenues.

10.2.2 Key Industries

Growth in both the Darling Downs and Fitzroy regions has been solid in recent years through an exposure to the resources sector.

The entire study area includes extensive agricultural and pastoral land. Agriculture was the largest industry in the Darling Downs by value, contributing almost $1.2 billion to GRP in 2006-07, or 24.6 per cent of the state's agricultural production. The Fitzroy region also accounts for a significant proportion, equivalent to 7.6 per cent or $363 million in GRP, of the state's agricultural production. These regions produce a diverse range of agricultural products but the most valuable are livestock (particularly meat and cattle) and crops such as wheat and sorghum.

For the Darling Downs, mining, in value terms, was the second largest industry in the region in 2006-07 with a contribution to gross regional product (GRP) of approximately $1 billion, behind agriculture (at $1.2 billion contribution to GRP). The Darling Downs region produces much of the state's CSG and has considerable reserves of thermal coal.

Mining is the largest industry in the Fitzroy region, contributing approximately $4 billion to GRP in 2006-07. Coal is the main commodity. The Fitzroy region is also indirectly exposed to the resources sector with a considerable amount of manufacturing focused on refining raw materials from the mining industry. Manufacturing was the second largest industry in the Fitzroy region in 2006-07, contributing approximately $1.4 billion to GRP.

The study area for the QCLNG Project includes a number of coal-fired and gas-fired power stations. These are based on the substantial thermal coal reserves in the Darling Downs and Fitzroy regions.

Gladstone is the base for a number of commercial fishing operations. However, the industry is a modest employer, employing only 86 people in 2006, of which 63 lived in Gladstone. There is a food manufacturing industry connected to agriculture in both regions.

10.2.3 Existing Infrastructure

Some of the infrastructure required for the development of the Project is already in place throughout the study area.

The Darling Downs region has much of the infrastructure needed to accommodate industrial development, including several large power stations.

Gladstone, in the Fitzroy region, is an established hub for heavy industry and the handling of bulk commodities, although dredging of the port is required. The Port of Gladstone is now one of Queensland's largest ports following strong growth in coal exports over the past few years. Coal exports accounted for almost 90 per cent of exports from the port in 2007-08. The site for the proposed LNG Facility on Curtis Island has limited road, water and sewerage and telecommunications infrastructure.

10.2.4 Employment and Wages

An employment breakdown by industry for the Darling Downs and Fitzroy regions largely reflects the industrial structure of the two economies:

- In the Darling Downs region, the "agriculture, forestry and fishing" industry was the largest employer, accounting for 12.5 per cent of total employment in the region. (Note "agriculture, forestry and fishing" is an industry category under the Australian and New Zealand Standard Industry classification.)
- In the Fitzroy region the largest employers in 2006 were the retail trade industry (14.3 per cent of employment), manufacturing including minerals processing (11.4 per cent) and construction (9.4 per cent). Employment in the mining industry represented only 6.9 per cent of total employment, reflecting its capital intensive nature.
- In the Darling Downs, managers and labourers were more common occupations in 2006 than for Queensland as a whole. This is likely to reflect the employment of farm managers and labourers, given the significance of agriculture to the regional economy. In 2006, the Fitzroy region employed a higher proportion of technicians and trades workers and labourers than the Queensland average. This is a reflection of heavy industry within the region.
- The labour market in both regions has tightened in the past few years, evidenced by falling unemployment rates. In the Darling Downs, the participation rate (60.9 per cent) in 2006 was below the state average of 61.8 per cent, indicating some scope to fill QCLNG Project positions from the local population, given the training and capacity building initiatives outlined in *Chapters 4, 6, 7* and *8*. However, the unemployment rate in the Darling Downs was below the state average in 2006 at 4.5 per cent, and some labour from outside the region will be required.
- In the Fitzroy region, the participation rate (63.3 per cent) was higher than the state average in 2006 and the unemployment rate (4.5 per cent) lower than the state average (4.7 per cent). The 2009 downturn in mining and industrial development projects in the region may have increased labour

availability, but this may alter by 2010.

- Reflecting the relatively skilled workforce in the Fitzroy region and tightness of the labour market, average weekly incomes were higher in 2006 than the Queensland average. In contrast, average weekly incomes were lower in the Darling Downs region than the state average.

10.2.5 Housing and Accommodation

New housing supply has failed to keep pace with population growth in the Darling Downs and Fitzroy regions over the past few years. Between 2001 and 2006, growth in residential housing stock was below population growth in both regions.

This has contributed in both regions to strong growth in house prices, rents and housing stress (as defined in previous chapters in this volume). Approximately 40.7 per cent of low-income households in the Darling Downs region and 32 per cent of low-income households in Fitzroy were experiencing mortgage stress in 2006. Similarly, rental stress was experienced by 53.1 per cent and 52.8 per cent of low-income renting households in the Darling Downs and Fitzroy regions respectively in 2006. While this may appear high, mortgage and rental stress is more common across Queensland as a whole than for these two regions. Note that official interest rates were 6.25 per cent in December 2006, increased to 7.25 per cent in mid 2008, and dropped to 3 per cent in May 2009, which may have reduced housing stress in the last few months for some households in the region.

Short-term accommodation in the area of the proposed Gas Field Component is also in tight supply, with the Dalby region recording an occupancy rate of 76.9 per cent in 2007-08, substantially higher than for Queensland as a whole (62.5 per cent). Short-term accommodation near the proposed LNG Facility was more readily available, with the average occupancy rate in the Gladstone LGA of 58.9 per cent much closer to the Queensland average in 2007-08. Nonetheless, there is anecdotal evidence that short-term accommodation can be difficult to obtain in the Gladstone area.

10.2.6 Major Projects

Numerous non-residential construction projects are under investigation for the study area. Major projects under study or committed for Gladstone include a number of LNG projects, port expansions, cement mills and smelters. Further detail is provided in *Chapter 6* of this volume. Skills shortages could be a risk for the Fitzroy region if several projects are undertaken at the same time.

Coal and electricity developments are under consideration in the area of the CSG fields. In the Dalby and Roma area, projects totaling approximately $2.5 billion are currently under study or construction. Further detail is provided in *Chapter 4*.

10.2.7 Regional Economic Development Initiatives

Queensland local governments have recently amalgamated. The newly-formed councils are identifying development initiatives. Initiatives outlined by the Gladstone Regional Council appear supportive of further industrial development. Similarly, a Surat Energy Action Plan, supportive of

CSG projects, is currently under development.

10.3 KEY FINDINGS

The QCLNG Project will represent a multi billion dollar capital injection during the primary construction phase (2010 to 2013) across the three key elements of the Project: Gas Field Component, Pipeline Component and LNG Component. It will generate substantial employment and "value-added" activity (generally equivalent to an increase in GSP) in regional economies. Approximately half the total capital expenditure associated with the Project will be sourced from within Australia, including 18.4 per cent from within the Darling Downs and Fitzroy regions.

10.3.1 Economic Impact

10.3.1.1 Economic Growth

Overview

Under CGE modelling, the QCLNG Project is estimated to stimulate an increase in Queensland GSP of approximately $32 billion through both the construction and operation phases between 2010 and 2021, or approximately $2.6 billion per annum on average. This is equivalent to an increase of approximately 1.3 per cent in total Queensland GSP when compared to 2006-07.

The QCLNG Project will stimulate broader economic, or "value-added", activity that will contribute to the state economy. This includes:

- approximately $2.4 billion in value-added activity in Queensland during the construction phase (2010 to 2013), equating to an annual average of $600 million in value-added activity
- approximately $29.5 billion in value-added activity in Queensland during the operations phase (2014 to 2021), equating to an annual average of $3.7 billion in value-added activity.

Regional economic impact

The Project is expected to deliver a significant increase in output for the Darling Downs and Fitzroy, particularly in the manufacturing and mining industries. In both regions, total output is on average expected to be higher for all other industries between 2010 and 2021, reflecting the flow-on benefits from the Project. The exception is agricultural production in the Darling Downs, which is expected to contract modestly, mainly as a result of competition for labour.

CGE modelling indicates that the total contribution to Darling Downs region gross regional product (GRP) from the QCLNG Project will be approximately $14.1 billion between 2010 and 2021. This equates to an annual average increment to GRP in the Darling Downs region of approximately $1.2 billion per annum, which is equivalent to an increase of approximately 11.1 per cent in total Darling Downs GRP when compared to 2006-07.

In the Fitzroy region, the QCLNG Project is estimated to provide a total increase in GRP of approximately $13.4 billion between 2010 and 2021, equating to approximately $1.1 billion per annum on average over the period. This is equivalent to an increase of approximately 7.7 per cent in total Fitzroy GRP when compared to 2006-07.

The impact of the QCLNG Project for regional and state economies during the construction and operation phases is summarised below.

Construction

- During construction (2010 to 2013), the QCLNG Project is estimated to generate:
- approximately $2.4 billion in value-added activity and 18,889 full time equivalent (FTE) employee years[1] in Queensland
- approximately $608 million in value-added activity and 5,440 FTE employee years in the Darling Downs region
- approximately $380 million in value-added activity and 4,770 FTE employee years in the Fitzroy region
- approximately $1.4 billion in value-added activity and 8,677 FTE employee years in the rest of Queensland.

Operation

During operation (2014 to 2021), the QCLNG Project is estimated to generate:

- approximately $29.6 billion in value-added activity and 40,749 FTE employee years in Queensland
- approximately $13.6 billion in value-added activity and 16,776 FTE employee years in the Darling Downs region
- approximately $12.8 billion in value-added activity and 10,560 FTE employee years in the Fitzroy region
- approximately $3 billion in value-added activity and 13,410 FTE employee years in the rest of Queensland.

10.3.1.2 Employment and wages

- The QCLNG Project is estimated to generate employment of approximately 60,000 full-time equivalent (FTE) years over a 12-year period from construction to steady-state production of a two processing unit, or “train”, project. This overall employment comprises:
- approximately 18,889 FTE employee years in Queensland during the construction phase (2010 to 2013), equating to an annual average of 4,722 FTE employee years
- approximately 40,749 FTE employee years in Queensland for the

1 Where 1 FTE employee is equivalent to 1 FTE employment position for one year.

eight year operation phase (2014 to 2021), equating to an annual average of 5,094 FTE employee years.

It is estimated that approximately 22,217 FTE employee years would be generated by the Project in the Darling Downs between 2010 and 2021 and 15,334 FTE employee years in the Fitzroy region. A further 22,087 FTE employee years is estimated to be generated throughout the rest of Queensland.

Associated with this increase in employment is an additional $953.2 million in wages and salaries between 2010 and 2021 in the Darling Downs, $697.1 million in the Fitzroy region and approximately $1 billion in the rest of Queensland.

It is estimated that during the construction phase (2010 to 2013) the Project will draw considerable labour from other sectors that have similar skill sets. Industries likely to be impacted include those with a relatively high proportion of occupational categories such as technicians and trade workers, labourers and managers. These industries are likely to include manufacturing, mining, agriculture, forestry and fishing, and transport and storage.

The additional demand for labour in a constrained market is likely to create pressures on wages and other input costs, potentially to the detriment of existing local businesses. Modelling suggests that these pressures could result in an appreciation averaging 3.7 per cent and 2.8 per cent per annum for real wages paid between 2010 and 2021 in the Darling Downs and Fitzroy regions respectively. If unemployment is high then an increase is less likely in wages. Small business, in particular, may be adversely impacted by increasing costs of labour and other inputs. The impact is likely to be most severe for industries in which margins are tighter and products more homogenous. Mitigation strategies including QGC's Local Content Strategy and training and recruitment initiatives are described in *Chapter 6* and *Chapter 8* of this volume.

10.3.1.3 Government Revenue

- The QCLNG Project is estimated to generate annual average royalty income for Queensland between $150 million and $330 million, depending on oil prices. Australian Government annual average tax income from the Project is estimated at between $600 million and $1.1 billion, depending on oil prices.
- It is also expected that GST revenues would increase as a result of the Project. Quantifying the additional revenue is complex due to allowable exemptions. However, based on an assumed effective tax rate of 4 per cent (accounting for exemptions) on additional output, annual GST revenues are estimated to increase by approximately $210 million per annum due to additional transactions as a result of the development.

Although GST has been notionally included in the Australian Government's share, GST revenues are redistributed to the states. In accordance with the Intergovernmental Agreement, the Australian Government administers GST on behalf of the states with GST revenue paid to the states (Australian Government, 2009). According to the 2008-09 budget, Queensland will receive approximately 19 per cent of GST revenue in 2008-09. On this basis, the Queensland Government could expect to receive approximately $40 million annually in GST payments resulting from the proposed QCLNG Project.

10.3.1.4 Domestic Gas Market

Modelling indicates that scenarios where the QCLNG Project proceeds, the uptake of gas for electricity generation is estimated to continue to grow to be around 30 per cent of Queensland electricity generation by 2020 (ACIL Tasman, 2009). This comfortably exceeds the government's current 13 per cent target as well as the outlined target for 2020 of 18 per cent.

A relatively mild increase in gas prices associated with the QCLNG Project may occur in the eastern Australian market, particularly in markets closest to the LNG operations The higher prices are estimated to result in a slightly lower level of Queensland gas consumption when compared to the "without project" scenario. Most of any reduction in gas consumption in Queensland is estimated to occur in the industrial sector, where loads are particularly price sensitive and import substitution is an option.

- Also, the demand for gas from the QCLNG Project is estimated to result in a slower uptake of gas for electricity generation in Queensland compared to a scenario where no large-scale LNG developments occur (although overall gas consumption is estimated to be higher).
- If some of the LNG projects proposed for Queensland do not proceed then this will increase gas availability for the Queensland and eastern Australia gas market. With or without the QCLNG Project, competition between gas suppliers in the Queensland and eastern states gas markets will remain high.

10.3.1.5 Housing and Accommodation

The Project's direct impact on housing is likely to be relatively small due to the provision of temporary and permanent worker camps (as described in *Chapter 6*). However, flow-on employment impacts, estimated to be approximately 400 to 500 people during the construction phase in the Darling Downs region and 825 in the Fitzroy region, could have potentially larger ramifications for local housing provision and prices where increases in population are not planned appropriately. This is described in *Chapter 6* of this volume.

10.3.1.6 Other impacts

Other potential impacts of the QCLNG Project include:

- a small reduction in agricultural land availability in the Darling Downs region (approximately 0.1 per cent) and, potentially, agricultural production capacity in the region over the life of the Project. The reduction in

agricultural production from this loss of productive land is expected to be relatively insignificant. Importantly, the land occupied by CSG fields may be returned to the original use once the CSG resources are extracted. Demand and competition for labour is expected to impact the agriculture sector more than the removal of land from production. Both impacts diminish over the life of the Project

- with other proposed developments, the cumulative impacts of the QCLNG Project could have significant implications on demand and supply of local labour, housing, business and services. Where demand outstrips supply this will place upward pressure on prices. In this context labour demand could have ramifications for local small businesses
- the timing of the QCLNG Project may help offset some detrimental impacts from the current global economic downturn which has caused a reduction in Australian exports and economic growth. By providing a significant capital injection to the economy, the QCLNG project will generate economic activity and employment and boost Queensland's balance of trade.

10.3.2 Australian, Queensland and Regional Content

Around half of the capital expenditure proposed for the QCLNG Project during construction is expected to be sourced from Australia, including an estimated 18.4 per cent from within the Darling Downs and Fitzroy regions (refer to Table 8.10.1).

It is expected that approximately 79 per cent of operating expenditure will be sourced from within Australia. Approximately 31 per cent of expenditure will be sourced locally from the Darling Downs and Fitzroy regions. A summary of direct expenditure from the Project retained in the regional and state economies is provided in the table below.

Note that the operational stage of the Project will still involve considerable capital expenditure as the development of the Gas Field Component will continue after 2014.

Table 8.10.1 Construction and Operating Expenditure by Region

	Construction (%)	Operating (%)
• Darling Downs	• 9.4%	• 21.5%
• Fitzroy	• 9.0%	• 9.6%
• Rest of Queensland	• 19.6%	• 33.7%
• Rest of Australia	• 10.6%	• 14.6%
• Foreign Imports	• 51.3%	• 20.7%
• Total	• 100.0%	• 100.0%

Note: Operating expenditure includes ongoing expenditure on exploration and well development.
Source: QGC (2009); Prime Research

The percentage of operating expenditure directed towards foreign imports (20.7 per cent) reflects the ongoing development of components of the QCLNG Project. Certain items of infrastructure and materials, in particular chemical products and mechanical equipment, may only be sourced internationally. QGC's Local Content Policy requires the company to provide full, fair and reasonable opportunity for Queensland and Australian companies to supply goods and services to the Project, commensurate with the quality, safety reliability and delivery standards required by the Project.

10.3.3 Potential Needs for Skills Training

For both the Darling Downs and Fitzroy regions, net employment creation as a result of the QCLNG Project is projected to be largest for technicians and trades workers, professionals and management occupations. A large construction workforce is required in both regions and temporary skills shortages could be experienced for some trades. Strong demand for labour could lead to an increase in the average annual real wage over the construction period of 2.6 per cent per annum for the both Darling Downs and Fitzroy regions.

Skills shortages are a greater risk for Gladstone, where a number of construction projects are under consideration. During previous non-residential construction booms in Gladstone, vacancies for these occupations (technicians and trades workers, professionals and management) have been difficult to fill as have vacancies for production and transport workers and some clerical and sales positions.

Between 2014 and 2021 (during the operation phase), labour demand across the Project is estimated to be highest for occupations including professionals, technicians and trade workers, managers, and clerical and administrative workers. This is likely to draw labour from sectors such as construction, transport and storage, electricity, gas and water, and agriculture, forestry and fishing, as well as less skilled/lower income manufacturing industries.

Competition for labour and other inputs may adversely affect existing local businesses. Modeling suggests agricultural output in the Darling Downs could fall modestly between 2010 and 2021 as a result of the Project. The average annual contraction is expected to be less than 0.5 per cent. This is predominantly due to competition for labour but also reflects a reduction in agricultural land, lost to the Gas Field Component development.

Research by the Project has identified the following skills shortages in the Gladstone market for tradespeople:

- scaffolders
- insulators
- steel fixers
- concrete finishers
- specialised welders.

It is likely that the proposed LNG Facility itself would draw upon specialist labour based in the Northern Territory and Western Australia. Some on-the-job training is likely.

The local workforce required for the QCLNG Project is likely to benefit from training programs delivered as part of the proposed Project. This would produce a permanent lift in the skills of these workers and the capacity of regional labour forces to respond to future industrial projects. Training and labour force development strategies are outlined in *Section 6.4.1* and *Chapter 8* of this volume.

10.3.4 Need for Any Additional Infrastructure Provision by Government

This assessment is based on an infrastructure audit conducted by GHD (2009), with findings summarised in *Table 10.2*. The assessment is confined to the localities of Gladstone City, Calliope, Boyne Island and Tannum Sands. Much of the assessment concerns the infrastructure needs of the LNG Facility's workforce (construction and operational). Assessment of infrastructure capacity and requirements in the Gas Field Component region is being undertaken in consultation with the Western Downs Regional Council, and indicates the need for some infrastructure upgrades (including roads and potentially regional airports) to meet the cumulative demands of proposed projects in this region.

Table 8.10.2 Infrastructure Requirements

Infrastructure Type	Description
Population and Housing	The number of construction staff re-locating to Gladstone over the next three years could be in the order of 2,000-6,500 persons depending on which of the proposed projects proceeds and their timing. Temporary workers' camps will be needed to house the majority of construction workers
Water (potable)	The Gladstone Area Water Board and the Gladstone Regional Council operate the majority of water infrastructure in the Gladstone area. It is estimated that the additional infrastructure needed in the potable water supply system to accommodate workers from the construction and operation of the QCLNG Project LNG Facility would be minimal. This is because of substantial spare capacity in the system.
Waste Water	The majority of sewerage treatment plants in the region are operating with spare capacity. The workers' camp proposed for the QCLNG' Project is expected to have its own sewerage treatment plant and will not impact on the capacity of existing treatment plants.
Electricity	The transmission of high voltage power is normally the responsibility of Powerlink in Queensland, a Government-owned corporation. Powerlink has commenced the acquisition of land to support the anticipated increase in Gladstone's electricity demand over coming years. Ergon Energy is reportedly the only electricity retailer in Gladstone. Information supplied to both companies suggests some substations may need to be augmented to cope with the additional residential demand from workers. Augmentations by Powerlink to the high voltage network may also be necessary for the LNG Facility.
Waste	The region is well placed to accommodate the waste generated from the influx of people to the general community. Land fill sites are the only publicly owned assets used in waste services (along with some recycling facilities in the next 12 months). It is not expected that additional capital expenditure on public land fill sites will be required in the near-term. The workers' camps are likely to incorporate an on-site waste storing facility.
Telecommunications	The supply of telecommunications services is open to the free market. Should there be sufficient demand, infrastructure will be upgraded at the cost of the service provider. No government provision is anticipated in this field.

Infrastructure Type	Description
Airport	Gladstone airport is owned and operated by the Gladstone Regional Council. Given the number of major projects proposed for Gladstone and reliance on fly-in/fly-out workers, an upgrade to the airport is being proposed. The cost of the upgrade will be recovered through a higher landing tax. Details on the budgeted cost of the upgrade may be necessary. The increased passenger load from the upgrade cannot be wholly attributed to the LNG Facility.
Rail	It is not currently anticipated that any significant amount of rail freight will result from the LNG Facility and associated workforce.

Source: GHD (2009).

10.3.5 Future Development in the Local Region

10.3.5.1 Future Development in the Dalby-Roma Region

QGC currently holds multiple petroleum tenures within the Walloon Fairway of the Surat Basin, covering an area of approximately 468,000 hectares located predominantly within the Dalby Regional Council area (in the vicinity of Miles, Chinchilla, Condamine and Tara townships). A small portion of the fields are south west of Wandoan on land within the Roma Regional Council area. The Condamine River bisects the tenure areas and the predominant land use is rural for dry land cropping and grazing.

The majority of the land within the CSG tenement boundaries (approximately 65 per cent) is classified Class C Pasture Land (i.e. not Good Quality Agricultural Land – GQAL). The remainder is composed of GQAL Class A (18 per cent) and Class B (17 per cent).

The QCLNG Project will require a total of approximately 6,000 wells over the life of the Project. Well heads will be connected via pipelines to a series of field compression stations (FCSs) and central processing plants (CPPs). In total, the QCLNG Project will require approximately 7,000 hectares for the development of CSG wells and associated infrastructure. This is anticipated to primarily impact on grazing activities, as grazing accounts for more than 70 per cent of land use within the CSG tenement area, as well as other agricultural activities such as cropping. However, in context, this is a relatively small area compared to the existing agricultural activities in the Darling Downs region (accounting for just 0.1 per cent of agricultural land in the Darling Downs region).

Facilities for CSG processing and compression will be located, wherever possible, on land owned by QGC. The nature of CSG production and the infrastructure employed allows the land occupied by CSG fields to be returned to the original use, which is predominantly grazing, once CSG resources are extracted. Land used for well development is to be progressively rehabilitated as core exploration, appraisal and production wells and associated infrastructure are no longer required. A detailed decommissioning and rehabilitation plan will be developed prior to the decommissioning phase of the Gas Field Component of the project, with consideration given to landholder requirements.

This means there are no identified long-term implications for future development.

10.3.5.2 Future Development Along the Pipeline Route

Construction of the Pipeline Component will temporarily disrupt existing activities (predominantly agriculture) during the construction period, including approximately 1,293 hectares of land classified as GQAL. The pipelines would not have any long-term impact on existing agricultural activities. Cropping activities would only be affected for the period of construction and could resume once the land is reinstated. There should be limited impact on grazing activities from pipeline construction and operations. Some temporary relocation of cattle may be required during construction to prevent accidental injury from, for example, an open trench. This would be for a very limited period.

Pipeline development will result in the clearing of approximately 1,462 hectares of native vegetation. It is QGC's intention to either rehabilitate bushland during Project decommissioning or engage in biodiversity offset plantings to match the vegetation clearing.

Once the pipeline route is established, restrictions would be placed on the future use of the easement for a public transport corridor as well as on the installation of other infrastructure (e.g. telecommunications lines, power transmission networks). Registration of the pipeline easements ensures that any future development takes into account the presence of the pipeline.

10.3.5.3 Future Development in the Gladstone Region

The Gladstone region has been identified as a highly suitable location for export of LNG to international markets due to its proximity to export port facilities and relative proximity to CSG fields. The QCLNG Project is one of a number of LNG facilities currently proposed for the Gladstone region.

Global LNG supply capacity has increased considerably in the past couple of years to meet high international demand for natural gas (Global LNG Info, 2008). However, the international market will not be able to support all the currently proposed LNG facilities. And from a local and regional community perspective, it is unlikely that Queensland could support the development of all the proposed LNG facilities in the time frames proposed, given the implications this would have for, among other issues, local and regional labour availability, housing and welfare.

The Gladstone region offers significant available land for industry development in the Gladstone State Development Area (GSDA) and already supports substantial industrial activities, with a number of large manufacturing operations in the region.

Given the existing industrial base in the region and the Project's location within the recently enlarged GSDA, development of the QCLNG Project is not likely to present any significant implications or constraints to existing industry and surrounding land use other than to facilitate and encourage industrial clustering and support networks. The development of the Curtis Island site will constrain future uses across the footprint of the LNG Facility. However, given the abundance of industrial land within the GSDA, this is not anticipated to have any tangible impact.

10.3.5.4 *Relevance to Central Queensland Strategy for Sustainability*

The Central Queensland Strategy for Sustainability (CQSS2) is a regional development plan developed in 2004 by the Fitzroy Basin Association. Of relevance to this assessment, CQSS2 includes aspirations for the regional economy. It includes a target that "by 2050, the region has a robust and well balanced economy which is economically, socially and ecologically sustainable, and able to withstand external pressures".

The Project's potential economic impact is consistent with the development of a robust and well-balanced economy. The QCLNG Project will increase demand for regional goods and services, boost employment opportunities and promote the stability of employment in key industries. The Project will also diversify the regions' economies and reduce their dependence on mining and agriculture, and support regional growth through sustainable, long-term stimulus to local and regional economies.

10.4 CONCLUSION

The Queensland Curtis LNG (QCLNG) Project is estimated to stimulate an increase in Queensland gross state product of approximately $32 billion between 2010 and 2021, or approximately $2.6 billion per annum.

The Project will provide a direct multi billion dollar capital injection during the primary construction phase and generate substantial benefits including employment and value-added activity in regional economies. Approximately half the Project's capital expenditure during 2010-2013 will be sourced from within Australia, including 18.4 per cent from within the Fitzroy and Darling Downs regions. In addition, almost 80 per cent of the Project's expenditure during 2014-2021 will be sourced from within Australia.

The Project will generate benefits including:

- approximately $2.4 billion in value-added activity in Queensland during the construction phase (2010 to 2013)
- approximately $29.5 billion in value-added activity in Queensland during the operations phase (2014 to 2021)
- employment of approximately 60,000 full-time equivalent years over a 12-year period from construction to steady-state production
- annual average royalty income for Queensland between $150 million and $330 million and annual average tax income for the Australian Government between $600 million and $1.1 billion, depending on oil prices.

Mitigation strategies have been identified to maximise benefits and minimise adverse economic impacts from the Project, including supporting local business, building capacity in the local labour market, minimising use of agricultural land and impacts on local property. These are discussed in *Chapter 8* of this volume.

Overall, the QCLNG Project will provide a significant capital injection to the economy that will generate economic activity and employment and boost Queensland's balance of trade, helping to offset the impacts of the current global economic downturn.