North East Gold Coast strategic land use, economic development and infrastructure study

Issues and options paper

Department of Infrastructure and Planning in association with Gold Coast City Council and Logan City Council

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1 Introduction

The Department of Infrastructure and Planning—in conjunction with Gold Coast City and Logan City councils—is undertaking a strategic land use, economic development and infrastructure study for North East Gold Coast (North East Gold Coast study).

The study area is predominantly rural and non-urban land situated between Brisbane and the Gold Coast.

The purpose of the North East Gold Coast study is to develop a land use and infrastructure strategy (the strategy) that identifies the best possible balance between competing land uses in the study area.

The strategy will be considered as part of the review of the South East Queensland Regional Plan 2005–2026 (SEQ Regional Plan). The draft SEQ Regional Plan 2009–2031 will be released for consultation in December 2008 and is intended to be finalised in mid 2009.

This issues and options paper provides a comprehensive analysis of the regional and sub-regional context of the study area, its values, constraints and opportunities. The issues and options paper establishes strategic directions to guide the development of the land use and infrastructure strategy, and provides a basis for consultation with key stakeholders.
2 Overview

2.1 Background

The *South East Queensland Regional Plan 2005–2021* (SEQ Regional Plan) was released in June 2005 and sets out a strategy for managing South East Queensland’s population growth, which is expected to grow from around 2.77 million residents in 2006 to around 3.85 million in 2026.

Most of the North East Gold Coast study area is located within the Regional Landscape and Rural Production Area as identified in the SEQ Regional Plan. This land use category identifies land that has regional landscape, rural production or other non-urban values and protects these areas from inappropriate urban development.

Much of the non-urban land in the area is used for the production of sugarcane, which supplies the local Rocky Point mill.

The SEQ Regional Plan also identifies an investigation area for possible expansion of marine industries at Steiglitz on the coast.

The study area contains a wide range of values and natural resources that, in combination with its location and relatively large agricultural land holdings, have meant that it has faced a variety of development pressures for many years.

While extensive urban development in the study area would be contrary to the strategy directions in the SEQ Regional Plan, there are competing rural and resource uses, including sugarcane production and extraction of sand resources, which need to be resolved.

Additionally, there is a range of other land use pressures in the study area, including expansion of the marine industry and general expansion of industrial areas adjacent to the M1 transport corridor, which need to be resolved through the development of a long-term strategy.

In early 2007 there was a formal submission seeking significant project declaration under Part 4 of the *State Development and Public Works Organisation Act 1971* for a proposal (known as the i-METT proposal) to establish a major development comprising a motor sports precinct, hotel precinct, theme park, education and technology precincts, motor museum and cultural centre within the study area. The location of the i-METT project is described in section 3.9.

In February 2008 the Coordinator-General declared the i-METT project a significant project, which triggers a requirement for preparation of a detailed environmental impact statement (EIS). This does not mean that the state government supports the project, instead ensuring that the environmental, social and economic impacts of the project are considered thoroughly before the project can be approved. An independent evaluation of the i-METT proposal is currently underway.

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1 An amendment to the SEQ Regional Plan (Amendment 1) was released in October 2006. Amendment 1 is primarily concerned with updating the SEQ Regional Plan by incorporating outcomes from the *Mt Lindesay/North Beaudesert Study Area Study Report*. The SEQ Regional Plan and Amendment 1 can be accessed from the Department of Infrastructure and Planning website at www.dip.qld.gov.au.
2.2 Objective and outcomes

The objective of the North East Gold Coast study is to recommend a clear and deliverable strategy for the study area. The recommended strategy will be consistent with the strategic directions and regional policies set out in the SEQ Regional Plan which establishes the broad growth management framework for the region to 2026.

The strategy will address opportunities for multiple and sequential land use such as requirements for rehabilitation and reuse of extractive industry sites, the potential synergies between alternative land uses and the appropriate timing of major land use changes including conversion of agricultural land to extractive industry use.

The strategy outcomes will include:
- a clear descriptive intent of the overall strategy for the study area
- clear identification of preferred strategic land uses and timing, including the performance criteria that should be applied to ensure the overall strategic intent and outcomes are not compromised
- a cadastral-based land use plan and associated implementation strategies for any proposed or expanded land uses (e.g. agricultural or marine industry precincts)
- an infrastructure strategy that support the land use strategy
- specific recommendations for amendments to the SEQ Regional Plan, including cadastral definition of proposed changes to the regional land use category boundaries.

The strategy will inform the review of the SEQ Regional Plan and guide required amendments to the Gold Coast City and Logan City planning schemes.
3 The study area

3.1 Location
The North East Gold Coast study area is situated in a highly accessible location between the two major urban areas in South East Queensland—Greater Brisbane and the Gold Coast. Map 3.1 shows the location of the study area in the context of the SEQ region.

The study area comprises approximately 17 250 hectares of land bounded by the Logan River to the north, the Pacific Motorway (M1) to the west, Yawalpah Road and the Urban Footprint boundary to the south and southern Moreton Bay to the east.

3.2 Existing land uses
The combination of satellite imagery (Queensland Government, 2005) and cadastral data (Digital Cadastral Database, Department of Natural Resources and Water, October 2007) presented in Map 3.2 shows the main land uses in the study area.

The majority of the study area is rural/non-urban in nature. However, a variety of urban land uses are located predominantly around the edges of the study area as described in the following paragraphs.

Along the western fringe of the study area adjacent to the M1 motorway, the land uses are mainly urban in nature, comprising urban residential development at Eagleby and Ormeau. There is a strip of industrial and business land uses between these two residential areas occupying the area between the M1 and the Brisbane–Gold Coast railway line, and extending east of the railway line at Stapylton to encompass the Yatala Stapylton Business Centre and the Landmark Industrial Park. All of these business and industry areas form part of the much bigger Yatala Enterprise Area, which extends west of the M1 (outside the study area).

South of the Ormeau residential area is the inter-urban break between Brisbane and the Gold Coast. The inter-urban break comprises predominantly rural/natural areas adjacent to and between the Pimpama River and Hotham Creek, but also includes a low-density rural residential subdivision between Pimpama and Ormeau.

The southern boundary of the study area follows Yawalpah Road to just west of Kerkin Road and then follows the Urban Footprint boundary to the coast. Land uses along this boundary comprise the village of Pimpama and the Gainsborough Greens Golf Club. (There are approvals for residential development both within the golf course site and on adjacent lands to the west—see section 3.9). Otherwise, the land along the southern boundary is rural/non-urban in nature with natural vegetation becoming more predominant closer to the coast.

Along the coastal boundary of the study area are the predominantly residential villages of Cabbage Tree Point and Jacobs Well. Approximately 1.5 kilometres south of Cabbage Tree Point lies the Horizon Shores Marina development, which currently provides around 500 wet berths and supporting marine infrastructure. The master plan for Horizon Shores envisages an expansion to 1400 wet berths (with possible future marina connectivity to adjoining land to the north) plus a full range of supporting infrastructure and services, including marine retail, light and heavy marine industry, dry boat storage, yacht club and hotel accommodation.

The narrow coastal strip between Cabbage Tree Point and Horizon Shores accommodates a number of smaller marine industry activities, including Maas Marina immediately north of Horizon Shores and small-scale marine industry at Walkers Jetty immediately south of Cabbage Tree Point.
South of Jacobs Well is Calypso Bay, comprising a 250 berth marina and canal estate and golf course residential development, which is likely to provide around 900 lots and 1400 dwellings when completed.

The rest of the study area is predominantly rural/non-urban in nature. This area accommodates a significant range of activities and land uses. The most significant of these are identified on Map 3.2 and are described below. An increasing number of the smaller lots in the rural/non-urban areas are being used for rural lifestyle purposes, such as equestrian activities.

**Sugarcane production**
The study area contains the only significant sugarcane industry in South East Queensland. The report of the Regional Advisory Group (South) into the Rocky Point sugar industry identified 61 cane-growing entities concentrated around the Rocky Point mill, where cane has been grown for many years. There are also two cane mulch plants operating in the study area. Refer to section 5.4 for more information on the cane industry.

**Rocky Point Mill, Distillery and Cogeneration Plant**
The Rocky Point mill at Woongoolba was established in 1879. Owned by W H Heck and Sons Pty Ltd, it is both the smallest and the only family owned mill in Australia. The company has pursued a diversification policy into niche markets for sugar products, the production of alcohol (including ethanol), burning of green wastes and co-generation of electricity. Refer to sections 3.9 and 5.4 for more information on the Rocky Point Mill.

**Aquaculture**
As shown on Map 3.2, there are eight aquaculture enterprises (prawn farms and hatcheries) in the study area, the majority of which are either adjoining or located near the Logan River, between Alberton and Woongoolba. These farms have a combined pond area of approximately 130 hectares. Refer to section 5.5 for more information on the aquaculture industry in the study area.

**Motor sport activities**
There are two significant motor sport facilities in the study area. These are the Holden Performance Driving Centre at Norwell, which provides a 2 kilometre training circuit, an off-road four-wheel drive training course and supporting facilities, including conference room and onsite catering. The WRX Experience facility at Pimpama provides a 1.2 kilometre gravel circuit set among 35 hectares of cane fields, together with associated supporting infrastructure.

**Extractive industry**
Map 3.2 shows the locations of the main extractive industry activities in the study area. There are two hard rock quarries at Stapylton, operated by Aztec (north of Jacobs Well Road) and Boral (Rossmans Road). Between these two lies a closed hard rock quarry site (Quarry Road and Rossmans Road) that was formerly operated by CSR but is now used by Gold Coast City Council as a wastewater storage site.

There are also two areas of sand extraction activity. The area identified just west of Jacobs Well is operated by two separate companies (Wholesale Sands Pty Ltd and Pimpama Sands Pty Ltd). The area at Eagleby is operated by River Sands Pty Ltd. Sand is pumped across the Logan River from Eagleby for processing at a plant at Carbrook. In addition to these operations, the site identified at Woongoolba (Neumann's) is included in the Extractive Industry domain and has an approval for extractive industry use. However, it is understood that there are currently no sand extraction activities on this site.

There is also a number of current and recent applications for extractive industry, as described in section 3.9. The satellite imagery also shows the voids left from earlier sand extraction activities, for example north of the current operations at Jacobs Well and just north of the Pimpama River at Norwell. The voids created by extractive activities in the study area provide
opportunities for reuse for a range of activities including water-based recreation. Refer to section 5.3 for more information on the extractive industries in the study area.

**Heck Field Aerodrome**

Heck Field aerodrome is a small sports and recreation aviation aerodrome located to the north-west of Jacobs Well township and south of Behm Creek. It is opposite the Air Services Australia VOR (VHF omni receiver) aviation facility, also within the Jacobs Well locality.

Heck Field Aerodrome has two gravel runways both approximately 750 metres long and 15 metres wide. It is operated by the Gold Coast Sports Flying Club and is on privately owned land.

As well as a small clubhouse/aircraft operations room there are more than 20 hangars built at the aerodrome, with the ability to house more than 60 aircraft. Some aircraft maintenance, repairs and aircraft rebuilds also occur at this aerodrome.

Other significant land uses identified on Map 3.2 include the Stapylton Landfill facility, Pimpama Island Sports Complex and the Jacobs Well Environmental Education Centre.

### 3.3 Natural resource values

#### 3.3.1 Soils

The soils of the Rocky Point area have been described by Holz (1979), Forster (1989) and more recently Ellis and Wilson (2007) and CSIRO (2007). The major soils have formed predominantly on a low-lying alluvial plain in the centre of the area and in an area of elevated high river terraces in the north. To the east, the area is bounded by marine plains and to the west by undulating, to steep hills of mudstone. In addition, isolated areas of low sand ridges are located to the west of Jacobs Well and low sandstone rises occur in scattered locations in the north, east and west of the area.

The predominant soils in the alluvial plain area are hydrosols (humic gley and peaty gley soils). The gley soils are associated with a high water table, water-logging and an extremely acid pH. Humic gleys, particularly those with a clay loam to loamy sand (or fine textured characteristic) are the most productive soils in the region and cover an area of around 6500 hectares (approximately 70 per cent of the area). Peaty gleys occur in depressions and drainage lines can contain small salt patches and are predominantly found around the area of the Sandy Creek swamp.

Dermosols (gilgaied acid clay soils) occurring on the high terraces of the Logan and Albert rivers have a highly acid pH and generally poor physical characteristics, which reduces water infiltration and root penetration. This area is suitable for a reduced range of agricultural uses.

The reclaimed hydrosols of the marine plain in the east are saline gley soils occurring along the coastline that have a very high salt level due to periodic inundation by saltwater. They are unsuitable for agriculture.

Kurosols and shallow tenosols (red-yellow podzolic soils), known locally as ‘forest soils’, occur on the slopes of the hills in the west and south of the region and are generally considered marginal for agriculture. Deeper dermosols (red podzolic soils) are found on small areas of sandstone rises adjacent to the Logan River and are suitable for a range of horticultural tree crops.

Podosols (siliceous sands) occupy the low sand ridges around the Jacobs Well area and in small pockets south of the Pimpama River. These sandy soils are characterised by very poor structure and a very low available soil moisture and nutrient-holding capacity. With irrigation, these small areas have potential for a range of horticultural crops.
Map 3.3 shows the good quality agricultural land in the study area, which is based on the areas mapped as being either suitable (Class A land) or marginal (Class B land) for growing sugarcane, as identified by the Department of Infrastructure and Planning, utilising the latest land suitability information provided by the Department of Natural Resources and Water. See section 5.4.5 for more information on land suitability for agriculture in the study area.

### 3.3.2 Ecosystem services

This section of the report is drawn from the CSIRO report (CSIRO, 2007) addressing the future use of the Rocky Point cane landscapes and the ongoing SEQ ecosystem services project coordinated by SEQ Catchments. The CSIRO report has identified specific natural assets and the services provided by the cane landscapes on the Gold Coast. While all economies depend on their local natural assets, regions like the Gold Coast that have a mixture of agricultural pursuits, retirement living and tourism as their economic base, depend on their natural assets more than most.

Ecosystem services are the benefits that people obtain from ecosystems. Ecosystem services consist of flows of materials, energy and information from natural and modified ecosystems, which combine with manufactured and human capital services to provide benefits to human wellbeing. Ecosystem services include provisioning services such as food, water, timber, fuel and fibre; regulating services such as air quality, water quality, disease prevention, a habitable climate, arable land and pollination; and cultural services that provide recreation, aesthetic, therapeutic, inspirational and spiritual benefits. These services are supported by ecosystem functions, defined as the biological, geochemical and physical processes and components that take place or occur within an ecosystem (ecological processes).

The study area consists primarily of coastal floodplains, intertidal zones containing various species of mangroves, super-tidal zones with salt marshes and sand flats, extra-tidal poorly drained areas with buffalo grass flats and casuarina communities and freshwater areas above tidal limits containing freshwater wetlands, wallum and banksia communities. The wetland and intertidal areas are highly productive ecosystems, providing habitat and food for many species. A large proportion of commercial and recreational seafood including fish, shellfish and crustaceans are dependent on estuarine wetlands at some stage of their lifecycle (O’Neill, 2000).

The coastal floodplains, including wetlands and estuaries, have aesthetic values and cultural connections and provide for aquatic water sports and recreation activities, which contribute substantially to the quality of life in coastal communities. Agriculture, fishing and tourism industries, among others, utilise either directly or indirectly various ecological attributes of floodplains. The wetlands, estuaries and connected near shore ecosystems are the most ecologically productive components of the global ecosystem, where a combination of physical and chemical processes can support the highest level of ecosystem services (Costanza et al., 1997).

While there is a substantial body of biophysical information available for the cane landscapes, very little of this information has been analysed from the ecosystem services perspective. An initial analysis of ecosystem functions across the SEQ region has shown that the cane growing region in the North East Gold Coast area primarily provides the two ecosystem functions of food and soil formation, while the surrounding tidal mangrove areas provide disturbance and nutrient regulation, raw material and landscape opportunity functions. Comprehending the relative value and importance that the local and regional communities place on these services is challenging and further research is necessary to understand this relationship.

Only a small number of studies have been specifically conducted to estimate the economic value of various ecosystem services in South East Queensland. The gross value of agricultural production in the North East Gold Coast area was $24.7 million in 2001, which is underpinned by ecosystem services. The CSIRO report (CSIRO, 2007) provides some examples of estimates of the value the community places on the use and protection of various natural assets.
3.3.3 Extractive resources

The study area contains extensive deposits of both hard rock and sand resources. These resources are of regional and sub-regional significance and are identified as key resource areas (KRAs) in State Planning Policy 2/07: Protection of Extractive Resources. Each KRA contains three elements—a resource/processing area, a separation area and an associated transport route (which also includes a transport route separation area) where such a link is needed from the resource/processing area to a major road or railway.

The KRAs in the North East Gold Coast study area are shown on Map 3.3. Section 5.3 provides more information on the extractive industry in the study area.

3.4 Nature conservation values

3.4.1 Introduction

The eastern sector of the study area is characterised by a low-lying alluvial floodplain formed by the Pimpama, Albert and Logan River systems. In the western sector along the Pacific Motorway, low hills of 40–80 metres occur, with Mt Stapylton the highest landmark at approximately 150 metres Australian Height Datum (AHD).

A majority of the floodplain sector (approximately 90 per cent) has been previously cleared and drained to grow sugarcane and graze livestock, and these land uses still dominate today.

The less flood prone areas on the higher elevations in the western and southern edges of the study area have not been as extensively cleared for agriculture but are now being progressively cleared for urban residential and industrial development adjacent to the M1 motorway.

The following sections describe the study area’s important nature conservation values. These values are shown on Maps 3.4A–C.

3.4.2 Significant ecological values

Despite previous and ongoing disturbance, a number of habitat areas of significant ecological value remain within the study area. Further to this, some of the previously disturbed areas contain regrowth vegetation that may have the ability to reach remnant status if protected and enhanced. The major habitat types in the study area are shown on Map 3.4A.

Tidal wetlands

The Moreton Bay coastline supports extensive fringing coastal woodlands, mangrove forests, saltmarsh, saltpan, sandflats and mudflats. These communities collectively provide vital roost and stopover sites for shorebirds and migratory waders. There are five relatively intact tidal wetland areas associated with the estuaries of the Pimpama River and McCoys Creek in the south, tidal waterways at Jacobs Well and Steiglitz (Behm Creek), Sandy Creek on the Logan River and a large mangrove forest at the estuary of the Logan River in the far northeast corner of the study area.

Freshwater wetlands/wallum heath

A number of remnant paperbark woodlands are scattered throughout the coastal floodplain in depressions on sandy soils, with the Woongoolba Conservation Park being one of the largest remnants.

Previously widespread wallum heath communities dominated by Banksia aemula have now also been mostly cleared, but some smaller remnants still survive west of Jacobs Well.

Eucalypt forests

Patchy remnants of eucalypt forest are found along the western and southern sectors, mainly on the higher ground associated with the Neranleigh-Fernvale metamorphics.
Remnant forest of Pink Bloodwood, Forest Red Gum (*Eucalyptus tereticornis*) and Paperbark is found along the Albert and Logan River corridors, and in patches along the Pimpama River and associated floodplains within the Coomera-Pimpama Koala Conservation Area.

**Waterways and water quality**

The study area is drained by a number of waterways, with the most significant in terms of catchment and associated ecological values being the Logan and Albert Rivers in the north, Behm Creek at Steiglitz and the Pimpama River, Hotham Creek and McCoys Creek in the south.

The Logan River estuary along with its tributaries and wetlands, the Pimpama River, Behm and McCoys Creeks and Moreton Bay are all scheduled under the Environmental Protection Policy (EPP) for Water (1997) and tabled accordingly (2007). The environmental values and water quality objectives for these waterways should be protected and enhanced, consistent with the water quality objectives for each basin under the policy.

There is a broad network of drainage canals that facilitate agricultural uses within the study area. Sandy Creek and Behm Creek have been extensively modified higher in the catchment for drainage purposes. McCoys Creek, Behm Creek and the Pimpama River all contain significant coastal wetlands up to 4 kilometres upstream from Moreton Bay, indicating the presence of high ecological values in these areas.

The *SEQ Healthy Waterways* report card for 2007 found that water quality in the Logan and Albert Rivers is poor, reflecting the levels of disturbance in these larger catchments. Water quality in the tidal creeks and the Pimpama River estuary is relatively good.

In general however, the water quality of Southern Moreton Bay, into which the study area drains, is relatively worse than other sections due to island configuration, ocean currents and land uses in the Logan and Albert River catchments. In response, major emphasis has been placed on restoration of water quality in the Logan/Albert catchments in the *SEQ Healthy Waterways Strategy 2007–2012.*

Water quality within the study area will be directly affected by the economic activities proposed within this area (e.g. acid sulfate soil contamination from extractive industries) as well as existing land uses upstream within the Urban Footprint. Existing and proposed economic activities within the study area will need to ensure no increase in the impact on already degraded environmental systems and that the environmental values and water quality objectives for these waterways are protected and enhanced, consistent with the water quality objectives for each basin under the EPP (Water) 1997.

New development or redevelopment should ensure that environmental values and water quality objectives for these waterways are protected and achieved by:

- maintaining natural water infiltration and flows through use of water sensitive urban design (WSUD) principles
- using best practice urban stormwater quality and quantity management.

**Threatened or otherwise significant flora and fauna**

Despite their relatively small size and lack of continuity, the remnant coastal forests, wetlands and heathlands of the study area support a high diversity of uncommon flora and fauna and provide important foraging and roosting areas for many native mammals, birds, reptiles and amphibians.

As an example, 17 of the 24 Australian raptors have been recorded using the Eagleby Wetlands Reserve near the Albert River corridor. In terms of listed rare and threatened species, the study area is known to support 1 species of amphibian, 3 reptiles, 31 birds, 3 mammals and 10 plants. A comprehensive list of threatened species and species of other particular significance that have been recorded within the study area is provided in Appendix B.
Other fauna species of special significance in the area (but not listed as threatened species) include:

- migratory bird species listed under bilateral migratory birds agreements between the Australian Government and the Governments of Japan (JAMBA), the People’s Republic of China (CAMBA) and the Republic of Korea (ROKAMBA)
  - *Actitis hypoleucos* (Common Sandpiper)
  - *Ardea alba* (Great Egret)
  - *Ardea ibis* (Cattle Egret)
  - *Calidris acuminata* (Sharp-tailed Sandpiper)
  - *Calidris ferruginea* (Curlew Sandpiper)
  - *Charadrius leschenaultia* (Greater Sand Plover)
  - *Charadrius mongolus* (Lesser Sand Plover)
  - *Gallinago hardwickii* (Latham’s Snipe)
  - *Hirundapus caudacutus* (White-throated Needletail)
  - *Limosa lapponica* (Bar-tailed Godwit)
  - *Merops ornatus* (Rainbow Bee-eater)
  - *Numenius phaeopus* (Whimbrel)
  - *Pandion haliaetus* (Osprey)
  - *Plegadis falcinellus* (Glossy Ibis)
  - *Pluvialis fulva* (Lesser Golden Plover)
  - *Stern albigrons* (Little Tern)
  - *Stern caspia* (Caspian Tern)
  - *Tringa nebularia* (Greenshank)
  - *Tringa stagnatilis* (Marsh Sandpiper)
  - *Xenus cinereus* (Terek Sandpiper)
- *Tachyglossus aculeatus* (Short-beaked Echidna—recognised as having special cultural significance under the *Nature Conservation Act 1992*)
- *Tisiphone abeona* (Varied Sword-grass Brown—a butterfly species of particular regional and local significance).

### 3.4.3 Ecological corridors

The fragmented nature of the remaining habitats enhances the importance of identifying and protecting/restoring ecological corridors that connect the coastal plain, both internally and to the core habitat areas to the west (Darlington Ranges) and east (Moreton Bay and islands). These corridors are currently narrow and patchy and are primarily associated with waterways that cross the coastal plain.

In terms of scale and extent, the most significant existing (and potential) ecological corridors in the study area follow the Albert River, the Logan River, Sandy Creek (potential), the Hotham Creek/Pimpama River waterway corridor and McCoys Creek.

The inter-urban break, generally located along the Pimpama River and Hotham Creek, will form the most significant of the ecological corridors through the study area. The inter-urban break plays an important role on the Gold Coast, providing a significant green break between development in the Pimpama/Ormeau area to the north and Coomera to the south.

In addition, the Moreton Bay coastline itself forms a corridor for a range of mobile fauna such as bats, birds and fish.

Opportunities exist to identify other corridor locations linking significant environmental reserves, such as along Pimpama River and Behm Creek, as well as additional east-west corridors that may not be associated with a waterway. While corridors along the major waterways are more easily achievable, other factors may end up playing a part in the overall feasibility of a major east-west bioregional corridor, such as existing development commitments.
3.4.4 Nature conservation status

Gold Coast City still supports one of the highest levels of biodiversity of any city in Australia. As many coastal habitats have been drained and cleared for agricultural and urban development, the remnants have taken on considerable nature conservation significance.

Where remnant vegetation exists within the study area, it is a mix of 'endangered', 'of concern' and 'not of concern' designations under the Vegetation Management Act 1999. The regional ecosystem mapping prepared by the Environmental Protection Agency (EPA) indicates that much of the remnant vegetation in the study area is currently classified as 'not of concern'. 'Endangered' and 'of concern' regional ecosystems are also distributed in patches across the study area, as shown on Map 3.4B.

Taking the presence of significant flora and fauna species into account, virtually all mapped areas of remaining native vegetation in the study area are considered to be of state or regional biodiversity significance under the EPA’s SEQ biodiversity planning assessment (as shown on Map 3.4C).

The Pimpama River and McCoys Creek estuaries are designated fish habitat areas.

The large mangrove area on the Logan River, the mangrove area immediately east of the Calypso Bay development and the Pimpama River and McCoys Creek estuaries are part of the RAMSAR listed wetlands of Moreton Bay.

3.4.5 Land use planning status

Many of the remaining significant habitat areas within the eastern sector of the study area are designated in some type of nature conservation tenure or open space zone. The major environmental infrastructure contained within the study area includes conservation areas at Pimpama, Yellowwood, Stapylton and Behm Creek.

In addition, much of the remaining eucalypt forest in the western sector (Ormeau, Stapylton and Eagleby) is located within urban and extractive industry zonings along the motorway.

3.4.6 Koala Conservation Plan 2006

The east Coomera-Pimpama koala habitat area between the Pimpama River and McCoys Creek (plus a smaller area on Yawalpah Road) is designated as a Koala Conservation Area (KCA) under the Nature Conservation (Koala) Conservation Plan 2006 and Management Program 2006–2016. These two areas are separated by land associated with Gainsborough Greens golf course that is designated as an urban koala area.

The main characteristics are:

- Koala conservation areas. These are the most important areas of koala habitat with the highest koala population densities. They provide critical source areas for the survival and dispersal of koalas across the landscape because of the high degree of connection between areas of habitat. They are large areas of relatively intact remnant or regrowth eucalypt-dominated forest and woodlands but sometimes contain cleared areas and areas of fragmented forests and woodlands. KCAs can include a mosaic of private and public lands and park estate with limited infrastructure and urban development.

- Urban koala areas. These are areas subject to recognised urban planning intent within local government planning instruments. They may contain patches of fragmented remnant and regrowth eucalypt-dominated forest and woodlands with cleared areas, and have varied levels of connectivity between habitat patches. These areas may contain both high and low koala habitat values and/or high koala population densities.

Despite their importance for the survival of the koala, some areas within the east Coomera-Pimpama KCA are identified as preferred development areas and are included in the priority infrastructure area in the Gold Coast City planning scheme (refer to Maps 4.5 and 6.1).
plans conflict with the intent of the KCA and the SEQ Regional Plan and should be addressed when the planning scheme is reviewed.

3.4.7 Strategic nature conservation values

In combination with in situ habitat and ecological values, the study area also supports broader values of strategic significance to nature conservation on the Gold Coast.

Firstly, some of the most significant koala habitat in Gold Coast City includes the eucalypt forests and woodlands on the floodplains and low ridges near the Pimpama River, McCoys Creek and the Coomera River, within and adjacent to the southern section of the study area. The koala population in this area has been estimated to be around 500 animals, approximately 70 per cent of which are thought to inhabit the Urban Footprint area (Biolink 2007). Hence, the koala population will be significantly affected by committed development in the Coomera Town Centre and surrounding areas.

In response to this recent finding, Gold Coast City Council is taking the lead in preparing a koala conservation strategy for the East Coomera area. This strategy is planned to include a koala translocation and monitoring program, as well as preparation of an overall koala conservation plan for the longer term. Investigations are currently underway to establish the potential for securing and restoring suitable habitat within the KCA as a basis for re-establishing a viable koala population in the area over the medium to longer term.

Secondly, the development of East Coomera will also sever the identified bioregional ecological corridor connecting the Darlington Ranges to Moreton Bay. There is a potential to mitigate this impact by enhancing the ecological corridor values of the Hotham Creek/Pimpama River waterway corridors within the inter-urban break, and the other ecological corridors in the study area.

In this context, the existing inter-urban breaks between Pimpama and Ormeau, the associated waterway corridors of the Pimpama River and the relatively intact coastal habitats of the Pimpama River and McCoy Creek estuaries represent an important area for nature conservation in Gold Coast City and the SEQ region. The importance of seeking to achieve nature conservation outcomes within this area is accentuated by the extent of urban development along much of the South East Queensland coast.

3.5 Physical constraints to development

3.5.1 Flood hazard

The main physical constraint affecting the study area is flooding and the potential impacts of climate change on the flood regime. Map 3.5 shows the flooding information available for the study area based on recent flood modelling work undertaken by Gold Coast City Council.

The minimum flood level in Gold Coast City is 2.32 metres AHD, comprising 2.05 metres for storm surge and 0.27 metres for sea level rises. The designated flood affected areas shown in Map 3.5A, is the maximum level of the 1974, 100 year and storm surge (with sea level rise) flood surfaces 2.

As depicted on Map 3.5A, a high proportion of the study area is potentially affected by flooding. Much of the flood-affected area would be flooded to a depth of greater than 1.0 metres and roads providing access to the central and eastern parts of the study area would be impassable. Areas that are unlikely to be affected by flooding are limited to the urban area at Eagleby, elevated areas along the western edge of the study area between Ormeau and Stapylton, an area at Stapylton both north and south of Jacobs Well Road and various pockets of elevated land, including some along the southern boundary of the study area.

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2 The flood data shown on Map 3.5 is different to council’s designated flood surface (Map OM 17 in the Gold Coast City planning scheme), as it is based on the most recent flood modelling work.
The constraint code for flood affected areas in the Gold Coast City planning scheme sets out performance criteria and acceptable solutions for development in flood affected areas.

### 3.5.2 Bushfire and landslip

The constraints maps also show the potential bushfire management areas (Map 3.5B) and areas of unstable soils and areas of potential landslip hazard (Map 3.5A) from the Gold Coast City Council planning scheme overlay maps OM10 and OM 16 respectively.

There are very limited areas of bushfire and landslip hazard within the study area, predominantly on the sloping lands on the western side of the study area near the M1. The only significant area of high potential bushfire risk and the only area of high risk of instability are at Mt Stapylton.

### 3.5.3 Acid sulfate soils

The study area contains acid sulfate soils and several sites with potential contaminated land. These are also shown on Map 3.5B. These are not hard constraints to development but require specific management. The guideline to State Planning Policy 2/02 Planning and Managing Development Involving Acid Sulfate Soils (see section 4.3.3) states that, where practicable, land use strategies should avoid or minimise the disturbance of acid sulphate soils.

### 3.5.4 Aeronautical facility

There is also an Airservices Australia VOR aviation facility at Jacobs Well which needs to be protected through specific development constraints within a 100 metre buffer radius, as set out in Gold Coast City Council planning scheme constraint code for Gold Coast airport and aviation facilities.

This code aims to prevent permanent or temporary physical line of sight obstructions, overhead wires exceeding 5 metres in height, metallic structures exceeding 8 metres in height, trees and open lattice towers exceeding 10 metres in height and wooden structures exceeding 13 metres in height. The location of the Airservices facility and associated buffer area are shown on Map 3.5B.

### 3.6 Landscape character and scenic amenity

#### 3.6.1 Landscape character

Landscape character embraces both natural and built form elements and comprises three components of aesthetic appeal, historic or heritage values and identity and sense of place (Preston, June 2006). The internationally recognised definition is:

*Landscape character is the distinct and recognisable pattern of elements that occur consistently in a particular type of landscape and how these are perceived by people. It reflects particular combinations of geology, landform, soils, vegetation, land use and human settlement. It creates the particular sense of place of different areas of the landscape* (Swanwick, 2002).

Gold Coast City Council has mapped its very diverse landscapes and produced visual diaries of each of the 10 landscape character areas (planning scheme map PS10). These form part of the landscape character of the city set down in one of council's key strategies, Landscape Strategy 15 and Policy Council 12, that guide the image of the city. The visual diaries for landscape character area 7.0 Albert Corridor and character area 8.0 Beenleigh and Sugarcane provide guidance on the important landscape character elements to be promoted, enhanced and protected within the study area. The visual and spatial contextual relationships between each of these areas as important component parts of the perceived city image are important, especially where views into the study area, and views out from the study area, are recognised and valued.
3.6.2 Scenic amenity values

The SEQ Regional Plan Implementation Guideline No.8 Identifying and Protecting Scenic Amenity Values (September 2007) adopt the following definition of scenic amenity: a measure of relative contribution of each place in the landscape to the collective appreciation of open space as viewed from places that are important to the public (Department of Natural Resources and Water, 2001).

The scenic amenity values of the study area have been assessed. Scenic landscapes and their visual components provide amenity benefits to residents and generate wealth for commercial activities. Scenic amenity is recognised by the planning scheme of the Gold Coast City Council as an important tourism asset that contributes to the image and landscape character of the Gold Coast.

The study area is characterised by an extensive agricultural area predominantly devoted to growing sugarcane, and patches of mangroves, coastal woodlands and eucalypt forest. An assessment of scenic amenity values identified that, while the sugarcane areas themselves provide only moderate scenic amenity, the relatively low height and density of this crop affords views of mountains, bushland, rocky outcrops and waterways that have high appeal. Important fragments of retained native vegetation are scattered throughout the study area and also have high scenic amenity ratings.

Areas of regionally significant scenic amenity in the study area (as shown on Map 3.6) include:
- slopes of Mount Staplyton
- natural vegetation on elevated lands near the Pacific Motorway between the Pimpama River and Hotham Creek (which forms part of the inter-urban break between Brisbane and the Gold Coast)
- waterways and open space adjacent to crossings of the Pacific Motorway and Robina-Brisbane railway line with the Pimpama, Logan and Albert Rivers
- small patches of cane land and retained vegetation visible from the Pacific Motorway along the length of the Pacific Motorway and Gold Coast–Brisbane railway line.

Other important scenic opportunities provided by the study area include:
- views into rural cane land from scenic routes between Stapylton, Jacobs Well and Ormeau (the Gold Coast planning scheme identifies the canelands tour road route and the Albert/Logan River water route as the key scenic routes in the study area)
- views across the study area by passengers of recreational boats on southern Moreton Bay looking toward the Gold Coast Hinterland.

In addition, the proposed intra-regional transport corridor (see section 6.2) will provide enhanced viewing opportunities to Mount Staplyton, as well as across the canelands to Moreton Bay, river crossings and retained natural vegetation in the vicinity of the proposed road.

Scenic amenity of the study area can be maintained or enhanced through special management of view corridors between popular viewing locations and rural, natural, waterway and elevated scenery (especially Mount Staplyton).

3.7 Indigenous and non-Indigenous cultural heritage

3.7.1 Heritage values

Gold Coast City Council recently conducted a study of heritage values (Beenleigh and Sugarcane Land—Heritage and Character Study, June 2007) of an area that included the North East Gold Coast study area except for a small area between Hotham Creek and Yawalpah Road (between the M1 and Gainsborough Greens).
The study was limited to the historic environment and did not attempt to investigate the other two components—natural and Indigenous—that are included in the Australian Heritage Council’s definition of the Australian ‘cultural environment’.

Within the North East Gold Coast study area, the heritage study identified three places that were considered to be of potential state significance and likely to satisfy the requirements for inclusion on the Queensland Heritage Register. These are:

• mill at Rocky Point mill precinct, Woongoolba
• main house at Rocky Point mill precinct, Woongoolba
• butcher shop at Rocky Point mill precinct.

The study also identified a further 28 places of local heritage importance, of which 7 are located at Eagleby, 3 at Yatala and 18 in the canelands and coastal areas. These places are listed in Appendix C. They include buildings, farm structures, cemeteries, archaeological sites and landscape features relating to the settlement and development of the area from the 1860s.

The study also identified four places of potential significance requiring further investigation. These included the former Ageston Sugar Plantation and Mill on Faciles Road, Alberton; a waterhole at 93 Quinns Road, Stapylton; Kerkin’s Arrowroot Mill on Kerkins Road, Jacobs Well; and a possible abattoir on School Road, Woongoolba. Additionally, 10 places which, for various reasons, are not recognised as being of high heritage significance are still of some historical interest. The study notes that the level of significance of places may change, or other previously unidentified places may emerge in the future following further research or new information.

3.7.2 Management actions to maintain non-Indigenous heritage values

In Queensland, items of non-Indigenous cultural heritage significance to the state are managed by the EPA and the Queensland Heritage Council under the provisions of the Queensland Heritage Act 1992. The Act established the Queensland Heritage Register, which is a record of state heritage places, archaeological sites and protected areas. The Act also covers shipwrecks and the discovery of archaeological items, making it mandatory to report the discovery of an archaeological artefact of possible significance to the state, and making it an offence to interfere with an important archaeological discovery or a shipwreck more than 75 years old within Queensland waters.

Heritage places can also be managed through local government planning schemes. The Gold Coast City Council’s planning scheme contains the Cultural Heritage (Historic) Constraint Code, which regulates development on and adjacent to sites included on the National Trust of Queensland list, the Commonwealth’s Register of the National Estate, the Queensland Heritage Register and any list of local heritage places identified in a local area plan.

Another key legislative framework for the conservation of cultural heritage is the Coastal Protection and Management Act 1995. Under the provisions of the Act, state and regional coastal management plans are implemented which regulate development on or near coastal heritage sites: within 100 metres of places, areas and items that are entered in the Queensland Heritage Register or land containing or within 100 metres of cultural heritage places and objects identified in a regional coastal plan or in a local government planning scheme preparation process.

Apart from shipwrecks and the discovery of archaeological sites, as specified in the Queensland Heritage Act 1992, there is currently little formal protection or management of non-Indigenous heritage sites within the study area. There are no sites on any of the above lists and registers and no local area plan with heritage provisions in place. Due to this lack of protection, the Beenleigh and Sugarcane Land Heritage and Character Study recommends
that heritage planning controls be developed, including the listing of heritage places on appropriate registers.

3.7.3 Indigenous cultural heritage

The Aboriginal Cultural Heritage Act 2003 and Torres Strait Islander Cultural Heritage Act 2003 define Aboriginal cultural heritage as:

- a significant Aboriginal or Torres Strait Islander area in Queensland
- a significant Aboriginal or Torres Strait Islander object
- evidence of significant archaeological or historic Aboriginal or Torres Strait Islander occupation of an area of Queensland.

The legislation protects areas or objects that are significant to Aboriginal or Torres Strait tradition or custom. The area around a place or object may also be considered part of that place or object and it is not necessary for the area to contain markings or physical evidence to be of significance.

A number of cultural heritage surveys and finds made by local Indigenous groups have been undertaken and culturally significant material has been located throughout the study area. The duty of care guidelines of the Aboriginal Cultural Heritage Act 2003 must be referred to when undertaking any land use changes to the study area.

There are no Indigenous cultural heritage places in the study area shown on the Indigenous Cultural Heritage Map produced by the Department of Natural Resources and Water. However, this map only shows 200 of the most important Indigenous cultural heritage sites in Queensland.

There are records of other significant places in the Aboriginal and Torres Strait Islander Cultural Heritage Database, and the Aboriginal and Torres Strait Islander Cultural Heritage Register, which are administered by the Department of Natural Resources and Water. There may also be places of Indigenous cultural heritage that are as yet unrecorded.

This would need to be investigated as part of more detailed local planning or site development studies.

3.8 Population characteristics

The information on population characteristics is drawn from a Demographic Report on North East Gold Coast Study Area (Planning Information and Forecasting Unit, Department of Infrastructure and Planning, March 2008). The report analysed census data from 1996, 2001 and 2006. Map 3.8 shows the 2006 census collection districts and the grouping of those collection districts into geographic areas for the purposes of the analysis.

These geographic areas comprise the four population centres of Eagleby, Jacobs Well, Ormeau and Steiglitz and a predominantly rural hinterland area. As shown on Map 3.8, the rural areas south of the Pimpama River have been excluded from the demographic analysis, as these areas are included in much larger collection districts that, in some cases, extend as far south as the Coomera River. The excluded portion of the study area is relatively undeveloped and its exclusion is unlikely to have a material effect on the results of the data analysis.

Unfortunately, there were significant changes to the collection district boundaries between the censuses that make direct comparisons between census periods difficult. Population growth between the 1996 and 2001 censuses resulted in the centres of Ormeau and Steiglitz being separated from the hinterland area, which is referred to in the report as ‘remainder’.

Further urban growth around Eagleby, Jacobs Well and Ormeau between the 2001 and 2006 censuses led to the expansion in the area of these centres and the consequential reduction of the size of the remainder area. Census information for Ormeau and Steiglitz was not available
at the 1996 census. Also, population change between 2001 and 2006 in Jacobs Well and Ormeau is attributable not only to growth in population but also the expansion of the area of these centres for the 2006 census.

3.8.1 Population

Table 3.8A shows population and population change between 1996 and 2006.

The estimated resident population of the study area at 30 June 2006 was 17,096 people—an increase of more than 4000 between 1996 and 2006, or 2.7 per cent on an average annual basis. In comparison, Queensland’s rate of population growth over the same period was 2.1 per cent annually. In the study area, the largest population increase over the decade occurred within the past five years, when the average annual population increase was 730 people, or 4.9 per cent annually.

Population growth was strongest in the urban residential areas. The largest absolute growth occurred in Ormeau between 2001 and 2006, with an average annual increase of almost 500 people, or 20.9 per cent. The expansion of the area of Ormeau as a result of collection district changes for the 2006 census contributed to this population growth. Eagleby’s population change between 2001 and 2006 was the second highest in the study area, with an average annual increase of 175 people, or 2.0 per cent. The population of Jacobs Well increased by almost 100 people, or 10.0 per cent annually, between 2001 and 2006. As noted above, the area of Jacobs Well also increased between 2001 and 2006 as a result of collection district boundary changes to recognise the residential development at Calypso Bay.

Table 3.8A—Population and population change, 1996 to 2006 (p)

<table>
<thead>
<tr>
<th>Census collection district groupings</th>
<th>Estimated resident population at 30 June</th>
<th>Average annual population change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1996 no.</td>
<td>2001 no.</td>
</tr>
<tr>
<td>Eagleby</td>
<td>8624</td>
<td>8488</td>
</tr>
<tr>
<td>Jacobs Well</td>
<td>678</td>
<td>793</td>
</tr>
<tr>
<td>Ormeau</td>
<td>n/a</td>
<td>1572</td>
</tr>
<tr>
<td>Steiglitz</td>
<td>n/a</td>
<td>422</td>
</tr>
<tr>
<td>Remainder</td>
<td>3774</td>
<td>2170</td>
</tr>
<tr>
<td>North East Gold Coast</td>
<td>13,076</td>
<td>13,445</td>
</tr>
<tr>
<td>Queensland</td>
<td>3,339,109</td>
<td>3,628,946</td>
</tr>
</tbody>
</table>

Notes: p = preliminary; n/a = not available separately
Source: Australian Bureau of Statistics, unpublished statistics

The apparent decline of the remainder area’s population between 1996 and 2006 is due to the size of the remainder area contracting as the population growth of Ormeau, Jacobs Well and Steiglitz was recognised through the enlargement of existing collection districts or the creation of new collection districts. For example, Ormeau and Steiglitz were not defined as separate areas in the 1996 census, when their populations were included in the remainder area.

3.8.2 Age profile

Table 3.8B presents data on the age profile in the study area in 2006. Distribution of the population of the study area by age group in 2006 was similar to that of Queensland as a whole. Age group distribution within the study area was reasonably similar from place to place.
The relatively faster growing residential areas at Ormeau and Eagleby had the highest proportions of children aged 0–14, with 24.6 per cent and 22.7 per cent respectively. The age profile for the remainder rural area is also reasonably consistent with the state average with 40.9 per cent of the population aged 45 and over, compared to 36.9 per cent for Queensland, and 27.8 per cent in the 25–44 years age cohort compared to 28.6 per cent for Queensland.

### 3.8.3 Labour force status

The labour force of the study area comprised 5079 people in 1996 and reached 6865 in 2006—an increase of 1786 people, or 35.2 per cent. The proportion employed full-time remained at approximately two-thirds of the labour force between 1996 and 2006, with about one-quarter employed part-time. Unemployment was much higher in 1996 and 2001 at (17.8 per cent and 15.1 per cent respectively) than in 2006, when the rate was 6.7 per cent.

According to the 2006 census, a total of 3441 people were in the labour force and lived in Eagleby. This number represented about half (50.1 per cent) of the labour force of the study area. Ormeau accounted for 1697 people in the labour force, or nearly one-quarter (24.7 per cent) of the total. There were 6408 people employed and 457 people unemployed in the study area at the time of the 2006 census.

Table 3.8C presents information on employment and labour force participation rates. At the time of the 2006 census, rates of full-time and part-time work were similar throughout the study area, with 65–73 per cent employed full-time and 20–29 per cent employed part-time.
### Table 3.8C—Employment and participation rates, 2006

<table>
<thead>
<tr>
<th>Census collection district groupings</th>
<th>Per cent employed: full time (a)</th>
<th>Per cent employed: Part time</th>
<th>Per cent unemployed</th>
<th>Labour force participation rate (b) (c)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eagleby</td>
<td>65.3</td>
<td>28.2</td>
<td>9.3</td>
<td>51.0</td>
</tr>
<tr>
<td>Jacobs Well</td>
<td>65.6</td>
<td>28.6</td>
<td>4.2</td>
<td>60.6</td>
</tr>
<tr>
<td>Ormeau</td>
<td>68.3</td>
<td>24.9</td>
<td>4.4</td>
<td>60.3</td>
</tr>
<tr>
<td>Steiglitz</td>
<td>72.5</td>
<td>20.3</td>
<td>1.3</td>
<td>60.7</td>
</tr>
<tr>
<td>Remainder</td>
<td>65.9</td>
<td>27.0</td>
<td>3.8</td>
<td>62.4</td>
</tr>
<tr>
<td>North East Gold Coast Study Area</td>
<td>66.4</td>
<td>27.0</td>
<td>6.7</td>
<td>55.5</td>
</tr>
<tr>
<td>Queensland</td>
<td>64.5</td>
<td>29.0</td>
<td>4.7</td>
<td>61.1</td>
</tr>
</tbody>
</table>

(a) employed full-time is defined as having worked 35 hours or more in all jobs during the week prior to census night, (b) applicable to persons aged 15 years and older, (c) excludes overseas visitors

Source: ABS, 2006 Census of Population and Housing, Table P39

The unemployment rate in Eagleby (9.3 per cent) was the highest in the study area. Also, Eagleby had the lowest labour force participation rate (51.0 per cent), which is defined as the labour force (persons employed or unemployed) expressed as a percentage of the population aged 15 years and over. The remainder area had the highest participation rate, and second lowest level of unemployment after Steiglitz. Overall, excluding Eagleby, the labour force participation in the study area was consistent with that of Queensland (61.1 per cent).

### 3.8.4 Household income

The distribution of gross household incomes in the study area showed some differences from the income distribution of Queensland households on average (Table 3.8D).

### Table 3.8D—Weekly income distribution—households, 2006

<table>
<thead>
<tr>
<th>Income range</th>
<th>Eagleby</th>
<th>Jacobs Well</th>
<th>Ormeau</th>
<th>Steiglitz</th>
<th>Remainder</th>
<th>North East Gold Coast Study Area</th>
<th>QLD</th>
</tr>
</thead>
<tbody>
<tr>
<td>$0–$249</td>
<td>7.9</td>
<td>7.3</td>
<td>3.1</td>
<td>3.6</td>
<td>9.0</td>
<td>6.9</td>
<td>6.6</td>
</tr>
<tr>
<td>$250–$499</td>
<td>17.3</td>
<td>11.9</td>
<td>11.1</td>
<td>4.6</td>
<td>14.1</td>
<td>14.8</td>
<td>11.6</td>
</tr>
<tr>
<td>$500–$999</td>
<td>33.4</td>
<td>28.4</td>
<td>19.9</td>
<td>32.1</td>
<td>25.5</td>
<td>29.3</td>
<td>24.1</td>
</tr>
<tr>
<td>$1000–$1699</td>
<td>22.8</td>
<td>26.1</td>
<td>30.0</td>
<td>29.1</td>
<td>25.2</td>
<td>25.0</td>
<td>25.2</td>
</tr>
<tr>
<td>$1700 and over</td>
<td>7.2</td>
<td>18.0</td>
<td>26.9</td>
<td>23.0</td>
<td>18.0</td>
<td>13.9</td>
<td>20.7</td>
</tr>
<tr>
<td>Partially stated</td>
<td>11.3</td>
<td>8.4</td>
<td>9.1</td>
<td>7.7</td>
<td>8.1</td>
<td>10.1</td>
<td>11.8</td>
</tr>
<tr>
<td>(c)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

(a) Count of occupied dwellings excluding "Other not classifiable" households, (b) Comprises households where at least one, but not all, member(s) aged 15 years and over did not state an income and/or was temporarily absent on Census Night, (c) Comprises households where no members present stated an income

Source: ABS, 2006 Census of Population and Housing:Table P28

In the study area as a whole, the proportion of households that earned weekly incomes of $1 700 and over (13.9 per cent) was smaller than the proportion of total Queensland households (20.7 per cent) in this income range. However this was largely due to Eagleby where only 7.2 per cent of households exceeded this income level. Ormeau had the highest proportion of high income households (26.9 per cent) followed by Steiglitz with 23 per cent.
Households earning less than $250 per week comprised 6.9 per cent of all households in the study area, compared to 6.6 per cent for Queensland. The highest proportions of households in this income category were found in the remainder area (9 per cent) and Eagleby (7.9 per cent).

### 3.8.5 Housing

A total of 5,345 occupied private dwellings or almost 9 out of 10 (87.9 per cent) dwellings in the study area at the 2006 Census were separate houses (Table 6A). The remaining 736 dwellings comprised similar numbers of semi-detached houses, flats and units and other dwellings. Most of the dwellings other than separate houses in the study area were found in Eagleby. The exception was the ‘other dwellings’ category, which includes caravan, cabins and improvised homes. A total of 202 of these dwellings, out of a total of 277 in the study area, were found in the remainder area.

#### Table 3.8E—Structure of occupied private dwellings, 2006

<table>
<thead>
<tr>
<th>Dwelling type</th>
<th>Eagleby</th>
<th>Jacobs Well</th>
<th>Ormeau</th>
<th>Steiglitz</th>
<th>Remainder</th>
<th>North East Gold Coast Study Area</th>
<th>QLD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Separate house</td>
<td>2,949</td>
<td>486</td>
<td>1,217</td>
<td>197</td>
<td>496</td>
<td>5,345</td>
<td>1,154,277</td>
</tr>
<tr>
<td>Semi-detached/row or terrace house/townhouse etc</td>
<td>241</td>
<td>0</td>
<td>3</td>
<td>3</td>
<td>6</td>
<td>253</td>
<td>113,395</td>
</tr>
<tr>
<td>Flat/unit or apartment</td>
<td>170</td>
<td>0</td>
<td>30</td>
<td>0</td>
<td>6</td>
<td>206</td>
<td>196,473</td>
</tr>
<tr>
<td>Other dwelling</td>
<td>54</td>
<td>21</td>
<td>0</td>
<td>0</td>
<td>202</td>
<td>277</td>
<td>42,926</td>
</tr>
<tr>
<td>Dwelling structure not stated</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1169</td>
</tr>
<tr>
<td>Total</td>
<td>3,414</td>
<td>507</td>
<td>1,250</td>
<td>200</td>
<td>710</td>
<td>6,081</td>
<td>1,508,240</td>
</tr>
</tbody>
</table>

Source: ABS, 2006 Census of Population and Housing, Table P31

In most cases, average occupancy rates for occupied private dwelling types in the study area were similar to those for Queensland (Table 6B). For example, the average occupancy rate for separate houses was 2.8 persons per dwelling and the rate for all dwellings was 2.6 persons per dwelling. These rates were equal to the corresponding Queensland figures. Overall, occupancy rates in Eagleby and Ormeau were slightly higher than in other areas.

#### Table 3.8F—Average occupancy(a) of occupied private dwellings, 2006

<table>
<thead>
<tr>
<th>Dwelling type</th>
<th>Eagleby</th>
<th>Jacobs Well</th>
<th>Ormeau</th>
<th>Steiglitz</th>
<th>Remainder</th>
<th>North East Gold Coast Study Area</th>
<th>QLD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Separate house</td>
<td>2.7</td>
<td>2.4</td>
<td>3.0</td>
<td>2.4</td>
<td>2.9</td>
<td>2.8</td>
<td>2.8</td>
</tr>
<tr>
<td>Semi-detached/row or terrace house/townhouse etc.</td>
<td>1.5</td>
<td>0.0</td>
<td>1.0</td>
<td>2.3</td>
<td>3.0</td>
<td>1.6</td>
<td>2.0</td>
</tr>
<tr>
<td>Flat/unit or apartment: total</td>
<td>1.7</td>
<td>0.0</td>
<td>2.0</td>
<td>0.0</td>
<td>0.7</td>
<td>1.8</td>
<td>1.8</td>
</tr>
<tr>
<td>Other dwelling: total</td>
<td>1.2</td>
<td>1.8</td>
<td>0.0</td>
<td>0.0</td>
<td>1.5</td>
<td>1.5</td>
<td>1.9</td>
</tr>
<tr>
<td>Dwelling structure not stated</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>2.4</td>
</tr>
<tr>
<td>Total</td>
<td>2.6</td>
<td>2.4</td>
<td>2.9</td>
<td>2.4</td>
<td>2.5</td>
<td>2.6</td>
<td>2.6</td>
</tr>
</tbody>
</table>

(a) Persons per dwelling

Source: ABS, 2006 Census of Population and Housing, Table P31
3.8.6 Socio-economic characteristics

The 2006 Census preliminary Index of Relative Socio-economic Disadvantage (preliminary IRSD) released by the ABS summarises a wide range of information on disadvantage, including low income, little education, high unemployment and unskilled occupations.

The index is designed to focus on aspects of disadvantage. A lower score indicates that an area is relatively disadvantaged compared to an area with a higher score. Scores should only be used in distributive analysis. To enable easy recognition of high and low scores, the collection district index scores have been standardised to have a mean of 1000 and a standard deviation of 100 across all collection districts in Australia.

Even though the index scores have a mean of 1000, they should always be used as ordinal variables. An area with an index score of 500 is not necessarily twice as disadvantaged as another area with a score of 1000. However, an area with a lower index score is relatively more disadvantaged than another area which has a higher index score (Source: Adhikari, P., Socio-Economic Indexes for Areas: Introduction, Use and Future Directions, 2006, ABS Cat. No. 1351.0.55.015).

Table 3.8G—Socio-economic indexes, 2006

<table>
<thead>
<tr>
<th>Census collection district groupings</th>
<th>Weighted average preliminary IRSD score</th>
<th>Number of CDs in CD grouping</th>
<th>Number of CDs in 1st decile</th>
<th>Highest decile score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eagleby</td>
<td>870</td>
<td>15</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>Jacobs Well</td>
<td>1 001</td>
<td>3</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Ormeau</td>
<td>1 039</td>
<td>5</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>Steiglitz</td>
<td>1 027</td>
<td>1</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>Remainder</td>
<td>990</td>
<td>6</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>North East Gold Coast Study Area</td>
<td>938</td>
<td>30</td>
<td>7</td>
<td>10</td>
</tr>
</tbody>
</table>

Source: ABS, socio-economic index for areas (SEIFA), Data Cube only, 2006, Cat No. 2033.0.55.001

Eagleby demonstrates a relatively high level of socio-economic disadvantage with an IRSD score of 870. With the exception of Eagleby, all collection district groupings in the study had weighted average preliminary IRSD scores close to or above the Australian mean.

As well as preliminary IRSD scores, the ABS socio-economic index for areas (SEIFA) gives every geographic area a decile rank. The lowest 10 per cent of areas are given a decile number of one, up to the highest 10 per cent of areas which are given a decile number of 10. If we define disadvantaged areas as those areas with their IRSD score in the first decile, almost half of the 15 collection districts in Eagleby are disadvantaged. None of the collection districts in the other parts of the study area had IRSD scores in the first decile. One collection district in Ormeau had a decile score of 10, and one collection district in the remainder had a decile score of seven.

3.9 Major development proposals

The following paragraphs describe the significant current and recent development proposals in the study area. The sites of these development proposals are shown on Map 3.8.

3.9.1 i-METT project

The i-METT proposal is for a major multi-function development on a 400 hectare stage 1 site plus a 200–400 hectare buffer at Gilberton/Norwell within the study area. The indicative i-METT site is shown on Map 3.9.
The i-METT proposal includes an international standard 6.5 kilometre motor racing circuit together with a number of precincts including an international motor racing museum and cultural centre, hotel precinct, theme park, education precinct and technology precinct. Stage 2 of the development proposal would occupy the 200–400 hectare buffer area to the Stage 1 development. The land uses comprising Stage 2 of the development proposal have not been determined but could potentially include an additional theme park.

The site is within the Regional Landscape and Rural Production Area regional land use category under the SEQ Regional Plan. The development proposal is inconsistent with the intent of this designation, and would not comply with the regulatory provisions of the SEQ Regional Plan.

The i-METT proponents made a formal submission to the state government in January 2007 seeking both significant project declaration under Part 4 of the State Development and Public Works Organisation Act 1971 by the Coordinator-General and exemption from the regulatory provisions of the SEQ Regional Plan by the Planning Minister. The Coordinator-General declared the i-METT project a significant project in February 2008. The project has not been granted exemption from the regulatory provisions of the SEQ Regional Plan.

A significant project declaration allows coordinated management of government approvals, and requires the preparation of a detailed environmental impact statement (EIS). It does not equate to government support for the project. As part of the EIS the proponent will be required to address any issues raised through this study.

A draft Terms of Reference for the i-METT project was advertised for public comments on Saturday 28 June 2008 with submissions closing on Monday 28 July 2008.

Following consultation, the Coordinator-General will consider the EIS, all submissions on it and other information as necessary to compile a report. The Coordinator-General’s Report can recommend approval, approval with conditions or refusal of a project.

3.9.2 Extractive industry proposals

In September 2007, there were three development applications for extractive industry activities associated with the extraction of sand from the key resource areas in the study area. The locations of these recent and current applications are shown on Map 3.9.

The site of the development proposal at Jacobs Well was not identified as good quality agricultural land, and the development application was approved by Gold Coast City Council in October 2007.

The sites of the other two applications are regarded as good quality agricultural land. The development proposal at Holmstead Road, Steiglitz (adjacent to the Rocky Point mill) has not been decided.

The development application at Norwell Road, Norwell was subject of an appeal (Fieldray vs Gold Coast City Council and Others [2007] QPEC 098) by the applicant against council’s refusal of the development application. One of the significant matters at issue in the appeal was the apparent conflict between two State Planning Policies (SPP): SPP 1/92 Development and the Conservation of Agricultural Land, and SPP 2/07 Protection of Extractive Resources.

Both SPPs were relevant to the development site. The appeal was refused on the grounds that the appellant had not demonstrated ‘overriding need’ for the development proposal in the terms set out in SPP 1/92, nor sufficient grounds to justify approval of the development application despite the conflicts with the Gold Coast City Council’s planning scheme.

The decision supported the contention that compliance with both SPPs is possible, in that the pursuit of agricultural purposes in no way impinges on protection of extractive resources which, rather than immediate exploitation, is the essence of SPP 2/07.
In arriving at the decision the judge disagreed with the applicant’s contention that the loss of cane productivity from the site will not have a noticeable impact on the local sugar industry, noting in the decision that “…it is not enough to demonstrate a below-average production of cane on the site, even the diversion of a good part of it in the last couple of years to equine activities. The site has clear potential for use to grow cane for supply to the mill. This is so notwithstanding that, on its own, it may not represent an economic proposition. It can be (indeed, it has been) farmed in association with other land in the district’.

The Fieldray case highlights the need to determine a balance between the objectives of SPP1/92 (the protection of good quality agricultural land) and SPP2/07 (the protection of extractive resources in the study area).

3.9.3 Nursery precinct
The Nursery and Garden Industry Queensland (NGIQ—the state’s peak industry body representing the nursery industry), in conjunction with the Gold Coast City Council and the then Department of State Development, undertook an investigation into the feasibility of establishing a nursery precinct (cluster of nurseries and related activities) in the northern part of the study area.

A broad area of investigation was identified in the Stapylton area to take advantage of the availability of treated effluent water from the Beenleigh Wastewater Treatment Plant via the Stapylton wastewater storage facility.

A feasibility investigation commissioned by the NGIQ (Northern Gold Coast Nurseries Precinct—Feasibility Investigation, Final Report, The Heilbronn Group, June 2003) found that a nursery cluster would be feasible, and identified the sites shown on Map 3.9 as the most suitable locations after taking a broad range of factors into consideration.

The nursery precinct proposal did not proceed mainly due to difficulties in developing a coordinated investment and development strategy. This required the commitment of a large number of nursery industry stakeholders who all had different financial and other circumstances affecting their existing businesses and sites.

However, it is understood that a couple of large nursery operators have purchased land in the study area and are intending to pursue individual nursery development opportunities. A nursery industry representative advised that these initiatives were being hampered by uncertainty associated with the state government’s proposal to take control of all bulk water assets.

Initially this included taking control of wastewater treatment plants, which meant that Gold Coast Water was unable to guarantee long-term supply of treated effluent to the nursery proponents. However in January 2008, the state government announced that the final assets transfer would not include wastewater treatment plants, which will remain in council ownership.

3.9.4 Heck Field Aerodrome (aviation proposals)
The study area contains a small private aerodrome, Heck Field, situated between Steiglitz and Jacobs Well and used by the Gold Coast Sports Aviation Club. This airfield, shown on Map 3.9, is a candidate site for an aviation and pilot education and flight training academy.

Two major Australian organisations are currently undertaking a detailed business case for the academy concept, and have had preliminary discussions with the state government and Gold Coast City Council. However, at this stage there has been no formal development application to either the state government or to Gold Coast City Council.

A variety of accommodation arrangements is under consideration for the flight training academy. Preliminary assessment suggests that a proposal that involved student accommodation and extensive training facilities (e.g. flight simulators) on-site at Heck Field,
which is in the Regional Landscape and Rural Production Area, would be unlikely to comply with the SEQ Regional Plan.

However a proposal that limited development at Heck Field to facilities directly linked with flying activities would be more likely to comply with the regional plan’s regulatory provisions, which exclude aeronautical facilities from the definition of ‘urban activity’ and limits the establishment of urban activities in the Regional Landscape and Rural Production Area.

There may be further opportunities for Heck Field to be used for the testing and development of small aircraft, such as unmanned aerial vehicles. The Queensland Government recognises that unmanned aerial vehicles are a major growth sub-sector of the aviation industry and initiatives to capture this growth are being pursued. Heck Field Aerodrome is potentially suitable for these purposes, due to its strategic location in relation to controlled and uncontrolled airspace within the southern part of South East Queensland.

3.9.5 Ormeau school proposal

The Lutheran Church of Australia (Queensland District) lodged a development application for a material change of use for an educational establishment, childcare centre, catering business and caretaker’s residence on the site identified in Map 3.9 in June 2005.

The site is immediately adjacent to and east of the Ormeau railway station with access from Mirambeena Drive. The site is included in the emerging communities domain and in the small lot rural and open space/landscape precincts of the inter-urban break structure plan in the Gold Coast City planning scheme, and in the Regional Landscape and Rural Production Area land use category in the SEQ Regional Plan.

The development application was changed in November 2006 in an effort to make it more compatible with the intent of the Regional Landscape and Rural Production Area regional land use category. A referral coordination information request was made in respect of the application in February 2007. The applicant was required to provide the information response by 22 February 2008.

Among the matters raised in the information request was a concern by the Department of Infrastructure and Planning that the development proposal is an urban activity under the SEQ Regional Plan’s regulatory provisions, and that the applicant is required to demonstrate how the proposed development complies with the location requirements and overriding need tests in Division 2 of the regulatory provisions.

The response to the information request was not lodged within the required period and the development application lapsed in March 2008.

3.9.6 Green Energy Park and Rocky Point Ethanol Plant upgrade

The Heck Group, owners and operators of the Rocky Point mill and ethanol distillery, are proposing a major upgrade of the distillery. The current annual production capacity of 4 million litres of ethanol will be increased to 15 million litres. The development application for the upgrade was lodged in September 2007.

The plant will also be upgraded to a dual feedstock operation with the flexibility to process both grain and cane (molasses). The upgraded plant will be capable of producing four different ethanol products comprising fuel, pharmaceutical, industrial and potable ethanol. The current delivery program envisages commissioning of the upgraded distillery by the end of 2008.

The Heck Group has also suggested that the Rocky Point mill, distillery and associated energy cogeneration plant could provide the focus for a green energy park, which could attract synergistic research and development activities in the fields of green energy,
lightweight materials manufacture and human resource training complementary to the other potential growth industries in the marine and aviation sectors within the study area.

### 3.9.7 Gainsborough Greens residential development

Mirvac Group and City Pacific Limited received approval for a material change of use for a major residential development on the 366 hectare Gainsborough Greens site (shown on Map 3.9) in November 2007. The western portion of the development is outside the Urban Footprint.

The approval is for a master-planned residential community comprising approximately 1900 dwellings in a variety of configurations integrated with the existing Gainsborough Greens golf course, which will be significantly upgraded.

### 3.9.8 Ormeau development proposals (Gainsborough Greens expansion)

A development application on a 123 hectare site immediately adjacent to and west of the Gainsborough Greens development owned by Mirvac Group and City Pacific Limited has also recently been approved. The development site is dissected by the Brisbane–Gold Coast railway line and is adjacent to a site that is being preserved by Queensland Transport as a Future Public Passenger Transport Facility. The eastern portion of the development site is outside the Urban Footprint.

Combined with Gainsborough Greens, the development proposal will provide a master planned residential community of around 2900 dwellings. The development proposes 992 residential dwellings including a medium density precinct adjacent to the preferred future railway station site. A separate application has also been lodged seeking approval for a shopping centre on that portion of the site west of and adjacent to the preferred future railway station site.

### 3.9.9 Coomera Waters expansion

Coomera Waters Village and Resort Pty Ltd lodged an application in June 2005 for several additional phases of expansion of the Coomera Waters residential development. In June 2007 the application was amended to an application for a development permit for a material change of use for Phases 3 and 4 only.

These phases comprise two sites with a combined area of approximately 133 hectares, and are proposed to yield 236 residential lots. Both sites are located in the Regional Landscape and Rural Production Area land use category under the SEQ Regional Plan.

The applicant requested the application be assessed under the superseded planning scheme. Gold Coast City Council advised that the application would be assessed under the current scheme. The applicant is required to respond to a referral coordination information request, which was made on 26 November 2007.

### 3.9.10 Goldmine Road, Ormeau

The owners of approximately 200 hectares of land north of Goldmine Road and adjoining the Brisbane–Gold Coast railway lodged a submission with the Department of Infrastructure and Planning in April 2008, seeking that the site, which is currently in the Regional Landscape and Rural Production Area regional land use category under the SEQ Regional Plan, be included in the Urban Footprint.

The site is mainly good quality agricultural land and large areas are subject to flooding. A preliminary flood investigation commissioned by the owners suggests that, with appropriate filling and compensatory earthworks and other flood mitigation works, approximately two-thirds of the site (132 hectares) could be made suitable for development. The submission suggested that the preferred disposition of land uses might comprise industrial/commercial
(similar to the Metropole development in Brisbane) on approximately 86 hectares in the north adjacent to the Yatala Enterprise Area, and residential development on approximately 45 hectares (including 9 hectares already in the Urban Footprint) in the southern portion of the site adjoining Goldmine road. Open space/drainage corridors based on the existing creeks on the site would separate the two uses.

The submission notes that the site has good access and proximity to infrastructure including a proposed school at Ormeau (see section 6.7), and is separated from the balance of the Regional Landscape and Rural Production Area in the study area by the proposed intra-regional transport corridor (see section 6.2).

3.9.11 West Jacobs Well

Walker Corporation, through their consultants Buckley Vann, lodged a submission in May 2008 requesting that a parcel of land of approximately 28 hectares situated just west of the village of Jacobs Well be considered for inclusion in the Urban Footprint regional land use category.

The land is triangular in shape, generally flat and cleared of vegetation and is situated between Stapylton Jacobs Well Road and Pimpama Jacobs Well Road. The land is included in the rural domain in the Gold Coast City planning scheme, although the northern portion of the site is included in the village land use theme in the planning scheme strategy.

Parts of the existing Jacobs Well village lie to the north and east of the site, land to the south is agricultural in nature and the adjoining land to the west is occupied by a sand extractive industry that is within a key resource area identified under State Planning Policy 2/07: Protection of Extractive Resources. The submission notes that areas close to the site are already subject to significant extraction, which is understood to be at the end of its life.

The submission identifies a number of grounds in support of the request including:

- the land is not good quality agricultural land
- continued extraction of the sand resource east towards the site is not viable or feasible
- the land can be developed in compliance with council requirements for flood affected areas
- the land can be adequately serviced with water, sewerage and wastewater, and can be accessed from existing roads without imposing major impacts on the existing traffic system
- the land is well situated with respect to local facilities and services at Jacobs Well and would be an orderly extension to and ‘rounding off’ of the Jacobs Well village.

3.10 Strategic significance of the site

As described in section 3.3, the North East Gold Coast study area has a number of important intrinsic values and attributes. These include good quality agricultural land and extensive deposits of hard rock and sand, in addition to the provision of a wide range of other ecosystem services.

However the study area is also significant from a regional perspective. Much of this significance derives from its strategic location between the two major urban areas of the region—Greater Brisbane and the Gold Coast. This has been recognised in the SEQ Regional Plan, which identifies the non-urban parts of the study area as a key inter-urban break and includes them in the Regional Landscape and Rural Production Area regional land use category.

The area’s role as an inter-urban break is directed at achieving a number of the strategic directions for South East Queensland set out in the SEQ Regional Plan. Maintaining inter-urban breaks promotes more efficient use of developable land within the Urban Footprint, and assists in defining the extent and character of regional communities both small and large. In the context of the North East Gold Coast, this ensures a diversity of communities ranging
from the small coastal village of Cabbage Tree Point to the emerging major urban community and town centre at Coomera.

The inter-urban break acts to limit development pressures on the coastal environment—a key objective of the SEQ Regional Plan. This is particularly significant for the North East Gold Coast study area because it is adjacent to the fragile ecosystems of southern Moreton Bay. Limiting the spread of development along the coast is also consistent with the SEQ Regional Plan’s strategic objective to encourage a higher proportion of infrastructure-led, new development in the Western Corridor.

As shown in Table 3.10, the aggregate resident population of the southern Brisbane metropolitan area (taken to be Brisbane and Logan cities for the purposes of this analysis) and Gold Coast City is projected to grow by 25 per cent from 1 712 926 in 2007 to 2 136 851 in 2026. Most of this population growth will occur in Gold Coast City, which is predicted to increase by 237 000 people or 45 per cent by 2026. Almost two-thirds of the new dwellings required to accommodate this population growth are expected to be provided through infill and redevelopment of existing urban areas to promote accessibility to employment, transport and other services.

Table 3.10—Projected population growth

<table>
<thead>
<tr>
<th></th>
<th>ERP (June 2007)</th>
<th>ERP (June 2026)</th>
<th>Change in ERP 2007 to 2026</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>Brisbane City</td>
<td>1 007 901</td>
<td>1 164 095</td>
<td>156 194</td>
</tr>
<tr>
<td>Logan City</td>
<td>180 358</td>
<td>210 233</td>
<td>29 875</td>
</tr>
<tr>
<td>Gold Coast City</td>
<td>524 667</td>
<td>762 523</td>
<td>237 856</td>
</tr>
<tr>
<td>Sub-total</td>
<td>1 712 926</td>
<td>2 136 851</td>
<td>423 925</td>
</tr>
<tr>
<td>SEQ Region</td>
<td>2 770 500</td>
<td>3 843 898</td>
<td>1 073 398</td>
</tr>
</tbody>
</table>

Notes: ERP—Estimated Resident Population; Data is provided for pre-March 2008 local government areas; 2026 data from 2006 Medium Series population projections.
Source: Planning Information and Forecasting Unit, Department of Infrastructure and Planning.

As the region continues to grow, non-urban areas that are strategically located close to major urban areas will become increasingly important for their potential to provide:
- recreational and other ecosystem services for the large and growing urban population
- sites for land intensive activities (such as showgrounds, nurseries, equestrian activities, aviation facilities etc.) that are required to replace equivalent activities relocating from more accessible, high-value areas within the Urban Footprint
- sites to accommodate new activities required to meet demand from the growing regional population.

The provision of land for sub-regional and regional scale sporting purposes (flat unencumbered land of between 10 and 50 hectares) is increasingly difficult within the Urban Footprint. Rapid population growth is driving the demand for new facilities well in advance of supply. As the sub-region’s growth advances up to and over one million people there will be increasingly significant shortfalls in the provision of these important community facilities. The study area, because of its availability of land, generally flat terrain and flooding constraints to other forms of development, provides some of the few remaining opportunities for the long term provision of facilities of this nature.

The North East Gold Coast’s locational and other attributes mean that it is particularly well-suited to providing a range of ecosystem services, including outdoor recreation, for a large regional population. The planning challenge is to preserve the area’s capacity to meet these future demands while at the same time providing economic and lifestyle opportunities for existing residents and land owners.
3.11 Summary of key study area issues

The study area contains good quality agricultural land and extractive resources that are identified in State Planning Policies as being of state or regional significance.

The study area also provides a wide range of other ecosystem services—for example, outdoor and active recreation, floodplain storage, fisheries habitats and scenic amenity.

The significant habitat areas in the study area should be protected and enhanced, including allowing for improved management of surrounding land uses. The priority habitat areas include:

- conservation parks
- Pimpama River conservation area
- McCoys Creek catchment
- tidal wetlands, sand flats, saltpan, mudflats and salt marsh
- waterway corridors
- Coomera–Pimpama koala conservation area
- representative eucalypt forest.

A regional ecological corridor along the Hotham Creek, Pimpama River and McCoys Creek corridors should be protected, and over time restored and enhanced.

Koala habitat in the Pimpama River conservation area and the McCoys Creek catchment should be protected and restored. In particular, any conflicts between the values and intent of the koala conservation area and the land use designations and infrastructure servicing intent in the Gold Coast City planning scheme should be removed when the planning scheme is reviewed.

The connectivity between remnant habitat areas should be protected and enhanced. Priority areas include:

- the Moreton Bay coastline corridor
- remnant vegetation areas in the Pimpama Creek and McCoys Creek corridors and catchments.

Flooding poses a significant constraint to development over large parts of the study area. Although the flood modelling includes an allowance for the impacts of climate change on sea levels, the uncertainty around these impacts means it is prudent to take a precautionary approach when considering future land uses in areas that are potentially subject to flooding.

The study area includes extensive areas of acid sulphate soils. Future land uses should avoid or minimise the disturbance of these wherever practicable.

There are only limited areas of bushfire and landslip hazard, generally within the Urban Footprint. These hazards are not significant for strategic planning purposes.

Preventing inappropriate development in areas identified as having regionally significant scenic amenity values, as well as areas adjacent to the canelands tour scenic road route and the Albert/Logan river scenic water route, can protect important scenic amenity values in the study area.

Eagleby is the only location in the study area that exhibits a high level of socio-economic disadvantage. Eagleby would benefit from improved access to employment and training opportunities.

The i-METT development proposal is subject to a separate formal assessment process under the State Development and Public Works Organisation Act 1971 and cannot be evaluated as part of this strategic planning study.
Current and recent development proposals for extractive industry have highlighted the need to identify an appropriate balance between the requirement to protect good quality agricultural land and to ensure extractive resources are made available to meet the demands of the construction industry in South East Queensland.

The Urban Footprint boundary along the southern portion of the study area should be reviewed to ensure consistency with the existing and likely future extent of urban development.

The non-urban parts of the study area provide a strategically significant inter-urban break between greater Brisbane and the Gold Coast. These are the region’s two largest urban areas and both are forecast to grow strongly at least until 2026.
4 Planning context

4.1 Global issues (climate change and energy)

4.1.1 Climate change

The available scientific evidence overwhelmingly indicates that climate change is happening and is a serious global threat. The Intergovernmental Panel on Climate Change (IPCC) provides the most authoritative scientific information on the topic.

The IPCC Fourth Assessment Report (Alley et al, 2007) found that most of the observed increase in globally averaged temperatures since the mid 20th century is very likely (greater than 90 per cent probability) due to the observed increase in greenhouse gas concentrations caused by human activity, and that the rates of observed warming and sea level rise have accelerated during the past century.

The Queensland Government is committed to playing its part in achieving the current national greenhouse gas emissions target of 60 per cent below 2000 levels by 2050, and has adopted ClimateSmart 2050 as the long-term strategy to secure a clean energy future for Queensland.

ClimateSmart 2050 provides a summary of the best available climate change projections for Queensland (developed by the CSIRO using sophisticated computer based models for global climate, and scenarios of future global greenhouse gas and aerosol emissions). The projections (relative to 1990 conditions) indicate the following:

- higher temperatures—average annual temperature increases of 0.4–2 degrees Celsius by 2030, and 1–6 degrees Celsius by 2070, with the greatest warming in inland areas
- a tendency for less rainfall with fewer but heavier rainfall events and more droughts anticipated
- a rise in global average sea level of 8–88 centimetres by 2100 with regional differences (Note: an on-line report in Nature Geoscience, 16 December 2007, reported recent research that suggests that sea level rises due to climate change may be as much as 1.6 metres by 2100)
- increased risk of storm surges along Queensland’s coast—for example, an expected 1-in-100-year storm surge in Cairns becoming a 1-in-55-year event by 2050.

ClimateSmart 2050 sets out a range of long-term strategies across a number of key sectors including energy, industry, community, planning and building, primary industries, transport and government leadership. In the context of this study some of the key actions to date are:

- A range of methods are being used to protect vulnerable coastal areas, including the State Coastal Management Plan to ensure that development does not expand or become more intensive in vulnerable coastal areas, provision of funding to local councils to undertake storm tide inundation mapping and assist in the preparation of shoreline erosion management plans, and installing an array of storm tide gauges and wave buoys to provide real time information.
- A commitment by the government in 2006 mandates a blend of 5 per cent ethanol in all petrol produced in Queensland by 2010, supporting the government’s Ethanol Industry Action Plan to develop Queensland’s ethanol industry.
- A legislative framework for the ownership and registration of rights to trees and carbon, and the separation of those rights from the land on which the trees are planted, have been created. This allows plantation growers to rent another person’s land for tree cropping and gives growers the capacity to get a return through the supply of carbon offsets, which will help to make long-rotation plantations a more attractive investment.
Proposed future initiatives under *ClimateSmart 2050* include:

- A State Planning Policy for climate change will be developed to ensure climate change issues are incorporated into planning schemes and development assessment.
- The government has developed a policy framework for the use of environmental offsets (currently excludes carbon) to compensate for any unavoidable negative environmental impacts of development. The government is also establishing an offsets exchange facility called Green Invest as a mechanism to assist developers to fund offsets for vegetation clearing. Both tools have the potential to facilitate carbon offsetting arrangements.

The study area contains significant areas of land that were cleared of native vegetation before 1990. As such there is potential for carbon sequestration in the area at around 400 tonnes per hectare (Michael Whitehead, E3s Sustainability 2008). The extent of the area suitable for carbon sequestration (8000 hectares) makes it potentially significant. However, given the current status of carbon sequestration policy at both state and federal levels, the emergence of carbon sequestration as a significant land use option is unlikely in the short- to medium-term.

Complementing *ClimateSmart 2050* is *ClimateSmart Adaptation 2007–2012*—a five-year plan that sets out the first steps in building Queensland’s resilience to climate change.

Based on the CSIRO projections, ClimateSmart Adaptation notes that South East Queensland could face major challenges as a result of drier conditions overall, a rise in sea level, increased coastal development and rapid population growth.

The action plan in *ClimateSmart Adaptation* includes the following actions:

- Prepare a climate change vulnerability assessment of Queensland’s regions and sectors.
- Ensure regional planning activities under the *Integrated Planning Act 1997*, including the 2010 review of the SEQ Regional Plan, draw together state and local government responses to climate change.
- Incorporate changes in flood risk due to climate change in the proposed *State Flood Risk Management Policy*, local government floodplain management plans and relevant state guidelines.
- Review the effectiveness of existing planning tools in addressing the increased risks from climate change, including the *State Planning Policy 1/03: Mitigating the Adverse Impacts of Flood, Bushfire and Landslide, State Coastal Management Plan*, and local government planning schemes.

### 4.1.2 Energy, peak oil and ethanol

Oil is essential to the daily functioning of modern society. It is the basic ingredient in many products, including pharmaceuticals, agricultural fertilisers, plastics, paints and many other products (Hirsch, 2005). It fuels the vast majority of the transportation system and supports our mechanised agricultural and industrial needs (Australian Bureau of Agricultural and Resource Economics, 2003). Nevertheless, world oil production is predicted to peak within 20 years (Hirsch, 2005; Robinson, 2004; Powell, 2001).

According to the Australian Academy of Technological Sciences and Engineering (2007), Australia’s oil production is falling due to the depletion of reserves, with the rate of discovery of new oil reserves not keeping up with production. Accordingly, Australia needs to adopt a number of strategies. The academy believes that industry must be encouraged to explore for remaining Australian oil deposits (particularly in new frontier areas), diversify the sources of liquid fuel supply and/or attempt to mitigate demand.

In the case of petroleum-based transport fuels, it will be necessary to manage a transition to a larger, mixed economy in which liquid fuels are derived from a number of sources.
There are a number of government initiatives from the previous Commonwealth Government intended to contribute to the development of a biofuels (bioethanol and biodiesel) industry in Australia. These include:

- the payment of production grants of 38.143 cents per litre for fuel ethanol and biodiesel. These arrangements ensure that the effective rate of excise for biofuels is zero until 1 July 2011
- capital grants for projects that provide new or expanded biofuels production capacity (including $2.4 million to Rocky Point mill)
- a 50 per cent discount to alternative fuels entering the excise net under the recent reforms to the fuel excise system
- the establishment of the Ethanol Distribution Program. This program provides grants to encourage the development of facilities at services stations to sell ethanol blended petrol.

Ethanol is currently produced in Australia from either sugarcane, generally using molasses as a feedstock, or from grain and grain residues. Ethanol's use as a fuel in Australia is small. There is a statutory limit of 10 per cent by volume, introduced in 2003. It is now available in Australia as a petrol blend in some locations, most visibly marketed by BP Australia. A number of independent petrol retailers also sell ethanol blends.

The previous Commonwealth Government announced a biofuels target of 350 megalitres per year by 2010, which would be about 0.75 per cent of Australia’s expected oil consumption by 2010 of 800 000 barrels per day. The Biofuels Taskforce reported that proposed ethanol projects other than those of the three current commercial producers (Manildra, CSR and Rocky Point mill) could theoretically increase ethanol production to 1005 megalitres by 2010. This falls short of the quantity required to meet a 10 per cent ethanol target.

However it is doubtful whether these levels of production could be attained reliably using grain or sugar by-products. For example, during the recent drought, Australia needed to import grain to offset a national wheat shortage due to crop failure and will have to buy wheat on the international market to honour export contracts.

Production of ethanol from cellulose (or lignocellulose), while not yet proven on a large commercial scale, offers the potential to greatly increase ethanol production and improve the return on energy invested. A submission from an Australian research company, Microbiogen, argued that the sugar industry alone produces sufficient quantities of lignocellulose in the form of bagasse to produce enough ethanol to replace at least 10 per cent of the Australia’s oil consumption.

The Biofuels taskforce appears to consider that lignocellulose technology has the potential to make traditional ethanol technologies based on sugar by-products and grain redundant, hence its warning to ‘consider carefully’ new policy interventions to assist investment in production from current technology.

Like most of the rest of the developed world, Queensland is highly dependent on oil, particularly as the energy source for most passenger and freight transport activities. In May 2005, the Queensland oil vulnerability taskforce was established to report on Queensland’s vulnerability to rising world oil prices driven by supply constraints including the potential peaking of world oil supplies caused by natural oil field decline (peak oil).

The taskforce reported in early 2007 (Queensland’s Vulnerability to Rising Oil Prices, April 2007), concluding that Queensland’s vulnerability to the peaking of world oil supplies and to world supply disruptions, is particularly acute due to the state’s regionally distributed population and industrial base.
The recommendations in the report are preliminary due to the need for more detailed analysis and modelling of the downstream impacts and substitution effects of alternative energy technologies. Some of the report’s key recommendations in the context of this study area as follows:

- The government should promote and support both domestic and commercial development and application of renewable energy sources, including solar, geothermal, biofuels and hydrogen systems.
- In relation to ethanol, the report concluded that ‘ethanol is a fuel extender in petroleum, important for its potential to maintain some oil market elasticity in Australia. However, its role in substitution is limited at this time but has some unquantified potential to increase in the future’.
- Town planning (involving the explicit adoption of the principles of new urbanism, walkability, connectivity, in-fill, and higher density residential living) and the abandonment of support for urban sprawl will be a key policy tool. The protection of not just green space but agricultural land in and around our major population centres will be a key determinant of food costs and liveability.

4.2 South East Queensland Regional Plan

The South East Queensland Regional Plan 2005–2026 (SEQ Regional Plan) provides the framework for managing growth and development in the SEQ region to 2026.

The SEQ Regional Plan is the pre-eminent plan for the SEQ region and takes precedence over all other planning instruments. Under the Integrated Planning Act 1997 (the IPA), the SEQ Regional Plan prevails where there is any inconsistency with any other plan, policy or code, including any other planning instrument made under state legislation, that have effect within the SEQ region. Any plans, policies and codes that relate to the SEQ region being prepared or amended by state agencies must reflect and align with the SEQ Regional Plan.

The SEQ Regional Plan establishes a number of strategic directions to manage growth in SEQ. There are four strategic directions that are relevant in the context of this study:

- protecting and supporting regional landscape and rural production values
- enhancing the identity of regional communities
- facilitating growth in the Western Corridor
- supporting rural futures.

Protecting and supporting regional landscape and rural production values

The rural and natural landscape areas of SEQ support many environmental, rural production, recreational, cultural and scenic features that are highly valued by the region’s population. These natural environment and economic resources underpin the region’s liveability, form a substantial component of the economy, and will be protected from urban development and rural residential subdivision.

Enhancing the identity of regional communities

Emphasis is placed on building strong and well-serviced communities, with distinct local character and identity. Growing urban areas will be contained and framed by the Regional Landscape and Rural Production Area to preserve key inter-urban breaks—defining the extent and character of regional communities. These inter-urban breaks range in scale from a separation of the Brisbane metropolitan area and the Gold and Sunshine Coasts, to smaller inter-urban breaks defining local settlements. The preferred structure also encourages consolidating growth within and immediately adjacent to rural townships.
Facilitating growth in the Western Corridor
An increased proportion of the region's future population will be accommodated in the Western Corridor, making use of significant areas of available land and reducing pressure on the coast. Future growth in this corridor also provides the opportunity to achieve a good relationship between employment, transport infrastructure and population growth. By identifying areas for future urban development and giving priority to infrastructure and services, increased economic and population growth can be attracted to the Western Corridor.

Supporting rural futures
The SEQ Regional Plan identifies 80 per cent of the region as a Regional Landscape and Rural Production Area. While a proportion of this area comprises protected national and conservation parks, water storage and state forests, the majority is privately-owned farmland and contributes significantly to the regional economy. Not all land is good quality productive land and there are particular difficulties where water accessibility is limited and in areas adjacent to urban development. The SEQ Regional Plan proposes policies to help rural communities, towns and villages remain viable.

The SEQ Regional Plan uses four regional land use categories to define the regional land use pattern. Map 4.2 shows the regional land use pattern within the study area. Only two of the regional land use categories are found within the study area.

The study area is predominantly included in the Regional Landscape and Rural Production Area which identifies lands that have regional landscape, rural production or other non-urban values, and protects these areas from encroachment by inappropriate development, particularly urban or rural residential development.

The Urban Footprint identifies land to provide for the region’s urban development needs to 2026. Land around the fringes of the study area is designated Urban Footprint including the predominantly residential area of Eagleby, industry and future industry areas at Stapylton (part of the Yatala Enterprise Area), rural residential areas at Ormeau and Pimpama, the Gainsborough Greens golf club and adjacent rural residential area, and along the coast at Jacobs Well/Calypso Bay marina and canal estate, and at Cabbage Tree Point/Horizon Shores marina.

Through the allocation of these regional land use categories, the SEQ Regional Plan has clarified that the non-urban parts of the study area are not intended for broad-scale urban development within the planning horizon of the regional plan (i.e. currently to 2026), and possibly beyond that horizon as the SEQ Regional Plan also includes a number of major investigation areas for urban development beyond 2026 in Caboolture, Ipswich and North Beaudesert (now Logan City) that effectively establish the desired directions for urban growth beyond 2026.

The SEQ Regional Plan’s regulatory provisions apply to the Regional Landscape and Rural Production Area, and restrict further fragmentation of land holdings, urban development (except within established villages) and expansion of rural residential development.

The regulatory provisions generally prohibit subdivision that would create a lot or lots less than 100 hectares in area in the Regional Landscape and Rural Production Area. However, Gold Coast City Council has been granted an exemption to this requirement so that the minimum lot size of 20 hectares in the Gold Coast City planning scheme applies to the good quality agricultural land (the cane land) within the study area.

The regulatory provisions make a material change of use for an urban activity in the Regional Landscape and Rural Production Area an impact assessable development, for which the Department of Infrastructure and Planning is a concurrence agency. Urban activity is defined to exclude a range of uses including extractive industry, an aeronautical facility, an emergency services facility and various types of infrastructure facilities, a cemetery or crematorium, a wholesale nursery and an animal boarding facility.
However, the regulatory provisions allow certain types of urban activity in the Regional Landscape and Rural Production Area including small scale sport and recreation activities; small scale uses catering for local demand; uses that have a direct connection with the rural, natural or resource value of the surrounding area; and where the locational requirements or environmental impacts of the proposed use necessitate its location outside the Urban Footprint and there is an overriding need for the proposed use in the public interest.

The SEQ Regional Plan identifies Steiglitz as an economic activity centre for investigation as follows:

*This area has potential to develop as a marine industry precinct, similar to the successful Gold Coast Marine Precinct at Coomera. Coomera is now almost at capacity, and the area at Steiglitz has the potential to provide expansion of this valuable industry sector.*

*Studies will determine how much land is needed to facilitate expansion of this industry, together with any supporting infrastructure and services requirements. It will also need to assess the practicality of marine access and potential impacts on the local natural environment and natural resource values. On current indications and subject to the outcome of these investigations, a marine industry precinct could be expected to commence by 2010.*

Desired Regional Outcome 2 of the SEQ Regional Plan outlines principles and policies to ensure the protection and management of the natural environment. Areas of state significance should be protected and buffered from development consistent with SEQ Regional Coastal Management Plan policies.

The SEQ Regional Plan is supported by the South East Queensland Infrastructure Plan and Program (SEQ Infrastructure Plan), which is updated annually. The current version covers the period 2008–2026. The SEQ Infrastructure Plan is linked to the annual state Budget process and is the principal mechanism for identifying, prioritising and delivering infrastructure projects to support the SEQ Regional Plan outcomes.

The priorities for infrastructure investment are based on key strategic directions from the SEQ Regional Plan including promoting the achievement of a more compact urban form, encouragement of development in the Western Corridor, and promoting sub-regional self-containment.

Given these strategic directions and the fact that most of the study area is within the Regional Landscape and Rural Production Area, the only regionally significant project within the study area is the northern component of an intra-regional transport corridor between Nerang and Stapylton, for which it is intended to undertake corridor preservation works only during the period to 2026. Chapter 6 of this report provides more information on the existing and planned infrastructure within the study area.

### 4.3 State Planning Policies

The study area is affected by four State Planning Policies (SPPs). Local governments, the Planning and Environment Court and the state government are required to have due regard to SPPs when carrying out their planning functions. The following sections summarise the key elements of these SPPs.

#### 4.3.1 SPP 1/92: Development and the conservation of agricultural land

SPP 1/92 addresses the conservation of good quality agricultural land and provides guidance on how this issue should be addressed when preparing regional plans, planning schemes and undertaking development assessment.

The policy was developed in recognition of agricultural production as one of the most important components of the national and state economies. The policy notes that world
markets and economic factors create cycles of prosperity interspersed with periods of difficulty for agriculture. Economic downturns and particular crop surpluses should not obscure the fact that productive land provides the long term basis for an efficient and flexible agricultural industry that can be responsive to changing demands for products and which generates community wealth through income and employment. This is now even more important with the issues of climate change and energy costs that have emerged since the preparation of the SPP in 1992.

An underlying theme of planning policy is the control of land use and development in the public interest. Local governments are increasingly being called upon to weigh most carefully the balance between development and conservation. There will clearly continue to be a need to build on previously undeveloped land and some loss of agricultural land to development is inevitable.

In South East Queensland, the expansion of urban development onto some areas of agricultural land is provided for within the Urban Footprint. Nevertheless, development without regard to the need for land conservation and the continuing importance of agriculture would be unacceptable. Agricultural land is a valuable resource that should, in general, be protected from irreversible development.

The SPP 1/92 includes the following principles that are applicable to the North East Gold Coast study area:

- Good quality agricultural land has a special importance and should not be built on unless there is an overriding need for the development in terms of public benefit and no other site is suitable for the particular purpose.
- The alienation of some productive agricultural land will inevitably occur as a consequence of development but the government will not support such alienation when equally viable alternatives exist.
- When preparing, reviewing or amending planning schemes, local governments will be expected to include provisions for the conservation of good quality agricultural land, regardless of the effect of market fluctuations on its viability.
- The fact that existing farm units and smallholdings are not agriculturally viable does not in itself justify their further development for non-agricultural purposes.
- Local government planning provisions should aim to minimise instances of incompatible uses locating adjacent to agricultural operations in a manner that inhibits normal farming practice. Where such instances do arise, measures to ameliorate potential conflicts should be devised wherever possible.

Areas of good quality agricultural land for the study area are shown on Map 3.3. These areas of good quality agricultural land include land suitable or marginal for sugarcane as identified by the Department of Infrastructure and Planning utilising land suitability information by the Department of Natural Resources and Water, the state government agency responsible for providing technical advice on the SPP 1/92. This map is based on recent mapping of land suitability, which has reduced the areas of suitable and marginal land as a result of more recent data on salinity and acid sulphate soils. The current mapping varies from that shown in the Gold Coast City Council planning scheme, which identifies good quality agricultural land on overlay map OM 2 (see section 4.5).

The Department of Natural Resources and Water is currently undertaking a review of the SPP 1/92. The review is expected to be completed in 2009.

### 4.3.2 SPP 1/03: Mitigating the adverse impacts of flood, bushfire and landslide

SPP 1/03 sets out the state’s interest in ensuring that the natural hazards of flood, bushfire and landslide are adequately considered when making decisions about development. The SPP requires the identification of natural hazard management areas within which minimising risks to the community should be a key consideration in development assessment and the making of planning schemes.
The SPP also aims to ensure that certain important types of community infrastructure are able to maintain operation during and immediately after natural hazard events wherever practicable.

The SPP sets out the Queensland Government’s position that, generally, the appropriate flood event for determining a natural hazard management area for flood hazard is the 1 per cent AEP (Annual Exceedance Probability) flood event, which is also referred to as the 1:100 year (or 100 year) flood event.

The Gold Coast City planning scheme reflects SPP 1/03, and is therefore regarded as the local interpretation and expression of the SPP for development assessment purposes.

The planning scheme includes three overlay maps identifying the natural hazard management areas and associated constraint codes that apply to development on land identified on the relevant overlay map. The codes are based on the advice in SPP 1/03, and set out the required performance criteria and acceptable solutions to achieve the outcomes required under the SPP. These maps and codes are as follows:

- Overlay map OM10—Potential bushfire management areas and the bushfire management area constraint code
- Overlay map OM 16—Areas of unstable soils and areas of potential landslip hazard and the steep slopes or unstable soils constraint code
- Overlay map OM 17—Natural hazard (flood) management areas and the flood affected areas constraint code.

These constraints to development are mapped and described in more detail in section 3.5. (Note that the flood information presented in section 3.5 is more recent than that presented in overlay map OM 17.) In view of the significant flooding constraint within the study area, it is useful to consider both the policy position in SPP 1/03 as well as the flood code in the Gold Coast City planning scheme in relation to flood hazard considerations when allocating future land uses.

The SPP 1/03 guideline says that, where practicable, land use strategies should give preference to future land uses that maintain people’s safety, minimise the potential damage to property and maintain the function of essential services infrastructure. Public safety should be the main consideration in seeking to achieve these outcomes, with planning strategies devised to achieve optimum levels of safety within the planning scheme area.

In general, land use strategies that do not increase the number of people living or working in natural hazard management areas are preferable. In particular, uses such as residential development that are likely to materially increase the risks to life or personal property should be discouraged in areas of high or medium hazard severity, unless the planning scheme includes clear requirements or standards aimed at ensuring that appropriate levels of safety will be achieved.

4.3.3 SPP 2/02: Planning and managing development involving acid sulfate soils

SPP 2/02 sets out the state’s interests concerning development involving acid sulfate soils in low-lying coastal areas. The SPP requires development in low-lying coastal areas involving acid sulfate soils to be planned and managed to avoid potential adverse effects on the natural and built environment (including infrastructure) and human health.

SPP 2/02 applies to all land, soil or sediment at or below 5 metres AHD where the natural ground level is below 20 metres AHD, including Gold Coast City Council.
The SPP applies to development that would result in:

- the excavation of, or otherwise removing, 100 cubic metres or more of soil or sediment
- filling of land involving 500 cubic metres or more of material with an average depth of 0.5 metres or greater.

Acid sulfate soils occur naturally over extensive low-lying coastal areas, predominantly below 5 metres AHD. These soils may be found close to natural ground level but may also be found at depth in the soil profile. Typically, excavating or otherwise removing soil or sediment, extracting groundwater or filling land causes disturbance of acid sulfate soils. These activities can be an intrinsic part of land uses such as canal estates, high-rise residential units, golf courses, sand/gravel extraction, aquaculture and roads and other infrastructure.

Acid sulfate soils only become a problem when they are disturbed and exposed to air. When acid sulfate soils are oxidised, sulfuric acid forms and the soil becomes strongly acidic (usually below pH 4). Strongly acidic soil can mobilise the naturally occurring metals in the soil. Acid sulfate soils and any subsequent leachate can have significant adverse effects on the natural and built environment, the economy and human health due to the presence of abundant acid, iron, aluminium, manganese and possibly other heavy metals.

The potential effects of disturbing acid sulfate soils need to be addressed when planning for or undertaking development. While it is preferable to avoid disturbing acid sulfate soils, it is not the intention of the SPP to stop development because of acid sulfate soils. This is because the potential adverse effects of disturbance can be avoided or minimised by treatment and, in some cases, by ongoing management.

The SPP 2/02 guideline says that, where practicable, land use strategies should adopt the principle that avoidance is better than treatment. That is, future land uses and development requirements should avoid or minimise the disturbance of acid sulphate soils.

However, where there are compelling social, economic or other environmental arguments for favouring land uses that are likely to disturb acid sulphate soils, development will need to treat and manage those disturbances in accordance with the requirements of SPP 2/02.

### 4.3.4 SPP 2/07: Protection of extractive resources

SPP 2/07 identifies those extractive resources\(^3\) of state or regional significance where extractive industry development may be appropriate in principle, and aims to protect those resources from developments that might prevent or severely constrain current or future extraction when the need for the resource arises.

The SPP 2/07 identifies the location of such extractive resources as key resource areas (KRAs), each of which contain three elements—a resource/processing area, a separation area and an associated transport route (which also includes a transport route separation area) where such a link is needed from the resource/processing area to a major road or railway. These areas are shown on Map 3.3.

The resource/processing area generally identifies the location of the extractive resource itself. The adjoining separation area identifies the area that may be affected by the residual impacts of existing or future extractive operations in the resource/processing area, and also provides a buffer between those operations and any incompatible uses beyond and adjoining the separation area.

SPP 2/07 seeks to ensure that as far as practicable, development within a resource/processing area, the separation area of a KRA and the associated transport route’s separation area are compatible with existing or future extractive industry.

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\(^3\) Extractive resources include sand, gravel, quarry rock, clay and soil and are used in concrete, asphalt, road bases and a range of other products.
The SPP 2/07 guideline states that extractive resources are essential to state and regional economies and the community as the primary raw materials for the construction industry. Extractive resources are used in concrete, road bases, asphalt, drainage materials, mortar and plaster and a range of other products.

Extractive resources are high volume, low value products, and the economic viability of an extractive resource depends on its proximity to markets and urban areas. Encroachment by incompatible development can restrict or prevent the extraction, processing and transportation of extractive resources to markets.

In addition, the SPP 2/07 guideline acknowledges that, in general, land use strategies should not increase the numbers of people living in key resource areas and, in particular, strategies should focus on not increasing the number of people living in the separation area for the resource/processing area or the transport route’s separation area.

Planning strategies should also seek to ensure that extractive industry development does not compromise the function of the separation area in providing a buffer between extractive/processing operations and any incompatible uses outside the separation area.

### 4.4 Gold Coast City Council Local Growth Management Strategy

The Gold Coast City Council prepared a draft Local Growth Management Strategy (draft LGMS) which was on public exhibition until 31 January 2008. The purpose of the draft LGMS is to provide detailed guidance about the preferred nature and timing of development within the Gold Coast Urban Footprint and to identify enhancements to the city’s planning scheme and other key policy documents to ensure appropriate integration of the regional plan.

Because the focus of the draft LGMS is on planning issues within the Urban Footprint, it says little of direct relevance to the study area other than to recognise the study area’s predominantly rural character and to reinforce the importance of the inter-urban break at Ormeau. However it does provide some useful information as a context for the consideration of land use issues within the study area. The key findings of the draft LGMS are outlined below.

Gold Coast City has adequate land and capacity to accommodate an additional 148,726 dwellings between 2004 and 2026 including 73,993 dwellings through infill and redevelopment. This compares favourably with the targets in the regional plan of 136,500 and 65,000 dwellings respectively, and can be achieved within the existing planning scheme provisions and regional land use category designations.

The draft LGMS identifies measures by which Gold Coast City can accommodate approximately 130,000 new jobs by 2026 with increased self-containment of employment. The growth is intended to occur primarily in regional activity centres and in economic activity centres (employment nodes) including the Yatala enterprise area, which lies partly within the north-eastern part of the study area.

The availability of land for industrial and large-scale tourism development within the Gold Coast was found to be essential to the continuing growth and prosperity of the city and region. Key implementation measures that may potentially impact on the study area include proposals to investigate the ability of the Yatala enterprise area to expand to cater for expected industry growth and to designate it a major development area under the SEQ Regional Plan, and a proposed analysis of suitable sites for future large-scale tourism developments as part of the Gold Coast Regional Tourism Infrastructure and Investment Plan.

The draft LGMS also highlighted the importance of completing investigations into the alignment and implementation of the Southern Infrastructure Corridor (Yatala to Cunningham
Highway) and into the connection of the northern end of the Intra Regional Transport Corridor (see section 6.2) into the regional and sub-regional transport network.

4.5 Gold Coast City Planning Scheme

The Gold Coast City planning scheme comprises a number of layers of increasing detail, moving progressively from high level desired environmental outcomes (DEOs) that establish the fundamental context for broad planning strategies, and subsequently to the land use domains, development assessment codes and other detailed measures that control the location and nature of development in the city.

For the purposes of this study it is important to understand the domains into which the study area is divided for the purposes of land use and development control, which is achieved predominantly through the table of development associated with each domain. The table of development sets out the assessment status of development in the area covered by the domain. Development may be classified as exempt, self-assessable, code assessable, or impact assessable. The domain provisions also identify the codes that apply to the assessment of development in the domain area.

As shown on Map 4.5, an extensive area in the south west of the study area is included in the emerging communities domain. The purpose of the emerging communities domain is to recognise that some areas provide opportunities for the logical expansion of park living and urban development. However, the extent of land suitable for such purposes is identified in structure plans adopted by council. The broad land uses shown within the emerging community domain on Map 4.5 reflect the precincts in the Albert Corridor A: Ormeau structure plan and the inter-urban break structure plan.

The study area also includes all or part of four local area plans (LAPs): Eagleby (all), Yatala enterprise area (part), Coomera (part) and East Coomera/Yawalpah (part). LAPs provide a finer grain of planning control through the use of precincts, which replace the domain controls for the area covered by the LAP.

Map 4.5 presents a composite of the Gold Coast City planning scheme domains and the precincts in the areas covered by the emerging communities domain or by LAPs. For presentation purposes, some of the precincts have been combined and/or renamed to align them with the domain names while maintaining the integrity of their strategic land use intent.

The more intensely developed western section of the study area adjacent to the M1 is included in either LAPs or structure plans within the emerging communities domain. This detailed planning approach is appropriate to the more intensely developed nature of much of this area, as reflected in its inclusion in the Urban Footprint regional land use category in the SEQ Regional Plan. Within these areas that have been subject to more detailed planning there are fringe areas that are included in precincts similar in intent to the rural domain. For example, the fringe areas within the Eagleby LAP adjacent to the Logan and Albert Rivers are in rural type precincts, as are the northern portions of the Coomera LAP.

Along the coastal boundary of the study area, the urban areas of Cabbage Tree Point and Jacobs Well are included in the village domain. Some coastal land adjacent to Cabbage Tree Point (including the Horizon Shores marina and several smaller marine industry activities) is included in the marine industry domain.

The primary purpose of the marine industry domain is to protect appropriate marine industry areas as significant investment and employment opportunities for Gold Coast City. The marine industry domain facilitates boat building and repairs and other activities which require access to a substantial body of water or a watercourse. Light marine product fabrication and fishing industry activity, including seafood processing, are also considered appropriate in this domain. Facilities that can be provided in the domain include marinas, slipways and boat storage areas.
Generally, the areas designated for urban or rural residential development in the planning scheme align reasonably well with the Urban Footprint regional land use category in the SEQ Regional Plan. However, there is an area of approximately 160 hectares immediately west of and adjoining the Yatala enterprise area which, although it is good quality agricultural land, has been included in the Urban Footprint. This land is included in the rural domain in the planning scheme but offers potential for expansion of the Yatala enterprise area. The strategic future of this land is a matter that should be addressed through this study.

The planning scheme includes specific provisions for the Driver Training Centre at Norwell and the Calypso Bay estate at Jacobs Well, which were zoned special facilities under the superseded planning scheme. These areas are included in a special facilities schedule and the planning scheme preserves the existing use rights in respect of those lots.

As shown on Map 4.5, the balance of the study area is included in other domains. The main domains and their intents are as follows:

- **Extractive industry**—The purpose of this domain is to preserve land with economically viable extractive resources for current and future needs. Given that extractive industry resources are often located in undeveloped areas of the city, this domain also seeks to achieve the protection of nature conservation values on the site.
- **Public open space**—This domain is intended to provide for the protection of land in public ownership for nature conservation, outdoor recreation, landscape preservation, environmental buffers and natural resource management and natural hazard management purposes. This domain applies to land that is intended to be retained in public ownership and maintained as open space. The more extensive areas of public open space are located at the mouths of the Logan and Pimpama Rivers and to the north and south of Jacobs Well.
- **Industry 1**—This domain seeks to accommodate large-scale industrial uses which, by reason of the process involved, the method of manufacture or the nature of the goods and materials manufactured or stored, requires that they be carefully controlled with measures including the provision of extensive buffer areas. The Rocky Point mill and ethanol distillery are included in this domain.
- **Community purposes**—This domain seeks to retain and reserve appropriate land throughout the city for community purposes and public infrastructure.
- **Conservation**—This domain seeks to provide permanent areas of land for the protection of nature conservation values on land remaining in private ownership through the conservation of wildlife and wildlife habitat areas of ecological significance. In addition, it is intended to provide for limited residential use, in association with the management of privately owned land for the purposes of nature conservation.

However, the rural domain is by far the most extensive domain in the study area. The purpose of the rural domain is to support the provision of a wide range of rural activities and legitimate rural economic activity within suitable hinterland areas while protecting nature conservation, open space and the landscape interest values of the land. This is reflected in the levels of assessment allocated to the material changes of use in the table of development for the rural domain.

This portion of the table of development is reproduced in Table 4.5A. (Note: uses not specifically listed in the table of development are considered undesirable or inappropriate in the rural domain.)
### Table 4.5A—Table of development for material change of use in the rural domain

<table>
<thead>
<tr>
<th>Exempt</th>
<th>Self assessable</th>
<th>Code assessable</th>
<th>Impact assessable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Where occurring on a site not identified on Overlay map OM2—Good quality agricultural land and not within any part of the site that may be designated as a conservation area under a statutory covenant made in accordance with the Land Titles Act 1994.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agriculture</td>
<td>Conservation (natural area management)</td>
<td>Family day care home</td>
<td>Home office</td>
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</tr>
<tr>
<td>Agricultural farm</td>
<td>Stall</td>
<td>Detached dwelling</td>
<td>Display home</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bed and breakfast</td>
<td>Bulk garden supplies</td>
<td>Caretaker’s residence</td>
<td>Community purposes</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Where occurring on a site identified on Overlay map OM2—Good quality agricultural land</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agriculture</td>
<td>Conservation (natural area management)</td>
<td>Family day care home</td>
<td>Home office</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Animal husbandry</td>
<td>Detached dwelling</td>
<td>Farm stay</td>
<td>Home occupation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bed and breakfast</td>
<td>Caretaker’s residence</td>
<td>Display home</td>
<td>Estate sales office</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Where occurring on any part of the site that may be designated as a conservation area under a statutory covenant made in accordance with the Land Titles Act 1994.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agriculture</td>
<td>Conservation (natural area management)</td>
<td>Low impact</td>
<td>Telecommunications facility</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Animal husbandry</td>
<td>Detached dwelling</td>
<td>Farm stay</td>
<td>Home occupation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bed and breakfast</td>
<td>Caretaker’s residence</td>
<td>Display home</td>
<td>Estate sales office</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: 1. Not elsewhere included

The range of uses that may be acceptable in the rural domain varies according to whether or not the land is regarded as good quality agricultural land (i.e. is included in overlay map OM2). Among the range of uses that is considered undesirable or inappropriate in the rural domain only when the land is identified as good quality agricultural land are bulk garden supplies, café, ecotourism facility, kennel, market, minor tourist facility, outdoor sport and recreation, tourist cabin and veterinary hospital.

The table of development makes development proposals for reconfiguring a lot (i.e. subdivision) impact assessable where the development would create the potential for a residential dwelling to be located within 500 metres of a lot containing a hard rock quarrying operation or resource, or within 200 metres of a sand and gravel extraction operation or resource, as defined on a constraint overlay map.

The table of development also sets out the 20 hectare minimum lot size for reconfiguring a lot in the rural domain within the study area. The current distribution of lot sizes in the rural domain is set out in Table 4.5B.
Based on the minimum lot size of 20 hectares, it would be theoretically possible to reconfigure the existing lots greater than 40 hectares in area to create an additional 55 lots in the rural domain within the study area.

**Table 4.5B—Analysis of lot sizes in the rural domain**

<table>
<thead>
<tr>
<th>Lot size</th>
<th>Area (ha)</th>
<th>No of Lots</th>
<th>Average (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;5ha</td>
<td>747.36</td>
<td>448</td>
<td>1.67</td>
</tr>
<tr>
<td>5–&lt;10ha</td>
<td>706.20</td>
<td>97</td>
<td>7.28</td>
</tr>
<tr>
<td>10–&lt;20ha</td>
<td>1671.34</td>
<td>112</td>
<td>14.92</td>
</tr>
<tr>
<td>20–&lt;40ha</td>
<td>3029.75</td>
<td>108</td>
<td>28.05</td>
</tr>
<tr>
<td>40–&lt;60ha</td>
<td>822.48</td>
<td>18</td>
<td>45.69</td>
</tr>
<tr>
<td>60–&lt;80ha</td>
<td>1029.29</td>
<td>15</td>
<td>68.62</td>
</tr>
<tr>
<td>80–&lt;100ha</td>
<td>85.16</td>
<td>1</td>
<td>85.16</td>
</tr>
<tr>
<td>100ha+</td>
<td>348.01</td>
<td>3</td>
<td>116.00</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>8439.57</strong></td>
<td><strong>802</strong></td>
<td><strong>10.52</strong></td>
</tr>
</tbody>
</table>

Notes: 1. Based on the Digital Cadastral Data Base January 2008. 2. Includes all lots in the rural domain except the Calypso Bay estate at Jacobs Well.

The 2006 Census data suggests that there are approximately 350 permanent dwellings in the rural domain. Based on an entitlement of one dwelling per lot, this means that the existing pattern of subdivision could accommodate an additional 450 dwellings, which would more than double the existing number of permanent dwellings in the rural domain.

### 4.6 SEQ Coastal Management Plan

Queensland’s coastal resources and values are protected and managed within the coastal zone under the *Coastal Protection and Management Act 1995* (Coastal Act). The *South East Queensland Regional Coastal Management Plan* (SEQ Coastal Plan) describes how the coastal zone within the SEQ region is to be managed and provides direction for implementing the *State Coastal Management Plan—Queensland’s Coastal Policy* (state coastal plan) and the SEQ Regional Plan.

The SEQ Coastal Plan aims to help manage growth and associated change along the South East Queensland coast in the most sustainable way to minimise impacts on coastal resources. The coastal resources identified in the North East Gold Coast study area and shown on Map 4.6 are:

- areas of state significance (natural resources) including significant coastal wetlands and endangered regional ecosystems (Map 8 of the SEQ Coastal Plan)
- coastal wetlands—Logan river mouth including Lagoon Island; the Loganholme–Eagleby wetland complex; Cabbage Tree Point Conservation Park; and areas of East Coomera between the northern bank of McCoys Creek and southern tip of Coomera Island; Behm Creek; Pimpama River; and Logan River estuary wetlands
- coastal forests and heathlands—forests in the McCoys Creek area
- riparian sections of waterways such as McCoys Creek and undeveloped tidal waterways such as the Logan river.

Implementation of the SEQ Coastal Plan is a key mechanism for achieving the State Coastal Plan’s and SEQ Regional Plan’s coastal management outcomes, principles and policies. The SEQ Regional Plan provides the overall strategic direction for SEQ’s development, while the SEQ Coastal Plan provides more specific direction on coastal management outcomes.

The SEQ Coastal Plan reflects key elements of the SEQ Regional Plan by:

- providing further direction on how Desired Regional Outcome 2, relating to the sustainable management of the natural environment, can be achieved
- providing direction on policies relating to the conservation of nature, managing the coast, waterways and wetlands, natural hazards, and catchment protection
identifying key regional environmental resources such as areas of state significance (natural resources), coastal wetlands, and biodiversity that are to be protected and the rehabilitation of coastal resources

informing the spatial structure of the region by identifying coastal resources and hazards that require protection and management through local government planning schemes and development assessment processes.

The SEQ Coastal Plan identifies, protects and manages the important coastal resources and values through five related components including regional policies, coastal building lines, coastal management districts, a key coastal site and resource maps.

**Regional policies**
Regional policies provide:
- direction for implementing the state coastal plan
- regionally specific coastal management issues and policy outcomes
- reference to resource maps that support regional policies, such as for significant coastal wetlands.

Regional direction is provided for 15 key policies of the state coastal plan with two additional policies provided for issues specific to SEQ. Three of the relevant coastal policy sections (2.1, 2.4 and 2.8) to this study are provided in Appendix D. Two specific policies relating to development for coastal dependent land use including marine industry precincts and extractive industry are particularly relevant to this study.

**Coastal building lines**
Coastal building lines delineate areas within coastal management districts where building work applications seaward of the coastal building line are referred to the Environmental Protection Agency for assessment under the *Integrated Planning Act 1997*. There are no coastal building lines within or adjoining the North East Gold Coast study area.

**Coastal management districts**
Coastal management districts are areas that require special development controls and management practices to protect specific features of the coastal zone that are vital to the sustainable management of the coast. Coastal management districts in the study area are shown on Map 4.7.

**Key coastal site**
A key coastal site is an area of high ecological value where an integrated planning approach needs to be developed to ensure special coastal management needs are addressed. There is only one key coastal site in SEQ, which covers the Hays Inlet and Brisbane northern wetlands.

**Resource maps**
Resource maps provide critical information for implementing the state coastal plan within the SEQ region as they identify the geographic area to which policies apply. The key coastal resources in the study area are shown on Map 4.6.

The SEQ Coastal Plan outlines that the key coastal management outcomes include ensuring canals, dry land marinas and non-tidal artificial waterways meet high environmental standards in their construction and management, protection of coastal biodiversity values from loss, degradation and fragmentation. The SEQ Coastal Plan also seeks to protect remaining coastal wetlands, ensure that public access to the coast is maintained and enhanced and ensure remaining undeveloped tidal waterways are retained in an undeveloped state.
4.7 Summary of key planning issues

Climate change is predicted to cause rises in sea level, increased risk of storm surge and fewer but more intense rainfall events—all of which increase flooding risk in low lying coastal areas such as those in the North East Gold Coast.

Climate change is expected to result in decreased rainfall, particularly in inland areas of Queensland. This suggests it would be prudent to retain productive agricultural land in higher rainfall areas closer to the coast, and particularly in areas where treated effluent can be made available for irrigation.

Recommendations to improve Queensland’s resilience to peak oil scenarios by protecting agricultural lands in and around our major population centres and by promoting renewable energy sources including biofuels such as ethanol also support the protection of the agricultural resources in the study area.

The SEQ Regional Plan includes the non-urban parts of the study area in the Regional Landscape and Rural Production Area regional land use category, and identifies it as a key inter-urban break between Brisbane and the Gold Coast. This approach underpins the strategic directions in both the SEQ Regional Plan and the SEQ Infrastructure Plan.

The extent and nature of marine industry uses at the Steiglitz Investigation Area, and elsewhere in the study area if appropriate, needs to be determined.

The study area’s good quality agricultural land and extractive resources are identified and protected by SPPs 1/92 and 2/07 respectively. Some lands in the study area contain both resources. Conflicts between the policies should be resolved by identifying priority areas for extractive industry use.

Under the guideline to SPP 1/03, land use strategies that do not increase the number of people living and working in natural hazard management areas (e.g. flood prone areas) are preferable.

The guideline to SPP 2/02 states that, where practicable, land use strategies should avoid or minimise disturbance to acid sulphate soils.

Gold Coast City Council’s draft LGMS found that Gold Coast City has adequate land and capacity to accommodate an additional 148 726 dwellings between 2004 and 2026. This is around 12 000 more dwellings than the 2026 target set out in the regional plan, and demonstrates that the non-urban parts of the study area are not required for urban residential purposes to meet projected housing demand in Gold Coast City.

The Gold Coast City planning scheme makes a number of land uses that would otherwise be acceptable in the rural domain undesirable or inappropriate development when occurring on a site identified as good quality agricultural land. This limits the range of development opportunities available to many rural landholders in the study area. Some of these land uses may be acceptable provided the impacts on the productive capacity of good quality agricultural land are appropriately limited.

The intended future use of the good quality agricultural land adjoining the western edge of the Yatala enterprise area that has been included in the Urban Footprint but retained in the rural domain in the Gold Coast City planning scheme needs to be resolved.

Future land uses in medium and high risk flood areas (assumed as areas with a predicted flood depth of >0.5 metre) should be limited to activities that have specific location requirements such as marine industry which requires a coastal location, extractive industry, or land uses that do not involve large numbers of residents or workers such as agriculture, open space or recreational activities.
The SEQ Coastal Plan requires coastal biodiversity values to be protected. Important coastal resources identified in the study area include the Loganholme-Eagleby wetland complex, marine environments at East Coomera, riparian sections of waterways such as McCoys Creek, and undeveloped tidal waterways such as the Logan River.
5 Economic development context

5.1 Gold Coast 2010: Economic Development Strategy

The Gold Coast 2010: Economic Development Strategy provides guidance for council and the community in relation to the city’s economic development. The Economic Development Strategy has been prepared in the context of the vision for Queensland as the Smart State, and aligns with the relevant principles and policies of the SEQ Regional Plan. A key economic development planning principle of the SEQ Regional Plan is to:

develop a diversified regional economy, characterised by knowledge-based, high value-adding industries that build on existing regional and sub-regional competitive advantages and specialisations.

The Gold Coast City Council’s Economic Development Strategy acknowledges that natural attractions have underpinned Gold Coast City’s high tourism and population growth, and that population based industries such as construction, retailing and service industries have been principal drivers of economic prosperity.

Population growth will continue to drive the city’s employment growth over the next 20 years. However, achieving sustainable economic prosperity in a competitive global economy will require Gold Coast to continue to diversify its economic base. The Economic Development Strategy identifies nine key industries that are crucial to the competitiveness and strength of the Gold Coast economy—including education, environment, food, health, information communication technology, marine and creative industries as well as new, higher value forms of traditional industries like sporting and tourism events.

The Economic Development Strategy includes action agendas for each of these key industries. Two of these have potential implications for the North East Gold Coast study area.

- Marine industry—a key driver of the Gold Coast economy that has enjoyed significant growth over recent years. The Gold Coast marine industry employed almost 4500 people and contributed $550 million in 2005–2006 to the Gold Coast economy. However, flooding issues are preventing full development of the planned 250 hectare Gold Coast Marine Precinct at Coomera. The Economic Development Strategy identifies the need to develop a northern marine precinct to provide additional capacity. The Steiglitz Investigation Area has been identified as an opportunity to provide this additional capacity.

- Sport industry—employed 1300 people in 2006 and contributed about $50 million to the local economy. This sector is anticipated to experience strong growth with the establishment of local teams competing in national leagues and the hosting of national sporting and related events.

The Economic Development Strategy identifies the opportunity to leverage off the city’s comparative advantages such as attractive year-round climate, strong sporting infrastructure and beaches and other natural attractions to make the Gold Coast a centre of sporting excellence. Among the actions proposed are the creation of a strategic plan for the motor sport industry and identifying opportunities for the establishment of a motor sport precinct.

The Pacific Innovation Corridor is one of Gold Coast City Council’s long-term signature economic development projects that focuses on geographical precincts to promote and develop the growth of business and economic opportunities. Each of the centres represents, or potentially will represent, a substantial aggregation or clustering of economic activity.
The Pacific Innovation Corridor comprises 10 centres, of which three are either partly within or in close proximity to the North East Gold Coast study area, providing a wide range of employment and economic development opportunities for residents and businesses within the study area as outlined below.

- **Yatala**, of which the eastern part is within the study area, is intended to be a centre for advanced design, manufacturing and distribution. Among the opportunities identified for Yatala are opportunities in boat building and other marine activities linking to the Gold Coast Marine Precinct at Coomera and the proposed expanded marine industry areas that could be accommodated within the study area. Issues affecting the continued development of Yatala relate to the need to provide infrastructure in a timely fashion to facilitate expansion. There are also concerns about industrial land supply over the longer term (see section 5.9).

- **Beenleigh**, immediately northwest of the study area, is identified as the business services centre for the developing Yatala Enterprise Area to the south, and the sugarcane lands and aquaculture industry in the North East Gold Coast study area.

- **Coomera** is approximately 4 kilometres south of the southern boundary of the study area. The Coomera Town Centre is planned as a major residential and business hub for a community expected to grow to 65,000, with employment targets of 19,793 jobs (draft LGMS 2007) over the next 25 years. The Coomera Town Centre has the potential to meet the needs of larger scale employers in newly emerging knowledge-based industries. Coomera also includes the Dreamworld theme park and the Gold Coast Marine Precinct on the Coomera River.

### 5.2 Major economic activities

Table 5.2 presents data on the number of jobs by ANZIC\(^4\) industry classification expressed in destination zones derived by Queensland Transport from ABS journey-to-work census data. The destination zones around the study area are large and were changed between 2001 and 2006, which complicates analysis and comparisons.

The combination of destination zones used for this analysis includes all of the study area except for a relatively lightly developed area south of the Pimpama River, and also includes an area outside the study area between the Pimpama and Logan Rivers west of the M1 (i.e. the localities of Yatala and Luscombe).

Eagleby was a separate destination zone in both 2001 and 2006. The balance of the total area described above was a single destination zone (Gold Coast balance in the Brisbane statistical division) in 2001. In 2006 the Gold Coast balance destination zone was divided in two along a boundary that (from north to south) follows Rotary Park Road, Jacobs Well Road, Burnside Road and Halfway Creek.

The eastern portion is called Jacobs Well-Alberton and includes most of the coastal and rural land within the study area. The western portion is called Yatala-Stapylton and includes all of the industrial and urban development areas on both sides of the M1 between the Albert and Pimpama rivers.

Total employment in the area included in these destination zones increased by 79 per cent from 5181 jobs in 2001 to 9257 jobs in 2006. Employment in Eagleby declined by 3 per cent during this period, while total employment in the area excluding Eagleby almost doubled, increasing by 95 per cent.

Employment in the Ormeau-Yatala destination zone accounted for 82 per cent (7550 jobs) of the total number of jobs in 2006, with the Jacobs Well-Alberton and Eagleby destination zones each providing around 9 per cent of total jobs.

\(^4\) Australian and New Zealand Standard Industrial Classification
The composition of employment in Eagleby changed between 2001 and 2006 with significant increases in the numbers of jobs in the government administration and defence (177 per cent increase), wholesale trade (171 per cent), and cultural and recreational services (87 per cent) sectors, and significant decreases in personal and other services (-66 per cent), communication services (-61 per cent) and agriculture, forestry and fishing (-59 per cent), although the latter sector only employed 17 people in 2001 in any case.

For the area excluding Eagleby, the main changes in employment (considering only those industry sectors with more than 200 jobs in 2006) were transport and storage (which increased jobs by 193 per cent), followed by accommodation, cafes and restaurants (191 per cent), health and community services (118 per cent), construction, manufacturing and wholesale trade (all increased by more than 100 per cent). The only industry sector that declined in employment was agriculture, forestry and fishing, in which the number of jobs declined by 34 per cent to 219 jobs in 2006.
## Table 5.2—Employment by place of work by ANZSIC industry division (number of jobs)

<table>
<thead>
<tr>
<th>ANZSIC industry divisions</th>
<th>Eagleby</th>
<th>Gold Coast balance in BSD</th>
<th>Total</th>
<th>Eagleby</th>
<th>Ormeau-Yatala</th>
<th>Jacobs Well-Alberton</th>
<th>Total</th>
<th>Eagleby</th>
<th>Total excluding Eagleby</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture, forestry and fishing</td>
<td>17</td>
<td>320</td>
<td>337</td>
<td>7</td>
<td>43</td>
<td>169</td>
<td>219</td>
<td>-59</td>
<td>-34</td>
<td>-35</td>
</tr>
<tr>
<td>Mining</td>
<td>0</td>
<td>56</td>
<td>56</td>
<td>0</td>
<td>83</td>
<td>4</td>
<td>87</td>
<td>na</td>
<td>56</td>
<td>56</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>162</td>
<td>1524</td>
<td>1687</td>
<td>141</td>
<td>3012</td>
<td>165</td>
<td>3318</td>
<td>-13</td>
<td>108</td>
<td>97</td>
</tr>
<tr>
<td>Electricity, gas and water supply</td>
<td>3</td>
<td>16</td>
<td>19</td>
<td>3</td>
<td>149</td>
<td>20</td>
<td>172</td>
<td>-5</td>
<td>971</td>
<td>809</td>
</tr>
<tr>
<td>Construction</td>
<td>81</td>
<td>577</td>
<td>658</td>
<td>60</td>
<td>1136</td>
<td>103</td>
<td>1299</td>
<td>-26</td>
<td>115</td>
<td>97</td>
</tr>
<tr>
<td>Wholesale trade</td>
<td>6</td>
<td>424</td>
<td>431</td>
<td>17</td>
<td>825</td>
<td>48</td>
<td>890</td>
<td>171</td>
<td>106</td>
<td>107</td>
</tr>
<tr>
<td>Retail trade</td>
<td>96</td>
<td>439</td>
<td>536</td>
<td>82</td>
<td>582</td>
<td>67</td>
<td>731</td>
<td>-15</td>
<td>48</td>
<td>36</td>
</tr>
<tr>
<td>Accommodation, cafes and restaurants</td>
<td>40</td>
<td>84</td>
<td>124</td>
<td>41</td>
<td>210</td>
<td>36</td>
<td>287</td>
<td>3</td>
<td>191</td>
<td>131</td>
</tr>
<tr>
<td>Transport and storage</td>
<td>33</td>
<td>173</td>
<td>205</td>
<td>34</td>
<td>452</td>
<td>54</td>
<td>540</td>
<td>4</td>
<td>193</td>
<td>163</td>
</tr>
<tr>
<td>Communication services</td>
<td>13</td>
<td>51</td>
<td>64</td>
<td>5</td>
<td>29</td>
<td>5</td>
<td>39</td>
<td>-61</td>
<td>-34</td>
<td>-39</td>
</tr>
<tr>
<td>Finance and insurance</td>
<td>0</td>
<td>22</td>
<td>22</td>
<td>4</td>
<td>22</td>
<td>8</td>
<td>34</td>
<td>na</td>
<td>34</td>
<td>52</td>
</tr>
<tr>
<td>Property and business services</td>
<td>49</td>
<td>211</td>
<td>260</td>
<td>53</td>
<td>383</td>
<td>56</td>
<td>492</td>
<td>8</td>
<td>108</td>
<td>89</td>
</tr>
<tr>
<td>Government administration and defence</td>
<td>18</td>
<td>15</td>
<td>34</td>
<td>51</td>
<td>40</td>
<td>4</td>
<td>95</td>
<td>177</td>
<td>186</td>
<td>181</td>
</tr>
<tr>
<td>Education</td>
<td>145</td>
<td>148</td>
<td>292</td>
<td>144</td>
<td>218</td>
<td>62</td>
<td>424</td>
<td>0</td>
<td>90</td>
<td>45</td>
</tr>
<tr>
<td>Health and community services</td>
<td>143</td>
<td>60</td>
<td>202</td>
<td>180</td>
<td>116</td>
<td>14</td>
<td>310</td>
<td>26</td>
<td>118</td>
<td>53</td>
</tr>
<tr>
<td>Cultural and recreational services</td>
<td>3</td>
<td>78</td>
<td>81</td>
<td>6</td>
<td>81</td>
<td>19</td>
<td>106</td>
<td>87</td>
<td>28</td>
<td>30</td>
</tr>
<tr>
<td>Personal and other services</td>
<td>65</td>
<td>107</td>
<td>172</td>
<td>22</td>
<td>169</td>
<td>23</td>
<td>214</td>
<td>-66</td>
<td>80</td>
<td>25</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>875</strong></td>
<td><strong>4306</strong></td>
<td><strong>5181</strong></td>
<td><strong>850</strong></td>
<td><strong>7550</strong></td>
<td><strong>857</strong></td>
<td><strong>9257</strong></td>
<td><strong>-3</strong></td>
<td><strong>95</strong></td>
<td><strong>79</strong></td>
</tr>
</tbody>
</table>

**Note:** Excludes not stated and inadequately described responses.
**Source:** Queensland Transport
The most significant employment sectors in Ormeau-Yatala (which includes the Yatala enterprise area) in 2006 were manufacturing with 3012 jobs (40 per cent of total jobs in Ormeau-Yatala), followed by construction (1136 jobs, 15 per cent) and wholesale trade (825 jobs, 11 per cent). The *Gold Coast 2010: Economic Development Strategy* describes the 3000 hectares that comprises the Yatala enterprise area as one of the most important industrial land resources, particularly for larger scale industry, in South East Queensland.

The Yatala enterprise area accommodates a wide range of business and industry activities including the large Carlton and United brewery west of the M1. The Yatala enterprise area also includes the hard rock quarries of the Darlington range, which are vital to the South East Queensland construction industry. The proximity of these hard rock resources and the sand resources in the study area has led to the development of a significant cluster of firms manufacturing concrete and related products.

In the Jacobs Well-Alberton destination zone, which includes most of the rural and coastal areas in the study area, the most significant employment sectors in 2006 were agriculture, forestry and fishing (169 jobs, 20 per cent of total employment in the destination zone), manufacturing (165 jobs, 19 per cent) and construction (103 jobs, 12 per cent).

The main manufacturing sector activities in this destination zone comprise the marine industry activities at a number of locations along the coast but particularly at the rapidly expanding Horizon Shores marina, the Rocky Point mill and cogeneration plant (which employs around 80 people), and the two sugarcane mulching operations at Woongoolba and Alberton.

Although the mining sector (which includes gravel and sand quarrying and construction material mining) is an important activity in the study area, it is not significant in terms of direct employment, providing only 87 jobs (or 1 per cent of total employment) in 2006. However, this data underestimates its significance as this sector also provides the raw materials for a number of concrete product manufacturers that have established in the Yatala enterprise area to take advantage of the proximity to input suppliers, as well as supplying a significant proportion of the region’s demands for construction aggregates and sand.

The following sections provide additional information on several economic sectors that are of particular relevance and importance to the study area.

### 5.3 Extractive industries

The SEQ region contains significant extractive resources, including sand, gravel and hard rock that provide considerable benefits to the regional economy and make a vital contribution to the construction industry and infrastructure development. The information presented in this section has been provided by the Department of Mines and Energy.

The extractive industries in the Jacobs Well and Stapylton key resource areas (KRA) are identified in the *State Planning Policy 2/07: Protection of Extractive Resources* as KRA 65 and KRA 69 and are shown on Map 3.3. The sand resources supply a market area comprising the southern part of Brisbane and Logan cities, the Redland Shire and most of the Gold Coast City.

The market area for hard rock is similar except that the Redland Shire is excluded due to the presence of two large hard rock quarries in that Shire which would act to limit market penetration of Gold Coast quarries into that area.

The penetration of the study area’s extractive resource operations into other parts of the region is likely to be limited by their inability to compete with other significant resources closer to or within those sub-regions due to higher transport costs. Transport costs represent a significant proportion of the price of extractive materials.
The existing transport routes from KRA 65 and KRA 69 are conveniently situated to reach the Pacific Motorway close to large markets for construction materials in the respective market areas.

Table 5.3A presents preliminary estimates prepared by Department of Mines and Energy of the resources present in each of the component areas of the KRAs in the study area. Refer to Map 3.3 to identify the specific areas referred to in the table. The preliminary estimates suggest that the study area contains approximately 165 million tonnes of sand resource and 25.5 million tonnes of rock resource.

**Table 5.3A—Extractive resource estimates (preliminary)**

<table>
<thead>
<tr>
<th>Resource Area</th>
<th>Resource Quantity (thousand tonnes)</th>
<th>Resource Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>KRA 63</td>
<td>15 000</td>
<td>Sand</td>
</tr>
<tr>
<td>KRA 65—Area A1</td>
<td>7 000</td>
<td>Sand</td>
</tr>
<tr>
<td>KRA 65—Area A2</td>
<td>75 000</td>
<td>Sand</td>
</tr>
<tr>
<td>KRA 65—Area B</td>
<td>28 000</td>
<td>Sand</td>
</tr>
<tr>
<td>KRA 65—Area C</td>
<td>33 000</td>
<td>Sand</td>
</tr>
<tr>
<td>KRA 65—Area D1</td>
<td>45 000</td>
<td>Sand</td>
</tr>
<tr>
<td>KRA 65—Area D2</td>
<td>13 000</td>
<td>Sand</td>
</tr>
<tr>
<td>KRA 65—Area E</td>
<td>45 000</td>
<td>Sand</td>
</tr>
<tr>
<td><strong>Total sand</strong></td>
<td><strong>180 000</strong></td>
<td></td>
</tr>
<tr>
<td>KRA 69—Area A</td>
<td>12 000</td>
<td>Rock</td>
</tr>
<tr>
<td>KRA 69—Area A</td>
<td>13 500</td>
<td>Rock</td>
</tr>
<tr>
<td><strong>Total rock</strong></td>
<td><strong>25 500</strong></td>
<td></td>
</tr>
</tbody>
</table>

Note 1: This is the estimate for the eastern portion of the resource under quarry ownership. The western portion may contain a similar amount of sand resource but it is difficult to access.

Source: Department of Mines and Energy, 2008 (unpublished)

Table 5.3B shows the annual production (by financial year) from each of the extractive industry operations in the study area. There has been no production from the Marks Road operation as there is no development approval in place, and the Wholesale Sands Pty Ltd operation at Jacobs Well is running out of resource although this is not apparent from the table.

**Table 5.3B—Annual production of extractive materials**

<table>
<thead>
<tr>
<th>Quarry Name</th>
<th>Company</th>
<th>Material</th>
<th>Annual Production (tonnes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stapylton (Boral)</td>
<td>Boral Resources (Qld) Pty Ltd</td>
<td>Hardrock</td>
<td>1 300 000</td>
</tr>
<tr>
<td>Stapylton (Astec)</td>
<td>Astec Pty Ltd (FRH Group)</td>
<td>Hardrock</td>
<td>550 000</td>
</tr>
<tr>
<td>Jacobs Well (Laming)</td>
<td>Wholesale Sands Pty Ltd (S.B Laming)</td>
<td>Sand</td>
<td>200 000</td>
</tr>
<tr>
<td>Jacobs Well (Q S&amp;S)</td>
<td>Pimpama Sands Pty Ltd</td>
<td>Sand</td>
<td>15 000</td>
</tr>
<tr>
<td>Carbrook</td>
<td>River Sands Pty Ltd (Neumann Group)</td>
<td>Sand</td>
<td>200 000</td>
</tr>
<tr>
<td>Marks Road</td>
<td>Neumann</td>
<td>Sand</td>
<td>0</td>
</tr>
</tbody>
</table>

Source: Department of Mines and Energy, 2008 (unpublished)

Table 5.3C presents estimates of the proportions of the production of hard rock in the market area supplied by the study area resources, derived from totalling the production of hard rock within the market areas.
Table 5.3C—Share of hard rock market area supply provided from the North East Gold Coast study area

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Stapylton</td>
<td>Boral Resources (Qld) Pty Ltd</td>
<td>9.97</td>
<td>14.12</td>
<td>13.18</td>
<td>12.13</td>
</tr>
<tr>
<td>Stapylton</td>
<td>Astec Pty Ltd (FRH Group)</td>
<td>4.16</td>
<td>4.62</td>
<td>3.73</td>
<td>5.51</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>14.13</td>
<td>19.74</td>
<td>16.91</td>
<td>17.64</td>
</tr>
</tbody>
</table>

Source: Department of Mines and Energy, 2008 (unpublished)

The presence of a number of hard rock quarries in the market area, including those in the Darlington Range west of the M1, limits the proportion of hard rock supplied from within the study area to 15–20 per cent of total supply. The two hard rock resources in the Stapylton KRA (KRA 69) have a limited amount of approved resource remaining. However, there are unapproved resources adjacent to the existing operations and they are conveniently located near the Pacific Motorway and the Yatala Industrial Area.

Table 5.3D presents estimates of the proportions of the production of sand in the market area supplied by the study area resources, derived from totalling the production of sand within the market area.

Table 5.3D—Share of sand market area supply provided from the North East Gold Coast study area

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Jacobs Well</td>
<td>Wholesale Sands Pty Ltd (S.B. Laming)</td>
<td>31.61</td>
<td>33.68</td>
<td>50.25</td>
<td>33.15</td>
</tr>
<tr>
<td>Jacobs Well</td>
<td>Pimpama Sands Pty Ltd</td>
<td>2.27</td>
<td>6.03</td>
<td>8.72</td>
<td>18.59</td>
</tr>
<tr>
<td>Carbrook</td>
<td>River Sands Pty Ltd (Neumann Group)</td>
<td>34.75</td>
<td>54.20</td>
<td>33.81</td>
<td>29.46</td>
</tr>
<tr>
<td>Marks Road</td>
<td>Neumann</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>68.63</td>
<td>93.91</td>
<td>92.78</td>
<td>81.20</td>
</tr>
</tbody>
</table>

Source: Department of Mines and Energy, 2008 (unpublished)

The extensive Jacobs Well KRA (KRA 65) is the largest remaining sand resource in South East Queensland suitable for supplying the Brisbane and Gold Coast markets with fine sand for concrete and asphalt. Fine sand is an important component of construction materials such as plaster and mortar sand and for blending with manufactured sand produced by crushing of hard rock.

The study area provides a high proportion of the total supply of sand to the market area that comprises southern Brisbane, Logan City, Redland Shire and Gold Coast City. It is an extremely important source of supply, particularly for fine sand, and it is important that it continues to supply a large proportion of the demand from the identified market area, and that the resource is protected for long-term future use.

Recent developments in concrete technology have allowed the use of sand manufactured from hard rock to be used in concrete production. An increased proportion of fine sand must be used to produce satisfactory concrete aggregate gradings, and the Jacobs Well fine sand resources are within a convenient distance of the established manufactured sand producers in the hard rock quarries of the Northern Darlington Ranges.

Table 5.3E presents a preliminary estimate of demand for fine sand to 2026 for the market area most likely to be supplied by the Jacobs Well resource (comprising Gold Coast City, Logan City, one-third of Brisbane City’s demand plus the balance of the former Beaudesert
Shire) prepared by Department of Mines and Energy based on an assumed annual demand of 0.76 tonnes per person.

More detailed demand estimates will be prepared as part of the SEQ Extractive Industry Strategy. However, the results of this work will not be available until the last quarter of 2008. Department of Mines and Energy’s preliminary estimate of the market area demand provides a reasonable basis for estimating demand for sand from the study area.

Table 5.3E—Estimate of demand for fine sand for the market area supplied by Jacobs Well to 2026

<table>
<thead>
<tr>
<th>Year</th>
<th>Projected Population</th>
<th>Per Capita Demand (tonnes)</th>
<th>Annual Demand (000 tonnes)</th>
<th>Cumulative Demand (000 tonnes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>992 662</td>
<td>0.76</td>
<td>754</td>
<td>754</td>
</tr>
<tr>
<td>2009</td>
<td>1 018 111</td>
<td>0.76</td>
<td>774</td>
<td>1 528</td>
</tr>
<tr>
<td>2010</td>
<td>1 044 216</td>
<td>0.76</td>
<td>794</td>
<td>2 322</td>
</tr>
<tr>
<td>2011</td>
<td>1 068 779</td>
<td>0.76</td>
<td>812</td>
<td>3 134</td>
</tr>
<tr>
<td>2012</td>
<td>1 086 974</td>
<td>0.76</td>
<td>826</td>
<td>9 960</td>
</tr>
<tr>
<td>2013</td>
<td>1 105 503</td>
<td>0.76</td>
<td>840</td>
<td>4 800</td>
</tr>
<tr>
<td>2014</td>
<td>1 124 373</td>
<td>0.76</td>
<td>855</td>
<td>5 655</td>
</tr>
<tr>
<td>2015</td>
<td>1 143 589</td>
<td>0.76</td>
<td>869</td>
<td>6 524</td>
</tr>
<tr>
<td>2016</td>
<td>1 162 199</td>
<td>0.76</td>
<td>883</td>
<td>7 407</td>
</tr>
<tr>
<td>2017</td>
<td>1 179 259</td>
<td>0.76</td>
<td>896</td>
<td>8 304</td>
</tr>
<tr>
<td>2018</td>
<td>1 196 602</td>
<td>0.76</td>
<td>909</td>
<td>9 213</td>
</tr>
<tr>
<td>2019</td>
<td>1 214 234</td>
<td>0.76</td>
<td>923</td>
<td>10 136</td>
</tr>
<tr>
<td>2020</td>
<td>1 232 161</td>
<td>0.76</td>
<td>936</td>
<td>11 072</td>
</tr>
<tr>
<td>2021</td>
<td>1 249 887</td>
<td>0.76</td>
<td>950</td>
<td>12 022</td>
</tr>
<tr>
<td>2022</td>
<td>1 266 078</td>
<td>0.76</td>
<td>962</td>
<td>12 984</td>
</tr>
<tr>
<td>2023</td>
<td>1 282 515</td>
<td>0.76</td>
<td>975</td>
<td>13 959</td>
</tr>
<tr>
<td>2024</td>
<td>1 299 201</td>
<td>0.76</td>
<td>987</td>
<td>14 946</td>
</tr>
<tr>
<td>2025</td>
<td>1 316 140</td>
<td>0.76</td>
<td>1 000</td>
<td>15 947</td>
</tr>
<tr>
<td>2026</td>
<td>1 333 395</td>
<td>0.76</td>
<td>1 013</td>
<td>16 960</td>
</tr>
</tbody>
</table>

Notes: 1. PIFU Medium series: Estimated Resident Population

Source: Department of Mines and Energy

The demand estimates shown in Table 5.3E indicate that the market area’s cumulative demand for fine sand will be around 7.5 million tonnes to 2016, 17 million tonnes to 2026, and (by extrapolation) around 22 million tonnes to 2031. Total estimated demand for the market area to 2031 comprises only about 12 per cent of the estimated fine sand resource within the study area.

It is difficult to estimate the proportion of total market area demand for fine sand that will be supplied from the study area. There are a number of potential alternative suppliers including Mundoolun Sands in the former Beaudesert Shire, suppliers in northern New South Wales and sand from Moreton Bay. However, as shown in Table 5.3D, a high proportion of the total market area supply (over 90 per cent in some years) has come from the study area over recent years.

The fine sand resources in the study area are very well located to supply the main centres of demand within the market area. This locational advantage is likely to become more important with further increases in fuel prices, which will upset the traditional calculation that the price of aggregate doubles every 50 kilometres, making Jacob’s Well and Carbrook-Eagleby even more significant suppliers in the future.

Therefore it seems prudent to assume for planning purposes that the total market area demand for fine sand will be supplied from the study area, as this will ensure that there are no artificial limitations to supply and provide a buffer against unforeseen increases in demand.

Much of the KRA overlays a large aquifer storage and recovery area as identified on Map 6.1. It is important that any future extractive industry does not compromise the integrity of this aquifer for future watercycle management.
In considering any sequence of development for extractive industries within the study area, due regard should be given to the quality of the agricultural land overlying the resource, accessibility to infrastructure and opportunities to provide flood offset and marina basins associated with marine industry precincts.

Throughout the city, disused extractive industry pits have been rehabilitated for a range of uses. Currently these uses include recreational lakes, landfill sites and parks. There are other examples, such as Penrith Lakes in Sydney, where disused extractive pits have been redeveloped into major sporting facilities. In the context of the study area, the rehabilitation of any extractive industry site may provide long-term opportunities for regional outdoor recreation, wetland and ecosystem services (including support for nutrient management for aquaculture) and potential flood offsets.

Currently an innovative approach to rehabilitation may be seen at Jacobs Well where acidic water within the extraction ponds is recycled with concrete washout waste from local batching plants (which is highly alkaline). The process creates saleable material (gravels, sand and mineral filler) and pH neutral water. Such innovation highlights the potential synergies between local extractive industries, material processing at Yatala and rehabilitation of extractive industry ponds for other potential uses.

### 5.4 Agriculture

Agricultural production in the study area is worth almost $25 million per year (ABS, 2001) spread across three main industries—sugarcane, plant nurseries and animal production. Table 5.4A provides data on the value of agricultural production from the 2001 Census.

#### Table 5.4A—Value of agricultural production in the North East Gold Coast Area

<table>
<thead>
<tr>
<th></th>
<th>Sugarcane</th>
<th>Nurseries</th>
<th>Other Crops</th>
<th>Poultry</th>
<th>Other animal production</th>
<th>Total Agriculture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value ($)</td>
<td>7 865 872</td>
<td>7 066 325</td>
<td>2 229 873</td>
<td>2 879 897</td>
<td>4 668 126</td>
<td>24 710 093</td>
</tr>
<tr>
<td>Percent (%)</td>
<td>31.8%</td>
<td>28.6%</td>
<td>9.0%</td>
<td>11.7%</td>
<td>18.9%</td>
<td>100.00%</td>
</tr>
</tbody>
</table>

Source: ABS, 2001

While sugarcane makes up 32 per cent of the value of production, animal production (including poultry and aquaculture) provide 30 per cent and nurseries (including turf and flower production) provide a further 29 per cent. Other crops grown including fruit and vegetables make up the remaining 9 per cent.

#### 5.4.1 Sugarcane

This section of the report is largely drawn from a report by CSIRO on the future use of the Rocky Point cane landscapes (CSIRO, 2007) and supplemented by more recent data.

Figure 5.4 illustrates that the area of cane production at Rocky Point has remained at around 5800 hectares over the past 16 years. However, the area harvested and tonnes of cane crushed have varied. The area harvested has declined by an average of 37 hectares a year since 1991 and the tonnage of cane crushed has declined by 6 tonnes per year. In 1996, approximately 6000 hectares of cane was under production and around 402 000 tonnes of cane were crushed in the mill. In 2006 the total area producing cane was 5534 hectares, resulting in 381 000 tonnes of cane crushed. In 2007, a year of low sugar prices, low rainfall and damaging frosts, only 238 000 tonnes were crushed.

The Rocky Point region has been producing sugarcane for more than 100 years. It was established in 1879 and is the only privately owned mill in Australia, owned by W H Heck and Sons Pty Ltd. Rocky Point is an important regional production area for sugar in Queensland due to its location near shipping and transport hubs to the Brisbane Ports. From 1992 to 2001
the Rocky Point area provided on average 1.3 per cent of Queensland’s sugar production area while providing on average 1.13 per cent of the total state’s sugarcane production (Department of Primary Industries, 2002). In 2006, average cane yield at Rocky Point was 91 tonnes per hectare compared with an Australian average of 95 tonnes per hectare.

The mill generates a gross income from sugar, molasses and ethanol of approximately $19.3 million. Growers are paid by the mill and receive approximately two-thirds of the gross proceeds from the sale of sugar or $9.7 million at 13.3 CCS\(^5\). In 2006 the mill employed 60 people. The co-generation plant, owned by Babcock and Brown and located on the mill site, employs a further 19 people. The growers contract a cane haulier to transport cane to the mill. The haulier employs 13 people who operate over the 22-week cane crushing season (June to December).

In the past the mill has supported a critical mass of cane as the basis for financial sustainability, estimated to be around 500 000 tonnes in the 1980s (Forster, 1989) and more recently 290 000 tonnes (RAG, 2005). As shown in Figure 5.4, the former tonnage has not been achieved while the latter tonnage has been achieved in 14 out of the past 17 years.

**Figure 5.4—Rocky Point sugarcane production (1991–2007)**

![Graph showing sugarcane production at Rocky Point from 1991 to 2007.](source)

Source: CSIRO, 2007; Rocky Point District Canegrowers Association, 2007

However, due to the diversification strategies of the Rocky Point mill into ethanol and its contracting relationships with the co-generation plant, this critical production mass is no longer considered a reliable production threshold as it does not reflect the complexity of the Rocky Point mill operation.

Currently the Rocky Point mill does not identify a minimum critical mass for mill throughput but ensures its financial sustainability on a matrix of contracts with sugar production, ethanol production and feedstock production for co-generation. It should also be noted that the Rocky Point mill is a vertically integrated operation, as the mill owners are also the largest land holder producing 15 per cent of the cane for the mill as well as being the owner and operator of the mill.

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\(^5\) CCS (Commercial Cane Sugar): An estimate of pure sugar recoverable from cane, expressed as a percentage.
Farm viability is a critical factor in future cane supply to the mill. An ABARE study (Hooper et al, 2007) has indicated that Queensland sugar producers producing less than 7500 tonnes suffered an average farm business loss of over $17 000 in 2005–06. Similar losses were suffered by two-thirds of all sugarcane producers in Queensland. The ABARE study found that Queensland farms above this level were on average profitable (Table 6 Hooper et al, 2007). It could be expected that industry restructuring through purchase of smaller farms by larger growers would occur as is happening elsewhere in the industry—however this is difficult in Rocky Point due to the high cost of land (see 5.4.4).

The CSIRO report indicates that a 100 hectare farm would return a farm business profit of $6500 at a sugar price of $300 per tonne ($25.80 per tonne of cane), whereas at a sugar price of $350 per tonne, profit increases to $35 270. The CSIRO report estimated that a 66 hectare farm producing sugarcane, mulch and soybeans would make a loss of $21 000 at $300/tonne. Estimates for profitability at the predicted higher sugar prices were not undertaken.

The outlook for the world sugar price is optimistic due to an increasing demand for ethanol production and a reduction in the production of beet sugar in Europe (ABARE Outlook report, 2008). In recent years, the sugar price increased from $322 per tonne in 2005–06 to $370 per tonne on 2006–07 but declined to a low of $270 per tonne in 2007–08. Analysts are predicting prices increasing to $340 per tonne in 2009. The future oil price will also have a bearing on industry income through potential sales of ethanol from the expanded Rocky Point ethanol distillery.

The Rocky Point farming community is dominated by small producers. Of the 66 growing entities in 2006, 12 producers harvested more than 100 hectares of cane and a further 17 producers harvested more than 66 hectares of cane. In 2006, 14 growers produced in excess of 7500 tonnes of cane or 63 per cent of the mill's cane supply. This contrasts with the 40 growers that produced less than 4000 tonnes of cane per farm or only 20 per cent of the cane processed by the mill. Canegrowers believe that the local industry is struggling financially and that most growers and the mill will not survive the next five years. It is estimated that due to the low prices in 2007 the average small grower is losing $88 000 per year (Danzi, 2008).

There is anecdotal evidence that many smaller growers intend to cease cane growing in the near future due to low sugar prices, increasing costs of production and loss of interest in cane growing due to age and other factors. The extent to which such land remains available for cane growing through the sale of land or the expansion of leasing arrangements will determine the future area of cane production in the area.

Growers have undertaken diversification strategies to maintain their individual long-term viability. One strategy has been the increased prevalence of green cane, which produces crop residues that can be used for mulch production. Mulch production is now considered an integral part of a sugarcane farming enterprise.

Despite recent efforts to diversify by creating niche markets for sugar products, the highly fragmented landscape and the lack of opportunity to expand horizontally continues to threaten the long-term viability of the sugar industry at Rocky Point (Hildebrand 2002). Despite larger growers leasing land from other landholders to increase individual areas under cane, there has been an overall decline in the area harvested for the production of sugarcane at Rocky Point over the past 15 years. With these limitations there is a real prospect that the amount of sugarcane grown may fall below a level sufficient to maintain the viability of the mill. This could lead to closure of the Rocky Point mill. The sugar mill is more optimistic, believing that with diversification by both the mill and growers, the local industry has at least a medium term future (Heck Group, 2008.)

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6 Cash operating surplus less depreciation, operator's labour costs.
5.4.2 Rocky Point Mill diversification

The Rocky Point mill has pursued a diversification policy by developing niche markets for sugar products and complementary processes in order to sustain the viability of the mill over the longer term (Hildebrand 2002). These include production of alcohol (ethanol), burning of green wastes and cogeneration of electricity. The Rocky Point mill has received a number of federal and state government agribusiness grants including a $2.4 million Commonwealth Government biofuels grant to increase its current fuel ethanol production capacity. The Rocky Point mill is also a major beneficiary of the Gold Coast City Council’s Northern Wastewater Strategy and Reclaimed Water Scheme, which uses the water on its cane farming properties and provides water to the co-generation plant (Hildebrand 2002).

Ethanol provides an opportunity for the sugar mill to market a greater range of products and take advantage of rising global fuel prices, particularly when sugar market prices are below the cost of production. The Rocky Point mill is expected to have an increased ethanol production capacity of 15 megalitres per year in late 2008. The expanded distillery will be able to use either grain or sugar feedstock, providing flexibility in response to world and domestic commodity prices. However, as the ethanol distillery is a value-adding processing step occurring after the sugar has been crushed, it will not so much add a greater demand for the harvest but spread the risk of low sugar prices if the mill can produce sugar and ethanol from the same tonnage.

The electricity cogeneration plant at the mill is owned and operated by Babcock and Brown and is a Green Power accredited generator. The plant generates 30 megawatts of green energy using 30 to 35 tonnes per hour of green and woody waste (depending on the moisture content). When using the processed cane (40 tonnes per hour of bagasse) and some waste (10 tonnes per hour) it generates 20 megawatts of green energy and 70 tonnes of steam per hour which is used to power the Rocky Point mill and distillery.

The Rocky Point Green Power plant has a broad aim to be a sustainable practice organisation and it achieves this through two approaches. Firstly, all inputs to Rocky Point Green Power are relatively low quality secondary resources (e.g. wastes) whilst almost 100 per cent of the outputs are value-added by-products from lower grade secondary resource inputs (outputs include electricity to the grid, steam to Rocky Point mill and distillery and purified water). Purified water is available as a value-added by-product on-site.

Secondly, it has endeavoured to have strong local community links through collocation of the plant with compatible facilities (i.e. inputs from the mill and outputs used at the mill and distillery). This can be further enhanced with the potential of downstream facilities to co-locate with existing facilities (e.g. light manufacturing) or for all the outputs of the plant to be used locally (e.g. water could be used by the aquaculture industry or other crops that require higher grade water than is currently available).

The plant was built to operate for 20 years (from 2001 to 2020). Current feedstock investigations have shown that this is still an accurate time horizon. Importantly, at present 86 per cent of feedstock is from the mill as bagasse. When this product is not available the energy plant sources extra green and woody wastes from the surrounding local councils.

5.4.3 Sugar industry strategic planning

The sugar industry reform program in 2004 created regional advisory groups (RAG) to develop and implement regionally based plans for improved environmental, social and economic outcomes for the sugar industry. The South RAG commenced in August 2004 and prepared a strategic plan for the Rocky Point mill area with the objective of maintaining sugarcane production and maximising farm returns in the short-term (RAG, 2005:21). The plan includes assessment of the region’s capacity to produce and export raw sugar against worse case scenario forecasts, examination of the alternatives for the sugar industry, including alternative crops and alternative economic activities and a program for ensuring the adoption of a whole-of-industry systems approach for pursuing efficiency, productivity and profitability gains. The report also indicated that the future of the sugar industry at Rocky Point
is dependent on the implementation of a strategy that seeks to align the objectives of the miller and growers. An operational element of this has been the implementation of future contracts (of at least an annual period) between the miller and growers to share risk and reduce uncertainty around cane production, prices and costs.

While the strategic plan has focused primarily on ensuring the production of sugarcane in the short term, it also acknowledged the need for a cooperative approach to developing a future plan that identifies a series of options to transition out of sugarcane production to ensure the social, economic and environmental impacts are minimised. Funding support to growers was contingent on them establishing a sound and sustainable business case for transition, which was undertaken and updated in July 2007 (see below). A broad range of financial counselling services for individual canegrowers, cane harvesters and their families was provided in preparation for a transition, under the sugar industry reform program.

In addition to the RAG strategic plan, the Rocky Point Sugar Industry Strategic Plan 2007–2012 was developed by the mill and growers in response to low sugar prices. This plan identifies a series of short-term to medium-term goals and strategies which are considered essential to achieving a ‘profitable and sustainable Rocky Point sugarcane based industry that shares the benefits of increased diversification’ (Chapman, 2006). A major element of the plan is to improve farm profitability by identifying opportunities to enhance off-farm income and reduce capital expenditure. There is also a strong focus on the need to increase information sharing between the miller and growers to maximise potential profit and share risks.

### 5.4.4 Options for continued sugarcane growing

The peak period for sugarcane production was between 1996 and 2001 when over 6000 hectares of land was under production. In 1989, suitability maps produced by the then Department of Primary Industries (Forster 1989) show that 8709 hectares were biophysically suitable for sugarcane production with minor or moderate limitations and a further 1867 hectares were marginal for sugarcane. More recent investigations (Ellis and Wilson 2007) that take account of new data on salinity and acid sulphate soils constraints have assessed that 3148 hectares are suitable for sugarcane production and 3963 hectares are marginal.

**Leasing land**

An estimated 1500 hectares of land (about 27 per cent of total area producing cane) is currently being leased by growers to produce cane. This land may be owned by ex-canegrowers or by development interests. These leases vary in length from one to nine years (pers comms Canegrowers Rocky Point). As there is a high speculative component in land values in the area (approx. $75 000 per hectare), it is unlikely that growers wishing to expand their area of cane production could afford to buy land and expect a return on investment. If planning controls continue to restrict land use to non-urban and rural uses, leasing land is likely to be the means by which the cane growing area will be maintained or expanded in the future.

**Transport cane to NSW for processing**

Transport is a significant issue for cane growing in Australia as haulage costs can be prohibitive. Rocky Point is a landlocked production area with the next closest mill located at Condong 60 kilometres away in NSW. A significant advantage for the Rocky Point farmers is having the Rocky Point Mill located close to production areas and a relatively small distance to haul cane. In 2006, haulage cost to mill was $3.50 per tonne. This is offset by the mill haulage rebate of $1.15 per tonne, resulting in a net haulage cost to each farmer of $2.35 per tonne of cane. Cartage allowance (rebate) and costs of haulage is dependent on external factors, such as the price of sugar and cost of diesel, therefore haulage costs to farmers and miller change year to year.

If the Rocky Point mill were to close, continuing canegrowers would need to transport their cane to another mill such as Condong in northern NSW. The cost of haulage to the farmer is
one of the significant barriers to this option. However, this option may be feasible with the completion of the Tugun Highway by-pass and favourable sugar prices.

**Irrigation by recycled water**
Production data from southern Queensland shows that in 2006 average cane yield under irrigation was over 30 tonnes per hectare greater than without irrigation (ABARE, 2007). Recycled water irrigation is currently used by four sugarcane farms supplied from the Beenleigh wastewater treatment plant using on average 0.5 megalitres per day. As described in section 6.3, Gold Coast Water has plans to expand the volume and reliability of supply of wastewater available for irrigation and other uses.

**5.4.5 Non sugarcane productive uses**
This section of the report is drawn from the CSIRO report on alternative crops to sugarcane for the Rocky Point Area (CSIRO, 2007) and supplemented by recent land suitability information from the Department of Natural Resources and Water.

**Crops**
Suitability for agricultural production is largely dictated by the varying soil types found across the region (Section 3.3.1). The Rocky Point area is prone to flooding as a result of the predominantly summer rainfall pattern and generally poor soil permeability in many areas. The majority of the area lies within the extent of a 100 ARI flooding event. In contrast, the dry winter months are characterised by prolonged periods of low plant available soil moisture. The general lack of irrigation infrastructure throughout the district means that crop stress is inevitable during these periods. The Rocky Point area therefore can be thought of as experiencing periods of over and undersupply with regard to crop water availability.

It should be noted that the crops and enterprises selected for assessment of suitability by CSIRO were those identified by the greatest proportion of canegrowers responding to a questionnaire as being likely to be undertaken as a means of achieving a viable financial income. Twenty-four crops or enterprises were assessed for the Rocky Point area including six broad-acre crops, six tree or vine crops, seven horticulture crops and five other crops (including amenity horticulture and native foods).

This method of selecting the crop species for assessment by CSIRO inevitably excluded a number of potentially suitable options for the area such as sweet corn, cucurbits, capsicum and a range of forestry uses. These and other uses have been assessed for suitability by the Department of Natural Resources and Water.

The focus of the assessment by CSIRO was predominantly on the agronomic suitability of the selected crop species, although some social and economic information based on interviews with local growers and crop experts was used in the assessment. In the assessments, consideration was given to the estimated frequency of obtaining adequate yield quality and quantity in a sufficient number of years to enable the enterprise to be financially viable over the long term. Gross margin budgets have been produced for a limited number of crop species for the Sunshine Coast area (CSIRO, 2006) and, given the similar biophysical conditions found in Rocky Point, these were applied to production in Rocky Point.

Suitability was assessed using a combination of crop models, published literature, anecdotal information from growers trialling alternative crop species in the region and expert opinion. Information gained from local growers indicated that a large number of crop species have previously been trialled in the region using informal non-replicated experimental procedures. Accounts of individual successes with particular crop species highlights the importance of micro-climates and grower knowledge and skill on levels of crop success.

While it is noted that most cultivated crops at Rocky Point generally require supplementary irrigation for economically viable production, there is presently little irrigation infrastructure in the region. However this may change with the expansion of the wastewater recycling program (see section 6.3).
Tree crops
Avocado, lychee and macadamia are all considered to be agronomically unsuitable for widespread production on the Rocky Point canelands, primarily due to poorly drained soils, flooding and periodic high water table. It is possible that mango may be produced in small pockets around the area totalling 1072 hectares if irrigation water can be supplied and pests and diseases managed effectively. Blueberry is similarly unlikely to be suitable for areas subject to periods of excessive soil moisture and need for irrigation during dry winter months. However small pockets of suitable land may be found in higher areas for small-scale production and these may benefit from the present unmet demand from the domestic market.

Native foods
A number of Australian native foods offer potential for small-scale production. In particular, Lilly pilly (riberry) is found growing wild in the region and provides tasty fruit. To a lesser extent, native tamarind, lemon aspen and a range of myrtles all exhibit tolerance to the conditions found in the Rocky Point region. Davidson’s plum, native raspberry and plum pine are considered relatively less suitable species, but may still tolerate small niche areas in the landscape. However, agronomic information on these species is generally limited and prospects for current and future markets are uncertain but thought to be growing. Present estimates of internal rates of return for riberry suggest 50 per cent to be a very conservative estimate of enterprise-level return. This, of course, has potential to decrease as the number of suppliers in the riberry market increases.

Fruit and vegetables
Horticultural crops considered included cucumber, potato, pumpkin, watermelon, ginger, strawberry and pineapple. In general, these crops require effective management of soil moisture. The widespread occurrence of waterlogged soils in summer and insufficient moisture in winter is likely to constrain the widespread production of these crops. The current lack of irrigation infrastructure throughout the district is a key constraint but alone is unlikely to fully address issues regarding effective soil moisture management. The Department of Natural Resources and Water has assessed that almost 3000 hectares are suitable for irrigated winter cropping of capsicum, cucurbits and tomato. In addition, horticultural crops rely on the production of quality produce and temporal advantages with market supply. Given that many of the markets for these crops are finely balanced, new producers will face high competition from areas such as the Lockyer Valley, Bundaberg and Bowen.

Turf and bamboo
Turf and bamboo are considered agronomically suitable to areas within the Rocky Point area. However, particular aspects of these enterprises must be borne in mind when considering them as a potential alternative to sugarcane production. Areas of turf production presently found in the district show that essential irrigation and exacting crop husbandry and concerns about environmental impact can be successfully addressed; and the Department of Natural Resources and Water land suitability information indicates that over 5000 hectares is suitable for turf irrigation. Bamboo also appears biophysically suited to much of the region and estimated to achieve a positive gross margin after three years and reach its maximum of approximately $25 000 per hectare in year 10 of production. However, domestic markets are presently small for both edible shoots and poles and future demand will rely upon sourcing overseas markets and the development of new composite products containing bamboo.

Broadacre crops and pastures
Nearly all of the broadacre crops (sorghum, soybean and sweet potato) have potential to be grown successfully, or have previously been or are presently being grown in the area. Only small areas are suitable for hemp or maize. Sown pastures must be seen as part of a larger livestock enterprise and the generally small size of cane farms in the Rocky Point region is not considered sufficient to support an economically viable grazing enterprise. The CSIRO report found that subject to irrigation, bamboo and turf may be grown over large areas of the region. A small number of other crop options/enterprises such as blueberry and native foods would be possible for landowners on the lighter textured, sandy soils generally found on the eastern half of the region, providing supplementary water supplies can be
accessed. A number of Australian native foods may also be suitable for small niche areas in the landscape and local conditions will dictate the suitability of each site. Pockets of higher, well-drained soils may offer a number of options for small scale crop production. However, in the majority of cases, the areas of production are likely to be small and production will be dependent upon accessing supplementary water during dry winter months.

Large areas (more than 3000 ha) in the area are suitable for soybeans but generally unsuitable to most other crop species, with the exception of small areas of sorghum and patches of small crops providing irrigation water is supplied. Overall the CSIRO report noted that without the widespread installation of irrigation infrastructure there are no crop species, other than sugarcane, that may be suitable for widespread production across the broad range of land types found in the Rocky Point.

However the Department of Natural Resources and Water land suitability assessments indicates that without irrigation, large areas of land are suitable for soybean, sorghum and banana production. Suitable areas for selected crops are shown on Map 5.4.

These assessments consider the requirements for successful crop or forestry production but do not include economic considerations. Prices, markets and costs of production for the range of uses vary widely and must be considered carefully as part of any business planning for these enterprises. Areas of crop suitability are provided in Table 5.4B. The areas listed exclude land currently in the Urban Footprint or used for extractive industry or aquaculture.

<table>
<thead>
<tr>
<th>Crop/ land use</th>
<th>Area Suitable (Class A)</th>
<th>Area Marginal (Class B)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Without irrigation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sugarcane</td>
<td>3148</td>
<td>3963</td>
</tr>
<tr>
<td>Soybeans</td>
<td>3227</td>
<td>2566</td>
</tr>
<tr>
<td>Sorghum</td>
<td>1648</td>
<td>1266</td>
</tr>
<tr>
<td>Banana</td>
<td>1575</td>
<td>2051</td>
</tr>
<tr>
<td>Caribbean pine</td>
<td>1215</td>
<td>3058</td>
</tr>
<tr>
<td>Pineapple</td>
<td>208</td>
<td>2838</td>
</tr>
<tr>
<td>Maize (summer)</td>
<td>145</td>
<td>2060</td>
</tr>
<tr>
<td>Hemp</td>
<td>103</td>
<td>531</td>
</tr>
<tr>
<td><strong>With irrigation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sugarcane SI</td>
<td>5564</td>
<td>1868</td>
</tr>
<tr>
<td>Turf SI</td>
<td>5332</td>
<td>1569</td>
</tr>
<tr>
<td>Capsicum (winter) SI</td>
<td>2740</td>
<td>3149</td>
</tr>
<tr>
<td>Capsicum (summer) SI</td>
<td>307</td>
<td>5463</td>
</tr>
<tr>
<td>Cucurbit (winter) SI</td>
<td>2873</td>
<td>1086</td>
</tr>
<tr>
<td>Cucurbit (summer) SI</td>
<td>307</td>
<td>5463</td>
</tr>
<tr>
<td>Sweet potato (winter) SI</td>
<td>5566</td>
<td>1868</td>
</tr>
<tr>
<td>Sweet potato (summer) SI</td>
<td>307</td>
<td>5519</td>
</tr>
<tr>
<td>Tomato (winter) SI</td>
<td>2740</td>
<td>1218</td>
</tr>
<tr>
<td>Tomato (summer) SI</td>
<td>307</td>
<td>5463</td>
</tr>
<tr>
<td>Sweet Corn (winter) SI</td>
<td>145</td>
<td>2060</td>
</tr>
<tr>
<td>Sweet Corn (summer) SI</td>
<td>145</td>
<td>2060</td>
</tr>
<tr>
<td>Ginger (winter) SI</td>
<td>307</td>
<td>5519</td>
</tr>
<tr>
<td>Ginger (summer) SI</td>
<td>367</td>
<td>4051</td>
</tr>
<tr>
<td>Mango TI</td>
<td>1072</td>
<td>471</td>
</tr>
<tr>
<td>Citrus TI</td>
<td>262</td>
<td>2850</td>
</tr>
<tr>
<td>Lychee TI</td>
<td>201</td>
<td>1171</td>
</tr>
</tbody>
</table>

Notes: TI Trickle irrigation; SI Spray irrigation
Source: Department of Natural Resources and Water (2007)

The land suitability assessments undertaken by the Department of Natural Resources and Water take account of flooding frequency based on 1:100 flood mapping and local knowledge gained from consultation with growers.
When considered together, the area assessed as suitable for production with or without irrigation exceeds 3000 hectares. The availability of irrigation would allow a broader range of uses and increases the suitable area to over 5000 hectares.

**Forestry**

A variety of products can be produced from timber plantations, including a number of timber products as well as non-timber products such as foliage, flowers and essential oils. For humic gley soils which constitute a majority of the Rocky Point area, CSIRO found that the F1 Pinus hybrid species could be established for financially viable timber production. The Department of Natural Resources and Water has assessed that 1215 hectares is suitable for this species. In terms of tree species that could be used to develop revegetation plantings, only She oaks, Swamp oaks (*Casuarina spp*) and *Melaleuca spp* are also suitable for these soils. Other soil types, particularly the alluvial soils, can potentially be used to grow a wider range of species for conservation purposes.  

In addition, mixed species plantings with native timbers can provide significant ecosystem services once they are well established and the local fauna brings in seeds from surrounding areas to add to the diversity of plants and the ‘naturalness’ of the stand (Erskine and Caterall 2004, Kanowski et al. 2004). This may provide opportunities for landholders to establish recreation activities like walking or cycling tracks as well as tourist accommodation in conjunction with timber production.

Another species found to be financial viable across a range of soils was the F1 hybrid pine (*Pinus car. v. hon* x *P.ell.+*). The silvicultural regime for this species is well understood by industrial foresters. However the absence of timber processors is a constraint. Processors are unlikely to be interested in contracts for areas of less than 30 hectares, hence a consortium of growers would be necessary.

Contract options range from leasing land to plantation companies with no involvement in the plantation management, harvesting or marketing, to joint-venture agreements that may include lease payments and/or shares in harvest revenues determined according to the level of inputs provided by the partners. As with other primary industries, landholders who wish to establish plantations for commercial reasons need to pay close attention to the markets for their plantation products.

**5.4.6 Summary**

The CSIRO report concluded that only the few large farms in the region are likely to turn a profit with conventional enterprise options. The region’s typically smaller farms are run on a part-time basis, supplemented by (and effectively subsidised from) off-farm income. The wide availability of paid employment in the region (see section 5.2) makes it well suited for part-time farming where a substantial part of the farm-household’s income is from off-farm sources.

If the household wanted the farm to be the primary source of income, a mix of low-risk/low-income and high-risk/high-income enterprises may be considered. The Department of Natural Resources and Water suitability assessments indicate that without irrigation, large areas of land are suitable for soybean, sorghum and banana production. With irrigation the range of suitable crops increases to include turf, bananas and winter-grown cucurbits, sweet potatoes and tomatoes across large parts of the area currently used for growing cane. While mixed farming can be profitable, the potential for a profitable farming enterprise in the Rocky Point region is likely to be limited to the larger sugarcane farms.

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8 It is important to note that there remains uncertainty about which tree species can be successfully grown on the coastal floodplains. Informants from the Noosa District Landcare Farm Forestry Program had successfully established Swamp mahogany (*E. robusta*), Large fruited red mahogany (*E. pellita*) and Tallowwood (*E. microcorys*) on sites with humic gley ‘upstream’ and alluvial soils.

9 The CSIRO report indicates (p58) that the average farmer hours for a 66 hectare farm equates to about 650 hours/year. This works out to around 14 hours per week (48 weeks) on average.
The farm-household survey conducted by CSIRO also indicated that there was limited financial and psychological capacity in the region to radically change farming enterprise mixes. For the majority, the preferred option would be a centrally organised and marketed crop that would only require agronomic attention from farmers. Under the range of potential cropping options, this is most likely to be satisfied by the continuation of producing sugarcane. Any future large scale changes in crop enterprise will be driven by a combination of the larger growers on existing farms and new producers either leasing land for production or establishing high value enterprises on smaller areas.

5.5 Aquaculture

In November 2000 the Queensland Government identified aquaculture as a priority for the state and endorsed a range of initiatives to facilitate the ecologically sustainable development of the industry. The former Department of State Development and Innovation subsequently prepared a Coastal Aquaculture Land Suitability Assessment report, the objectives of which were to:

- identify areas suitable for aquaculture under the present regulatory framework to assist the government in planning for the growth of sustainable aquaculture in Queensland
- provide an investor with either identified sites with minor limitations or constraint maps that identified areas suitable for aquaculture to assist them to focus site investigations
- provide a resource to assist strategic land use planning for aquaculture, natural resource management and economic development.

A Geographical Information System (GIS) was used to map on a statewide basis the broad-scale planning and environmental characteristics to determine areas suitable for aquaculture. Areas unsuitable for aquaculture were eliminated and remaining areas identified as having either minor, moderate or major limitations for coastal aquaculture.10 Within the North East Gold Coast study area, Map 5.5 clearly indicates areas in the vicinity of the Logan River between Alberton and Woongoolba as having the greatest potential for aquaculture development with minor or moderate limitations (i.e. detailed site investigations still required).

Currently, there are eight aquaculture enterprises (prawn farms and hatcheries) in the study area, the majority to the west of Jacobs Well near the Logan River between Alberton and Woongoolba. These farms have a combined pond area of approximately 130 hectares, producing between 550–750 tonnes of prawns per year with an average gross value of $11 million per annum (Department of Primary Industries and Fisheries, 2007).

Current cost of production is between $10 and $13 per kilogram. This cost of production does not provide sufficient return to repay capital but given a gross margin of approximately $4–$5 per kilo, the industry is sustainable. The industry believes that continued long-term sustainable production is achievable. However, the capacity for the prawn farming industry to expand within the region is dependent on a number of social, environmental and economic considerations (Tyre et al. 2004).

At present, the biggest barrier for new entrants is the strict nutrient loads set by the Environmental Protection Authority (EPA). The EPA want a zero nutrient load for water used for new prawn producers, compared to background nutrient level. There is also considerable pressure from urban encroachment. In particular, nearby residential development continues to place pressure on prawn farming operations because of noise and smell.

Some expansion of the existing industry over the next five years is conceivable with annual production increasing to approximately 1000 tonnes. Expansion is likely to be via the existing six producers.

10 Full details of the methodology utilised in the land suitability assessment are contained in the Coastal Aquaculture Land Suitability Assessment report.
Long-term opportunities may exist to support industry expansion where future extractive industry ponds may be rehabilitated into wetland systems to provide a treatment function for aquaculture effluent.

5.6 Marine industry

The Queensland Government has identified the marine industry as one of its key industry growth sectors. The boating industry in Queensland now has a $2.6 billion annual turnover. Growing industry employment rose to 12 053 jobs in 2005–06 with more than 13 000 boats built in Queensland that year. Queensland exports reached $400 million in 2005–06, representing around 43 per cent of Australia’s exports for the boating industry of which $194 million was comprised of manufactured boats. The majority were built on the Gold Coast. The marine industry is also identified as a key industry sector in the Gold Coast 2010: Economic Development Strategy.

The marine industry, and the boatbuilding sector in particular, represents one of the largest sophisticated manufacturing and/or high value-added sectors in the state.

The Gold Coast Marine Industry Precinct, situated on the Coomera River to the south of the study area, has been a success having developed into a significant industrial cluster within 10 years. During this time approximately 65 hectares of land has been developed for a range of boat manufacturing, maintenance and marine support services. Much of the remaining marine zoned land is constrained to development from flooding hazards or infrastructure commitments (i.e. the inter regional transport corridor). It is currently estimated that there is in the order of 60 hectares available for future development within the marine precinct.

Of the 60 hectares, over half is controlled by three landowners. The availability of this land to cater for general marine industry expansion is at the discretion of these landowners. The remaining developable land is distributed among a variety of comparatively small, dispersed land holdings. The undeveloped marine zoned land at Coomera is expected to meet industry growth needs in the short term (<10 years). Given the lead time required to amend planning instruments, establish supporting infrastructure, assess development applications and develop facilities, there is a need to identify additional land to meet the long-term needs of the marine industry.

Preliminary investigations have identified potential for expansion of the existing marine industry precincts within the study area at Steiglitz and at Calypso Bay south of Jacob’s Well. These areas are adjacent to the main navigation channel between Brisbane and the Gold Coast but are also in an environmentally sensitive location adjacent to the Moreton Bay Marine Park. There may also be potential for the establishment of a working marina for grey boats (i.e. dredges, barges, work boats etc.) near the mouth of the Logan River within the study area following extraction of an existing sand resource.

The SEQ Regional Plan identifies the Steiglitz area as an economic activity centre for investigation. This area has potential to develop as a marine industry precinct, similar to the Gold Coast Marine Precinct.

Southern Moreton Bay is experiencing increasing demand from recreational and commercial vessels to access these waterways. This trend is giving rise to a number of significant issues including accessibility to cater for the increasing number of larger vessels (i.e. superyachts); safety regarding speed, natural shallowness and siltation of waterways; volume of traffic; water quality; dry land and water-based development; and environmental protection and capacity of the area.

As noted in Table 5.6 below, 59 770 recreational vessels were registered in the Brisbane South–Gold Coast region as at 30 April 2008, representing 27 per cent of the statewide total of 221 085. Overall growth in registered recreational vessels in Queensland since 2000 is 5.1 per cent per annum, compared with 7.8 per cent on the Gold Coast. Registrations of recreational vessels over 8 metres in length as at 30 April 2008 in the Brisbane South–Gold
Coast region represent 43.4 per cent of the Queensland total. The vast majority (92 per cent) of recreational vessel registrations are for vessels under 8 metres.

Table 5.6—Recreational boating registrations to April 2008

<table>
<thead>
<tr>
<th>Local Government Authority</th>
<th>Vessels Over 8m</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brisbane City South</td>
<td>1 277</td>
<td>13 705</td>
</tr>
<tr>
<td>Redland Shire Council</td>
<td>927</td>
<td>10 289</td>
</tr>
<tr>
<td>Gold Coast City Council</td>
<td>2 672</td>
<td>25 784</td>
</tr>
<tr>
<td>Logan City Council</td>
<td>368</td>
<td>9 992</td>
</tr>
<tr>
<td>Sub-total</td>
<td>5 244</td>
<td>59 770</td>
</tr>
<tr>
<td>Queensland total</td>
<td>12 075</td>
<td>221 085</td>
</tr>
</tbody>
</table>

Note: A significant proportion of the above figures include trailer vessels.

Commercial boating registrations as at 30 June 2007 represent 17 per cent (959) of the state total. Significant increases in recreational boating activity in the Gold Coast waterways (including superyachts) has heightened the demand for infrastructure such as land for marine-related industry to support and service this growing demand.

This rapid increase in demand has prompted the Queensland Government to prepare and implement a master plan to guide marine infrastructure development in the Southern Moreton Bay area over the next 20 year period, taking account of both predicted demand and the environmental and physical capacity of this economically, socially and ecologically significant area.

The Department of Infrastructure and Planning is preparing the Southport Broadwater to Southern Moreton Bay Marine Infrastructure Master Plan (master plan), which is expected to be completed in August 2008. For the purposes of the study, marine infrastructure is defined to include slipways and other vessel haul-out facilities, marine related manufacture, service, maintenance and refit of vessels, and marinas and hardstand and dry boat storage facilities, among other things.

The North East Gold Coast study area is included within the study area for the master plan. The master plan is expected to identify areas that are suitable for future marine related infrastructure needs and to identify triggers for the timely provision of infrastructure, including a network of major navigation channels that will ensure safe passage for a range of vessels between the Broadwater and Southern Moreton Bay.

The master plan will also consider the potential impacts of marine industry development on recreational and commercial fishing activities and the capacity of the area’s waterways. It is expected that the master plan will provide an important resource for the consideration of marine industry opportunities within the North East Gold Coast study area.

The master plan will determine how much land is needed to facilitate expansion of this industry in the Steiglitz area or in other areas of the North East Gold Cost study area, together with any supporting infrastructure and services requirements. It will also assess the practicality of marine access and potential impacts on the local natural environment and natural resource values.

Gold Coast City Council’s Economic Development and Major Projects Directorate has prepared a preliminary estimate of land requirements to 2031 to accommodate the expected growth of the marine industry. Based on a continuation of the historic marine industry land take-up rate of eight hectares per year, it is estimated that 176 hectares would be required over the 22 years from 2009 to 2031.

There is approximately 104 hectares of appropriately zoned and suitable land available at Coomera (60 hectares) and Steiglitz (44 hectares), leaving a shortfall of approximately 72 hectares to 2031. Based on the experience at the Gold Coast Marine Industry Precinct at Coomera, only around 50 per cent of the gross site area may be suitable for marine industry development, meaning that approximately 144 hectares of gross land area may be required to
accommodate marine industry development to 2031. This preliminary estimate provides a reasonable estimate of demand for the purposes of this study, until a firmer estimate becomes available through the master plan.

5.7 Equine industry

One specific industry that could play an important role to service or support tourism and recreation industries within SEQ is the equine industry. Horse breeding and recreational horse riding is emerging as a new rural industry in the Gold Coast and Beaudesert areas. In 2005, the Beaudesert—Gold Coast Equine Industry Development Strategy was developed to address the strategic priority of being recognised as Queensland’s leading location for horse and horse related industries.

It is estimated that nationally, the equine industry had a turnover of $8.4 billion in 2003–04, with the Gold Coast equine industry estimated to be worth $20.7 million, representing 1.5–3 per cent of the market in Queensland (Pacific Southwest Strategy Group, 2005). The strategy notes that the Gold Coast area provides a downstream market for Beaudesert breeders and many other related businesses, value-adding along the way.

The Gold Coast area provides significant opportunities for the equine industry, owing to its proximity to the Magic Millions Sales. The Magic Millions Sales are recognised as the second largest equine business in Australia, with sales exceeding $75 million in 2005 and plans to double the business in the near future.

The keeping of more than 10 horses falls within the animal husbandry definition in the Gold Coast planning scheme, and is a self-assessable use in the rural domain, whether or not the land is identified as good quality agricultural land. Neither the SEQ Regional Plan nor the Gold Coast planning scheme prevent rural lands within the study area from being used for animal husbandry.

5.8 Outdoor recreation

Existing open space areas of habitat significance throughout the region are becoming increasingly restrictive on a range of recreational pursuits that have traditionally been undertaken within these reserves. Private landowners are also becoming less inclined to allow public access to or through their properties due to insurance costs and potential litigation risk. Some of these recreational activities include bushwalking, water based activities (including jet-skiing), mountain bike riding, equestrian, motorcycle sports, 4WD, fishing, camping and model clubs.

These activities provide valuable social and economic development opportunities but are often difficult to locate in urban or near-urban areas.

The study area provides an opportunity to consider the growing need for suitable land for outdoor recreation. These needs include organised sports, tourism and casual recreational pursuits. While these pursuits may not be complementary to existing agricultural activities, the future rehabilitation of extractive industry sites or buffer areas for major developments may allow for the establishment of a significant integrated open space and outdoor recreation network within the study area over the long term. Provision of suitable land for outdoor recreation may also assist to relieve growing pressure on existing open space areas accessible for public recreation within the region.

Section 5.1 of the Gold Coast City Council Economic Development Strategy (EDS) identifies the sport industry as one of nine key industries with the opportunity to leverage off the city’s comparative advantages such as attractive year-round climate, strong sporting infrastructure and beaches and other natural attractions to make the Gold Coast a centre of sporting excellence. Appropriate land and facilities are required to support this industry.
Among the actions proposed in the EDS is the need to create a strategic plan for the motor sport industry. The rapid growth of the urban areas of the Gold Coast has led to increasing conflict between residential uses and some existing motor sports facilities. The main affected facilities include three existing off-road motorcycle racing clubs (Mike Hatcher Junior Motorcycle Club at Arundel, Gold Coast Junior Motorcycle Club at Reedy Creek and Albert District MCC at Stanmore Park) and the Gold Coast Kart Club that ceased its operations at its former facility in Upper Coomera in February 2008. A number of other community motor sport clubs exist within the Gold Coast that either utilise private facilities or partake in activities in venues outside of the Gold coast.

Loss of these facilities without adequate replacement facilities with long-term certainty of use in more suitable locations elsewhere would have detrimental economic impacts, and would also be likely to result in increased illegal off-road motorcycle activities, incrementally increasing noise nuisance and impacts on potentially sensitive ecosystems.

Research into off-road motorcycling in South East Queensland (The Needs of Underage, Unlicensed and Unregistered Trail Bike Riders in South East Queensland, Hibbins R., School of Leisure Studies, Griffith University, 2002) found that the major issue for riders was finding a safe, legal place to ride.

Generally off-road motorcycle riders (many of whom are under 17 years of age) also want these locations to be close to their place of residence. However, there is a fundamental incompatibility between motor sports activities and residential areas, particularly in relation to noise, dust and safety issues, meaning that this proximity is generally difficult, if not impossible, to achieve. Alternative approaches such as providing transport from schools and/or residential areas to more remote motor sports facilities have been canvassed.

Gold Coast City Council has established an intergovernmental working group (IWG) to consider future motor sport facilities, and is seeking to move the three off-road motorcycle racing clubs mentioned into a single site somewhere on the Gold Coast. Due to the availability of large tracts of land, the North East Gold Coast study area is considered to provide some of the only remaining options for such a precinct. Should the i-METT development proposal proceed (see section 3.9.1), there may be advantages in co-locating a community motor sports precinct either within or adjacent to the i-METT development. Other sites will continue to be investigated.

A report prepared for Gold Coast City Council (Planning Principles for Off-Road Motorcycles, Strategic Leisure Pty Ltd, July 2002) provides a checklist of 38 criteria for assessing sites for their suitability for use as an off-road motorcycle venue. It should be noted that these criteria can vary depending on the nature of the off-road motorcycling activity to be undertaken. The following summary of key criteria relates predominantly to three different types of off-road motorcycle racing activities—motocross, speedway and dirt track activities:

- **Site characteristics:**
  - Disturbed lands (such as former quarries or landfills) are often well suited as the landform can be reshaped to meet use requirements.
  - Surrounding land uses such as agriculture, industrial, commercial or open space are preferred to provide buffers to separate the use from incompatible uses such as residential. For track-based motorcycle sports a minimum 1 kilometre separation is preferred.
  - Easy access from the higher order road network is required and access should avoid use of residential streets.

- **Site physical characteristics:**
  - A minimum site size of 10 hectares is required for motocross, dirt track and speedway. However, the Gold Coast Motor sports Club representative to the IWG indicated (notes of IWG meeting, 22 January 2008) that the motocross clubs ideally need 150–200 hectares but can start with 50 hectares if the possibility to expand exists. A minimum site area of 50 hectares could be assumed, with a preference for a site that offers expansion potential beyond this.
Speedway and dirt track prefer fairly level sites and motocross can use flat and/or sloping land. Therefore preference is for a fairly level site. Off-road motorcycling facilities surrounded by steep slopes (hills or quarry walls) may reduce the size of noise buffers required.

Preference is to avoid flood prone sites, sites where drainage can be a problem and sites with numerous natural drainage lines due to potential environmental damage and a general preference for dry tracks and circuits.

Identifying the most appropriate site for these activities would require detailed examination of a wide range of issues including matters such as landowner support, security of tenure and tenure type, as well as a comprehensive environmental impact assessment.

A detailed site selection process is beyond the scope of this study, which is strategic in nature. However, it may be possible to identify areas of potential suitability for subsequent more detailed investigation based on the limited range of site and location criteria outlined above.

It should be noted that development of motor sport facilities for organised off-road motorcycle racing in the north-east corner of Gold Coast City may not help to address unauthorised trail bike riding problems elsewhere in the city.

The issues highlighted for recreational motor sports demonstrates some of the complexities associated with relocating and/or establishing suitable areas for outdoor recreation activities. The study area presents opportunities to provide for the long-term needs of the regional community for a range of outdoor recreation activities.

5.9 General aviation

The Queensland Government, through the Department of Infrastructure and Planning, commissioned a review of South East Queensland’s general aviation (GA) needs from specialist aviation consultants Rehbein AOS. The final report Review of General Aviation Infrastructure Needs in South East Queensland was submitted in September 2007.

The key findings of the report are:

- Access to aircraft maintenance facilities, which in turn require suitably qualified personnel, is fundamental to any GA operation. However it is considered unlikely that there will develop any significant demand for maintenance of Regular Public Transport (RPT) aircraft to be carried out at any airports in SEQ other than those served by the RPT airlines (i.e. Brisbane, Gold Coast and Sunshine Coast airports).

- There are significant opportunities in the area of international pilot training. Asian airlines are currently seeking partner organisations to provide them with a supply of suitably qualified pilots. A number of organisations are actively considering the establishment of facilities for this within SEQ. There would appear to be sufficient demand for between two and four of these facilities in the region. However, without suitable infrastructure it is inevitable that this demand will be satisfied elsewhere. The next 2–5 years will be critical in terms of developing the necessary infrastructure.

- The strong market for private, business and charter operations is likely to continue. This will need to be supported by fixed base operations, including high quality facilities to satisfy the premium end of the market. The nature of private flying, commercially unattractive to many airport operators, appears to be changing and it is considered likely that demand for high-quality support operations will emerge as a result of increasing affluence within the sector.

- Interest in sports and recreational flying appears to be migrating from light aircraft towards the ultralight category. There is a need to retain an accessible network of facilities to serve the sports and recreational aviation sector. However, these activities are largely incompatible with the primary airports and larger GA facilities.

- The helicopter industry in SEQ is extremely strong, with a developing base of training and maintenance activity, and can be expected to remain so. In order to support private, business and charter helicopter activity, there is likely to be a need for a
relatively dense network of helicopter landing sites easily accessible to major activity
centres within the Gold Coast, Sunshine Coast and Brisbane metropolitan areas.

In relation to demand for GA facilities within the Logan–Gold Coast Corridor, the study found
that:

Demand for general aviation facilities in the area between Logan City and the Gold
Coast is less urgent than in the Caboolture–Caloundra area…However, the
increasing pressures on the Gold Coast Airport and, potentially, Southport Aerodrome, mean that such demand is likely to develop within a 20-year period…A
facility in this general location, approximately midway between Brisbane and the Gold
Coast, would be able to serve demand for business, charter and private general
aviation operations from the northern Gold Coast and southern Brisbane urban areas…and would have the potential to accommodate international pilot training
activity. (p37).

In relation to the delivery of infrastructure to satisfy this potential demand for an additional GA
facility, the report recommended that:

the process of master planning and site selection for a secondary (GA dedicated)
airport in the Logan–Gold Coast corridor should be progressed, a suitable site
protected and development partners identified. A number of sites need to be
considered, including existing facilities. (p44).

The report also identified a minor GA facility within the study area. Heck Field has two gravel
runways both approximately 750 metres long and 15 metres wide. It is operated by the Gold
Coast Sports Flying Club. The airfield is located on privately-owned land that could potentially
accommodate expansion of the facilities.

5.10 Industrial land requirements

A review of industrial land supply within Gold Coast City (Industrial Land Capacity Report:
2006 to 2026, Aspect Studios Pty Ltd, November 2006) identified an emerging shortage of
supply across a number of industry sectors.

Based on a brief review of industrial areas within the southern sub-region of South East
Queensland, the study concluded that there will be increasing demand for industrial land in
the Gold Coast, especially within the Yatala Enterprise Area and at Beenleigh. Increasing
demand in these areas was likely because most of the industrial areas to the south of Yatala
have reached or are reaching build-out. The principal exception to this is the Gold Coast
Airport industrial precincts, which may have more than 75 hectares of potential industrial land.

The assessment of industrial land demand and supply was based on a number of
assumptions, mainly relating to development constraints and development intensity. For
example, the review assumed that average site coverage by industrial buildings will be 50 per
cent of total developable area, and that the Q100 flood level would not be a constraint to
industrial development. The review also assumed that the demand for industrial land in Gold
Coast City will not be affected by the establishment of major competitive industrial areas in
Beaudesert or elsewhere in the region.

The report identified that the amount of undeveloped, zoned and developable industrial land
in Gold Coast City as at September 2006 was 994 hectares, comprising 162 hectares of
marine industry land and 832 hectares of general industry land. Marine industry land
requirements are addressed in section 5.6. The following discussion focuses on the land
demand and supply issues for general industry purposes.

The industrial land review found (based on an analysis of planning and building applications)
that the historical take-up of land for general industry purposes averaged 49 hectares per
year between 1996 and 2004. This figure included both general industry and marine industry
for the four years between 1996 and 1999. In the absence of economic forecasts on the
demand for industrial land through to 2031, it seems reasonable to assume an average take-up rate of 50 hectares per year for indicative future demand purposes.

On this basis, the current supply of undeveloped zoned and developable land would be sufficient for around 16 years or until about 2022, and an additional 418 hectares of developable land would be required to meet projected demand for general industry purposes to 2031 (25 years × 50 hectares = 1250 hectares – 832 hectares available as at September 2006 = 418 hectares).

The industrial land review study also undertook a suitability analysis to identify additional areas that may be suitable to address this potential shortfall. The analysis was based on eight criteria: topography, slope < 20 per cent, location in the Urban Footprint (wherever possible), availability of infrastructure, accessibility, proximity to existing industrial precincts, biological constraints and severe flooding issues. The analysis did not consider the potential for other land uses such as low density residential to be converted to business and industry purposes in the future.

The analysis identified potentially suitable industrial expansion areas only at Beenleigh (21 hectares) and the Yatala Enterprise Area (390 hectares, of which 275 hectares is within the Urban Footprint and the balance immediately adjacent to it). The largest of these areas comprises 154 hectares of cane land within the Urban Footprint west of Burnside Road at Stapylton. This area is currently included in the rural domain and identified as good quality agricultural land in the Gold Coast City planning scheme.

5.11 Summary of key economic development issues

The study area’s proximity to the Yatala enterprise area means it has high accessibility to a wide range of employment opportunities.

Employment in agriculture, forestry and fishing is declining in both number of jobs and as a proportion of total employment, but remains the largest employment sector in the non-urban parts of the study area.

The extractive industry sector provides a relatively low level of direct employment, but is significant both as an input to concrete product manufacturers in the Yatala enterprise area and as supply of sand and rock for the construction industry in the South Brisbane-Redland-Gold Coast market area.

Rehabilitation of extractive industry ponds may provide opportunities for environmental, recreational, aquaculture and industry development over the long term. Any development of extractive resources should consider the overlying agricultural resource quality, access to infrastructure and potential impacts on the aquifer storage and recovery area.

Agricultural production in the study area is worth around $25 million per year, distributed across three main industry sectors: sugarcane, plant nurseries and animal production.

The economics of the sugar industry mean that only relatively large producers can operate viably as full-time cane producers. The region’s typically smaller farms are run on a part-time basis (average 650 farmer hours per year for a 66 hectare farm) supplemented by off-farm income.

The long-term viability of the cane industry at Rocky Point is threatened by continued fragmentation of land holdings, and cessation of cane growing by individual (mainly smaller) producers, although some of this land may remain in production via leases to larger producers.
It is not appropriate to identify a minimum threshold of cane throughput below which the Rocky Point mill is no longer viable due to the complex interactions between market forces, climatic variables and other factors, and because the diversification of the mill into ethanol production (using either grain or sugar feedstock) and the production of feedstock for the energy cogeneration plant.

Were the sugar industry to become unviable at Rocky Point, either through closure of the mill for other reasons, there is a range of non-urban options available for the cane lands. These include the option for larger growers to continue growing cane for transport to the Condong mill in northern NSW, a range of alternative crops that varies depending on soil type and water, and other broad acre uses such as turf farms and wholesale nurseries. Regardless of the crop grown, many of the farms in the study area would continue to depend on off-farm income or other value-adding activities.

Market forces will determine whether or for how long the cane industry continues at Rocky Point. Regardless, the productive capacity of the good quality agricultural land in the study area remains and should be protected for the long term as a valuable natural resource and to allow rural producers to invest with confidence.

Despite the introduction of the SEQ Regional Plan, expectations about potential future land uses mean there is a large speculative component in rural land values in the study area. The high cost of rural land prevents aggregation of smaller farms into larger, more viable enterprises as is happening in other agricultural regions.

There is limited potential for the aquaculture industry to expand in the study area. Any such expansion is likely to occur through organic growth of the existing producers.

The marine industry is a major employer and contributor to the Gold Coast economy, and has been identified as a key industry growth sector by the Queensland government and Gold Coast City Council. However there is limited potential for expansion in existing marine industry areas. Steiglitz has been identified as an economic activity centre for investigation as a marine industry precinct. The Marine Infrastructure Master Plan is expected to provide guidance on the amount of marine industry land required and other potentially suitable locations in the study area.

There is increasing demand for sites to accommodate a wide range of outdoor recreation activities that are difficult to accommodate in or near urban areas or in areas with ecological values. While these pursuits may not be complementary to existing agricultural activities, the future rehabilitation of extractive industry sites or buffer areas for major developments may allow for the establishment of significant integrated open space and outdoor recreation networks within the study area over the long term. Current demand exists for a site to accommodate a number of off-road motorcycle activities.

There is no identified demand for an additional general aviation (GA) facility, such as an aerodrome, to serve the Logan–Gold Coast corridor in the short- to medium-term, although demand may emerge over the next 20 years. Site selection for a new GA facility should consider a number of alternative sites, including existing facilities such as Heck Field.

There may be opportunities to meet the significant international demand for pilot training and other general aviation activities such as testing of unmanned aviation vehicles (UAVs) within the study area due to the presence of Heck Field and its proximity to major population centres and universities. However, there would need to be an upgrade of related infrastructure to support these activities.

There is sufficient undeveloped, zoned and developable land in Gold Coast City to meet likely demand for general industry (i.e. excluding marine industry) purposes until around 2022, without considering the potential for converting other land uses within the Urban Footprint to industrial use. In addition there is an area of 154 hectares of cane land within the Urban Footprint at Stapylton that is currently in the rural domain but is potentially suitable for industrial use. The intended future use of this land should be resolved.
6 Existing and planned infrastructure

Map 6.1 shows the existing and planned major infrastructure in the study area. The following sections provide a brief description of the key infrastructure servicing the study area and any plans or proposals for major new or upgraded infrastructure.

6.1 Priority infrastructure plan

Growth in the study area is currently planned in accordance with the Gold Coast City planning scheme, *Our Living City* (2003), including the priority infrastructure plan (PIP) (refer Volume 3 Parts 8 and 9). The PIP is intended to support the preferred land use strategy and provide plans for trunk infrastructure that maintain the adopted desired standards of service in the Gold Coast City Council PIP. It should be noted that the PIP only extends to 2021 as it is a 15-year infrastructure charges strategy.

The PIP provides the planning for trunk infrastructure and sets infrastructure charges for development within the priority infrastructure area (PIA), which is the area to which urban services are planned to be provided within the next 15 years.

Map 6.1 shows those parts of the study area that are included in the PIA. The majority of the study area is outside of the PIA. Areas outside the PIA are not intended to be provided with water supply and other urban services, at least within the planning horizon of the PIP.

6.2 Transport

6.2.1 Roads

The study area abuts the Pacific Motorway (M1). There is a service road along the entire length of the M1 within the study area. Vehicle access from the M1 into the study area is available via several major interchanges. From north to south these are located at:

- Brigade Drive and Saverin Road, Eagleby (Exit 34)
- Distillery Road, Eagleby (Exit 35)
- Jacobs Well Road, Stapylton (Exit 38)
- Mavis Court and Lahrs Road, Ormeau (Exit 41)
- Eggersdorf Road, Ormeau (Exit 45)
- Mirambeena Drive, Ormeau (Exit 45)
- Attenborough Boulevard and Yawalpah Road, Pimpama (Exit 49).

The study area includes part of a proposed intra-regional transport corridor (IRTC) between Nerang and Stapylton-Jacobs Well Road. The IRTC is included in the *SEQ Infrastructure Plan and Program 2008–2026* although corridor preservation only is scheduled for the period to 2026.

However, Gold Coast City Council’s PIP identifies an indicative delivery timeframe of the IRTC in two parts. Council’s schedule of works identifies an indicative timeframe of 2017–2021 for the section of the IRTC between Yawalpah and Foxwell Roads (i.e. immediately south of the study area). The Department of Main Road’s schedule of works in the PIP provides an indicative timeframe of 2006–2021 as the indicative construction period for the Coomera to Nerang section.

Lower level roads within the study area are generally two-lane standard, indirect and with some geometry and visibility issues. Of these, only Stapylton-Jacobs Well Road is state-controlled. DMR is currently planning for the upgrading of Stapylton-Jacobs Well Road to
four-lane urban arterial standard from the Pacific Motorway (M1) to the edge of the Urban Footprint at Burnside Road. The other roads are local government controlled.

The road network is used for a variety of purposes ranging from recreational cycling to haulage of extractive materials and movement of farm equipment between properties. The combination of road quality and range of uses leads to conflicts and safety issues on the local road network which must be considered as part of any infrastructure strategy for the study area.

6.2.2 Public transport

The Brisbane–Gold Coast railway passes through the western part of the study area, with access to the rail service provided through one existing railway station in the study area at Mirambeena Drive, Ormeau.

The existing Ormeau station provides convenient access only to a relatively small area of low density residential development adjoining the station to the west, and is predominantly used by park and ride and bus–rail passengers. The station is located in the inter-urban break between Brisbane and the Gold Coast and is unlikely to be supported by more intense forms of development.

In 2005 Queensland Transport investigated the potential for additional rail station locations on the Brisbane–Gold Coast line between Beenleigh and Robina. The study identified opportunities to preserve four potentially viable station sites at Parkwood, Hope Island, Pimpama and Merrimac. Of these, only Pimpama is located in the study area. Queensland Transport has been using its powers as a concurrence agency under the Integrated Development Assessment System (IDAS) to protect and preserve these sites as future public passenger transport facilities. However, there are currently no state government funding or timing commitments for a future rail station at Pimpama.

Since mid 2006 Queensland Transport has undertaken investigations into the feasibility of an additional railway station at North Ormeau. On January 21 2008 the Minister of Transport, Trade, Employment and Industrial Relations endorsed a future public passenger transport facility (rail station) at North Ormeau adjacent to Eggersdorf Road. The Minister’s endorsement provides in-principle support for the delivery of a rail station in this location subject to further investigations by Queensland Transport into track capacity, rail operations, adjacent land uses supporting mass transit and funding availability.

The existing and potential future rail station sites are shown on Map 6.1.

Gold Coast City Council’s draft Local Growth Management Strategy identifies an additional potential future railway station in the Yatala Enterprise Area. This proposal is not supported by Queensland Transport.

The only scheduled public bus services within the study area are the 563 service that links Eagleby to the Loganholme bus station and to the Beenleigh rail station, and the 567 service that links Beenleigh rail station to Coomera rail station via Yatala and Ormeau.

6.3 Water cycle management

6.3.1 Gold Coast waterfuture strategy

In 2005 Gold Coast City Council adopted a long term Gold Coast Waterfuture Strategy (the GCW strategy), which provides a plan for the sustainable management of water supply across the city over the next 50 years. The GCW strategy was recently updated to reflect changed circumstances due to the current regional drought and other trigger events.
A key initiative of the GCW strategy water balance is potable water source substitution by recycled water Class A+ in dual reticulation areas. The study area includes areas planned for future dual reticulation schemes including Pimpama and Stapylton.

Bulk water planning has been based on the current Gold Coast planning scheme and any increases or changes to the water demand within the study area would have an impact on the GCW strategy water balance.

6.3.2 Northern Wastewater Strategy

Initiated in 1996, the Northern Wastewater Strategy has been reviewed and updated with the following key recommendations:

- Monitor population changes, climate change and land use changes.
- Implement dual reticulation to appropriate areas.
- Encourage use of recycled water for industry, open space irrigation and agricultural irrigation.
- Develop an industrial water strategy.
- Recognise and monitor recycled water demand for the Rocky Point Co-Generation Plant—presently up to 3.7 megalitres per day.
- Encourage more use of recycled water for cane irrigation—presently four farmers are connected with an average use of 0.5 megalitres per day.
- Complete current aquifer storage and recovery investigations.

The Northern Wastewater Strategy has been successful in providing the following major benefits to the northern area:

- upgrading the Beenleigh Wastewater Treatment Plant (WWTP)
- construction of the 360 ML Stapylton Storage Facility (recycled water supplied from Beenleigh WWTP). It is planned to increase the capacity of this facility by an additional 1000 ML
- construction of infrastructure for the irrigation of sugarcane and a palm nursery (recycled water supplied from Beenleigh WWTP via Stapylton storage)
- commencement of the internationally recognised Pimpama Coomera Waterfuture project that provides integrated water management to a 7000 hectare greenfield site.

6.3.3 Recycled water strategy

A citywide recycled water strategy to 2056 is presently being developed in conjunction with a community based advisory committee. The committee has met over an 18-month period to explore the technical, social, environmental and economic implications of the different water recycling, storage and release options. The committee’s proposed strategy will be presented to Gold Coast City Council for consideration in the near future. The study area is included in the scope of the project.

6.3.4 Wastewater treatment plants

The study area incorporates the existing Beenleigh wastewater treatment plant which supplies recycled water to industries within the study area, and proposed sites for the future Pimpama and Stapylton wastewater treatment plant and recycled water treatment plants.

The Pimpama wastewater treatment plant and recycled water treatment plant are due for completion by the mid 2008 and end of 2008 respectively. The Pimpama site is located at Kerkin Road North, just south of the Pimpama River.

Gold Coast Water has commissioned a planning study for the provision of a new wastewater treatment plant and recycled water treatment plant at Stapylton, programmed to be operational in 2011. The proposed site is located at Christensen Road South, just north of Sandy Creek.
Previous investigations have identified a number of site-specific constraints which may affect the extent of land available for development. These include:

- intra-regional transport corridor
- flooding overlay at Sandy Creek
- waterways and wetlands
- public open space.

The planning for the wastewater treatment plants has been based on the current Gold Coast planning scheme. Any changes to land use within the study area that increase or change wastewater characteristics would have an impact on the plant capacity, treatment type and release infrastructure required.

6.3.5 Aquifer storage and recovery scheme

In 2003 Gold Coast Water started investigations to find an underground aquifer that could be used to store recycled water during periods of low demand (wet weather and winter) and extracted for outdoor use during periods of higher demand (summer and dry spells).

The project team is continuing investigations into the preferred aquifer, and is now midway through a multi-stage process to assess its suitability for an aquifer storage and recovery scheme (ASR) which forms part of the Pimpama–Coomera master plan. The ASR investigation area is shown on Map 6.1.

The ASR scheme identifies two aquifers located in the North East Gold Coast study area:

- A shallow aquifer (from ground level to 5 metres below ground level) is used by a number of landholders for a range of uses such as garden watering and cane irrigation.
- A deep aquifer (25 to 40 metres below ground level) also extends over much of this area. However, there are no known uses of this aquifer because of its high salinity.

A clay layer is believed to separate the shallow and deep aquifers, preventing the two aquifers from interacting. The proposed ASR scheme will only use the deep aquifer. The usable storage volume of the aquifer is still being investigated, but it is currently estimated to be approximately 800–1000 megalitres.

The possible continuation of sand mining within the study area has unknown affects on the properties and function of the aquifers. Further investigation is underway to define the deep aquifer extent, hydraulic characteristics and aquitard characteristics. Data collection from pumping tests have been completed and this data will be used to calibrate the numerical model.

If sand mining was to occur in this area, the impacts on the aquifers would need to be investigated further to ensure both sand mining and the ASR scheme could exist together without any detrimental affects on the operations of either activity. Furthermore, consideration is required into how the sand mining may affect the water table of the shallow aquifer that farmers currently use within the area.

It is suggested that prior to any sand mining operations being approved in this area, a full study would be required to assess the impact on the shallow and deep aquifers and how this would affect the existing and proposed uses of the aquifers.

6.4 Energy

The SEQ electricity distribution network is provided and managed by Energex. The study area is included in Energex’s Metro South distribution area. A major transmission line linking the substation at Beenleigh to Stradbroke Island runs approximately east-west across the northern part of the study area.
Energex is proposing to construct a new electricity substation at Stapylton, which will enable increased electricity supply to be provided to rapidly growing areas at Stapylton and Ormeau and elsewhere in the study area. The previous 11kV powerlines from the Yatala substation west of the M1 have already been replaced by new 33kV powerlines in preparation for the new sub-station at Stapylton.

The new 33kV powerlines extend beyond the Stapylton substation along Burnside road to near Rossmans Road. The network will be extended from this point in the future after the construction of the Stapylton substation.

The study area also contains two green energy generators. Energex and Gold Coast City Council cooperated to construct a landfill gas to energy generator at the Stapylton landfill facility. The generator opened in 2002 and generates an average of around 380 000 kWh per month.

The Rocky Point cogeneration plant burns more than 200 000 tonnes of wood and green waste and bagasse (sugarcane waste) which would otherwise go to landfill to generate electricity, steam and hot water. A third of the electricity is used by the neighbouring sugar mill during the harvest crush, usually from July through November, and the rest sold to the grid. Outside the crush, about 95 per cent is sent to the grid.

In the northern Gold Coast, natural gas is reticulated by the Australian Pipeline Trust (APA) for domestic, commercial and industrial purposes. APA is currently expanding its natural gas reticulation network to supply a number of projects around Brisbane South and the Gold Coast.

Further detailed enquiries would be required to ensure that electricity and natural gas reticulation opportunities can be extended to service any new development areas that may be identified in the North East Gold Coast study area.

6.5 Telecommunications

The Gold Coast region’s excellent telecommunications infrastructure delivers access to fibre optic, microwave, satellite and fixed and mobile wireless communications. Providers and managers of telecommunication infrastructure and services include Telstra, Optus and Vodafone, local and national TV and radio, and numerous internet service providers.

Should urban development proceed in parts of the study area, in particular the Steiglitz Investigation Area, further detailed enquiries will be required to ensure that telecommunication upgrade opportunities are extended to include the requirements of any proposed new land uses.

6.6 Waste management and recycling

Gold Coast City Council provides a weekly general waste collection and a fortnightly recyclables collection service to residents in urban areas. Rural residents must take their solid wastes and recyclables to a waste transfer station. Commercial premises can enter into arrangements with private waste contractors. Gold Coast City Council also provides a commercial waste service.

There are two waste transfer stations in the study area at Behm Creek Road, Jacobs Well and Pimpama-Jacobs Well Road, Pimpama. There is also a commercial and domestic waste landfill site at Rossmans Road, Stapylton.

There do not appear to be any particular impediments to the extension of waste management and recycling services to new development areas within the study area. However, more detailed investigations should be undertaken into the requirements of particular development proposals at the detailed planning stage.
6.7 Social/recreational infrastructure

The Queensland Government published SEQ Regional Plan Implementation Guideline No 5: Social Infrastructure Planning in June 2007. The guideline is intended to provide tools to support efficient infrastructure planning, the delivery of regional planning outcomes and to promote a regionally consistent approach to social infrastructure planning.

For the purposes of the guideline, social infrastructure is defined as ‘the community facilities, services, and networks which help individuals, families, groups and communities meet their social needs, maximise their potential for development, and enhance community wellbeing’.

The guidelines include information on comparative rates of provision under a hierarchical model of social infrastructure provision based on three broad levels:

- **local area level**—usually between 5000 and 10 000 people but can be up to 20 000 in some circumstances.
- **district level**—generally between 20 000 and 30 000 people, although can be up to 50 000.
- **local government area-wide level**, or in some cases a sub-regional or regional level.

As outlined in section 3.7 of this report, the total population of the study area in 2006 was around 17 000, and more than half of this population (9365 people) was in Eagleby, which is functionally separated from the main part of the study area by the Albert River.

Given these populations, the local area level of service set out in Table 6.7A provides the appropriate benchmark for community infrastructure provision in the study area, in addition to the basic social infrastructure for new neighbourhoods which the social planning guideline identifies as being a post box, public telephone, park with children’s playground, public transport service, corner shop and a place for the community to meet (e.g. a neighbourhood house or shop).

### Table 6.7A—Comparative rates of provision for local area level social infrastructure

<table>
<thead>
<tr>
<th>Level</th>
<th>Facility</th>
<th>Comparative rate of provision</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local (usually 5000—10 000 people but can be up to 20 000)</td>
<td>Community meeting room/Neighbourhood house</td>
<td>1:2500–3000</td>
<td>Council/private/community</td>
</tr>
<tr>
<td></td>
<td>Multi-purpose hall/local community centre</td>
<td>1:6000–10 000</td>
<td>Council/community</td>
</tr>
<tr>
<td></td>
<td>Child care centre (long day care)</td>
<td>1:500–700 children (0–4 years old), or 1:9500 people</td>
<td>Council/private/community</td>
</tr>
<tr>
<td></td>
<td>Kindergarten</td>
<td>1:16 000</td>
<td>Private/community</td>
</tr>
<tr>
<td></td>
<td>Primary school</td>
<td>1:7500</td>
<td>State</td>
</tr>
</tbody>
</table>

Source: SEQ Regional Plan Implementation Guideline No 5: Social Infrastructure Planning

Map 6.7 presents information from Gold Coast City Council’s community infrastructure database showing the existing community infrastructure in the study area and environs. In addition, Gold Coast City’s PIP includes the provision of two new community centres in the study area, at Calypso Bay in 2018 and at East Coomera in 2019.

Education Queensland is proposing a new high school on the Goldmine Road, Ormeau site shown on Map 6.7. The school is expected to open in 2009–10 and will have capacity to accommodate demand from designated urban areas at Ormeau and Pimpama east of the M1.

Table 6.7B compares the comparative level of provision of key social infrastructure with the existing rate of provision for the main urban communities and villages in the study area (as identified in section 3.8).
As shown in Table 6.7B, the older communities in the study area (i.e. Steiglitz, Jacobs Well and Eagleby) are generally well provided with social infrastructure consistent with the fact that these are mature communities and the community infrastructure has been provided over a long period of time. Steiglitz and Jacobs Well are not provided with public transport. However, this is consistent with their role as small rural townships as opposed to residential neighbourhoods forming part of a larger urban community.

The communities in the study area would need to access higher order social infrastructure in Beenleigh. Access to these higher order services will be enhanced in the future as the range of facilities proposed for the Coomera Town Centre (including TAFE campus and schools, health centre, police, fire and ambulance services) come on line.

The rapidly developing suburb of Ormeau does not display the same high level of social infrastructure provision. This is consistent with other high growth areas in Gold Coast’s northern growth corridor.

Table 6.7B—Comparison of existing and standard rates of provision of social infrastructure

<table>
<thead>
<tr>
<th></th>
<th>Steiglitz</th>
<th>Jacobs Well</th>
<th>Ormeau</th>
<th>Eagleby</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population (2006)</td>
<td>530</td>
<td>1277</td>
<td>4068</td>
<td>9365</td>
</tr>
<tr>
<td>Community meeting place</td>
<td>Not applicable as all communities are served by one or more community centres.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multi-purpose hall/community centre</td>
<td>Guideline: 0 Actual: 1</td>
<td>Guideline: 0 Actual: 1</td>
<td>Guideline: 0–1 Actual: 0</td>
<td>Guideline: 3–4 Actual: 4</td>
</tr>
<tr>
<td>Provision (No.)</td>
<td>Pimpama and Islands District Community Centre at Woongoolba (approx 3 km west).</td>
<td>Local community centre.</td>
<td>Capacity of existing community centres at Ormeau and Pimpama is limited and are west of the M1.</td>
<td>Served by four local community centres.</td>
</tr>
<tr>
<td>Comments</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child care centre</td>
<td>Guideline: 0 Actual: 1</td>
<td>Guideline: 0 Actual: 0</td>
<td>Guideline: 0–1 Actual: 2–4</td>
<td>Guideline: 1 Actual: 4</td>
</tr>
<tr>
<td>Provision (No.)</td>
<td>Adjacent to Woongoolba PS (approx 3 km west).</td>
<td>Four centres in reasonable proximity of which two are west of the M1.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comments</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary school</td>
<td>Guideline: 0 Actual: 1</td>
<td>Guideline: 0 Actual: 0–2</td>
<td>Guideline: 0–1 Actual: 2</td>
<td>Guideline: 1–2 Actual: 2</td>
</tr>
<tr>
<td>Provision (No)</td>
<td>Served by Woongoolba PS (approx 3 km west).</td>
<td>Served by Woongoolba PS and Ormeau PS (approx 7 and 8 km away respectively).</td>
<td>Ormeau PS (located in the suburb of Pimpama) and Livingstone Christian college (both with kindergartens).</td>
<td>Eagleby PS and Eagleby South PS.</td>
</tr>
<tr>
<td>Comments</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: SEQ Regional Plan Implementation Guideline No 5: Social Infrastructure Planning, GCCC Social Infrastructure Data
In recognition of this, the Gold Coast City Council prepared the *Northern Growth Corridor Social Infrastructure Plan 2021* (NGC SIP), which was released in October 2007. This plan identifies the provision of a community centre/hall and other community facilities on the eastern side of the M1 to service suburbs such as Ormeau.

The NGC SIP study area included the suburbs of Ormeau, Pimpama, Coomera, Upper Coomera, Oxenford and Cedar Creek. Of these, only those parts of Coomera and Pimpama east of the M1 are included in the North East Gold Coast study area.

The NGC SIP found that:

…social and community infrastructure and services are underprovided for the current population in the northern growth corridor. Planning for some key social infrastructure is underway including schools, a TAFE campus, health and government sub-precinct, emergency services, library, regional aquatic facility and some local development of community support programs…further detailed and integrated planning is required...

The NGC SIP includes a summary of additional requirements for the distribution of general community facilities across the NGC SIP study area as a guide for more detailed planning. The summary identifies a need for additional district level community centres at Pimpama and Ormeau together with additional local level facilities. The study also identified that access to state high schools from Ormeau is a particular concern, and that Ormeau also has needs for a district health centre, a local youth facility and a range of counselling and support services.

Detailed planning for these social infrastructure facilities and services relates primarily to residential areas within the Urban Footprint. The Terms of Reference for the North East Gold Coast study area make it clear that it is not intended to investigate land within the Urban Footprint, although it will consider the interface between urban areas and Regional Landscape and Rural Production Area.

### 6.8 Summary of key infrastructure issues

Urban infrastructure services are available to all communities and urban land uses throughout the study area, and plans for future expansion and upgrading to 2021 are matched to the planning intents in the Gold Coast City planning scheme. The infrastructure requirements to support major new development proposals (such as an expanded marine industry precinct) would need to be determined through specific detailed investigation.

The IRTC corridor could provide a clear boundary and buffer between urban and non-urban uses in the study area.

Gold Coast City Council is continuing to investigate proposals to improve the reliability of supply of treated wastewater to the study area for agricultural irrigation and other purposes.

Outside the Urban Footprint the local road network is generally of two-lane rural standard, and there are emerging issues associated with conflicts between various user groups that range from recreational cyclists to farm equipment and sand haulage trucks. The extent and cost of any upgrading of the road network required to service new development proposals needs to be carefully considered.
7 Discussion of key issues and options

This section of the paper draws together the key issues that were identified at the conclusions of chapters 3–6, synthesising them and presenting them in summary form under a number of thematic headings intended to provide the context and direction for the development of the draft land use, economic development and infrastructure strategy for the North East Gold Coast study area.

7.1 Strategic direction

The non-urban parts of the study area are predominantly included in the Regional Landscape and Rural Production Area regional land use category in the SEQ Regional Plan. This designation protects important extractive resources of regional significance and good quality agricultural land, as well as the rural character of the area which forms an important inter-urban break between greater Brisbane and the Gold Coast.

Extensive areas of the Regional Landscape and Rural Production Area in the study area are flood prone and unsuitable for urban development, particularly in view of the uncertain rainfall and sea level rise predictions associated with climate change. In addition to flood storage, these areas provide a wide range of other ecosystem services which will become increasingly important in meeting the needs of a growing regional population.

This inter-urban break underpins key growth management strategies for South East Queensland by:

- relieving development pressures on the fragile marine environment of southern Moreton Bay in accordance with the **SEQ Regional Coastal Plan** and the **Moreton Bay Marine Park Zoning Plan**
- supporting the strategic directions in the SEQ Regional Plan and SEQ Infrastructure Plan, including accommodating a higher proportion of regional growth in the Western Corridor (Ipswich) and achieving a more sustainable, compact urban form.

Much of the good quality agricultural land in the study area is currently used for growing sugarcane. A number of groups, including many of the smaller sugarcane producers, question the long-term viability of the sugar industry in the study area. Market forces will determine whether and for how long the sugar industry continues. Regardless of this, the good quality agricultural land is an important resource that should be preserved. The importance of this is highlighted by emerging issues of food and energy security associated with the predicted impacts of climate change and peak oil. This study has identified opportunities for rural landowners to have more flexibility in how they use their land provided the productive capacity is not adversely affected.

Work undertaken by Gold Coast City Council through the draft Local Growth Management Strategy shows that the Urban Footprint contains sufficient residential land to accommodate projected growth to beyond 2026.

Also there is sufficient undeveloped industrial land (other than for marine industry) to accommodate growth to 2022, plus additional opportunities to accommodate further growth without considering the potential to convert other land uses within the Urban Footprint to industry in the future. Gold Coast City Council proposes to undertake detailed studies to formally identify appropriately located land for conversion to industrial purposes to meet the projected requirement by 2031.

There is no identified demand for an additional general aviation facility, such as an aerodrome, to serve the Logan–Gold Coast corridor in the short- to medium-term, although demand may emerge over the next 20 years. It would be prudent to preserve the potential of
the non-urban parts of the study area to accommodate large facilities of this nature that may be required to service the growing sub-regional population in the future.

There is identified demand for additional general aviation industry activities, such as international pilot training and the development and testing of aircraft, such as UAVs. Heck Field Aerodrome may be able to cater for this demand but would need infrastructure upgrades to do so.

The investigations undertaken into the study area and its regional and sub-regional context show that the strategic directions established in the SEQ Regional Plan are broadly appropriate. Emerging issues associated with climate change and peak oil highlight the importance of maintaining and reinforcing the current strategies.

Based on these findings, the broad thrust of the current regional land use allocations should be maintained. More detailed investigations and subsequent recommendations will be limited to the matters identified in the following sections, which include:

- identifying the optimum areas for marine industry use in the study area
- ensuring that the demand for extractive resources from the study area can be met while at the same time minimising impacts on the study area’s important natural values and resources including good quality agricultural land
- amending the Urban Footprint boundary to remove minor anomalies and inconsistencies.

**7.2 Land use and development issues**

The land use and development issues in the study area are grouped under two sub-headings. Spatial issues comprise those that may involve an amendment to the regional land use category boundaries or the inclusion of additional mapped information in the SEQ Regional Plan, and includes any associated information (e.g. infrastructure requirements) that may be required to support the spatial amendments.

The other issues category comprises the issues that are not included in the spatial category.

**7.2.1 Spatial issues**

The extent and nature of marine industry uses at the Steiglitz Investigation Area, and elsewhere in the study area, if appropriate, required to satisfy the demand and locational requirements identified by the Southport Broadwater to Southern Moreton Bay Marine Infrastructure Master Plan study needs to be determined.

The intended future use of the good quality agricultural land adjoining the western edge of the Yatala Enterprise Area that has been included in the Urban Footprint but retained in the rural domain in the Gold Coast City planning scheme needs to be resolved.

The Urban Footprint boundary along the southern portion of the study area should be reviewed to ensure consistency with the existing and likely future extent of urban development.

The potential for the corridor for the proposed Intra-regional Transport Corridor to be used to provide a clear boundary and buffer between urban and non-urban land uses in the study area needs to be considered.

Areas that are potentially suitable to accommodate off-road motorcycle activities or other outdoor recreation activities that are difficult to locate in or near residential areas need to be identified.

Priority areas for extractive industry use that meet the regional demand for sand from the study area need to be identified.
The strategic infrastructure required to support the recommended land use and development strategy for the study area needs to be identified.

### 7.2.2 Other issues

Review the range of acceptable land uses in the good quality agricultural land component of the rural domain table of development. Any change in acceptable land uses should be consistent with the long-term preservation of the productive capacity of the land.

### 7.3 Constraints to development

Future land uses in medium and high risk flood areas (assumed as areas with a predicted flood depth of >0.5 metre from the designated flood affected areas) should be limited to activities that have specific locational requirements such as marine industry which requires a coastal location or extractive industry, or land uses that do not involve large numbers of residents or workers such as agriculture, open space or recreational activities.

Future land uses should avoid or minimise the disturbance of acid sulphate soils wherever practicable.

### 7.4 Values to be protected

Detrimental impacts on the area’s key natural resources—good quality agricultural land and extractive resources—should be minimised wherever practicable consistent with the resolution of the land use and development issues outlined above.

The significant habitat areas in the study area need to be protected and enhanced, including allowing for improved management of surrounding land uses. The priority habitat areas include:

- conservation parks
- Pimpama River Conservation Area
- McCoys Creek catchment
- tidal wetlands including sand flats and saltpan, mudflats and salt marsh and significant coastal wetlands
- waterway corridors
- Coomera-Pimpama Koala Conservation Area (in particular by the removal of inappropriate land use designations and infrastructure servicing intent in the Gold Coast City planning scheme)
- representative eucalypt forest and Remnant vegetation.

The connectivity between remnant habitat areas needs to be protected and enhanced. This includes the need to protect and restore degraded or regenerating areas to restore connectivity to remnant habitats. Priority areas include:

- a regional ecological corridor along the Hotham Creek/Pimpama River/McCoys Creek corridors (the inter-urban break)
- corridors linking significant reserves within the study area—for example, Behm Creek and Pimpama Conservation Reserves
- the Moreton Bay coastline corridor
- remnant vegetation areas in the Pimpama Creek and McCoys Creek corridors and catchments.

The SEQ Coastal Plan recognises important coastal biodiversity values including the Loganholme-Eagleby wetland complex, marine environments at East Coomera, riparian sections of waterways such as McCoys Creek, and undeveloped tidal waterways such as the Logan River. These important values should be protected.
8 References

Australian Academy of Technological Sciences and Engineering (2007) 30/50—The Technological Implications of an Australian Population of 30 Million by 2050: An Overview. ATSE.


CSIRO (2007) Future Use of the Rocky Point Cane Landscapes. CSIRO, St Lucia.

CSIRO (2006) Future Use of the Sunshine Coast Cane Landscapes. CSIRO, St Lucia.


Forster, B. (1989) *Availability of suitable land for sugarcane growing—Rocky point sugar mill area*. Qld Department of Primary Industries.


Gold Coast City Council (2007) *Beenleigh and Sugarcane Land—Heritage and Character Study*

Gold Coast City Council (2007) *Draft Local Growth Management Strategy*.


Gold Coast City Council (2007) *Northern Growth Corridor Social Infrastructure Plan 2021*.

Gold Coast City Council, various documents relating to water supply and wastewater management:

- *Gold Coast Waterfuture Strategy 2006–2056*
- *Gold Coast Waterfuture Strategy*, 2007
- *GCW Northern Wastewater Strategy Volume 2—Appendices*, 1996
- *GCW Northern Wastewater Strategy—Environmental Studies of the Reclaimed Water Scheme*, 2001
- *GCW Northern Wastewater Strategy—Stage 3*, EarthTech, 2006
- *GCW Pimpama Coomera Waterfuture Master Plan*, 2004
- *GCW Pimpama Coomera Waterfuture Master Plan Detailed Report Volume 1, 2 & 3*, 2004
• GCW Strategic Wastewater Category 1 Planning Report, Cardno, 2006
• GCW PIP Stapylton Wastewater Financial Catchment Planning Report, 2006
• GCW PIP Beenleigh Wastewater Financial Catchment Planning Report, 2006
• GCW PIP Pimpama Wastewater Financial Catchment Planning Report, 2006
• GCW Strategic Water Headworks 1 Planning Report HW1, GHD, 2006
• GCW PIP Beenleigh Water Supply Financial Catchment Planning Report, 2006
• GCW PIP Pimpama Water Supply Financial Catchment Planning Report, 2006
• Draft GCW Stapylton Waterfuture Water Balance Report, PB, 2007


Holz (1979) A Sugarcane Land Suitability Study Queensland Department of Primary Industries.


NSW Threatened Species Conservation Act 1995


Rocky Point District Canegrowers Organisation (2007) Briefing to Office of Urban Management


South East Queensland Healthy Waterways Partnership, Report Card 07, October 2007

Standing Committee on Rural and Regional Affairs and Transport (2007) Australia’s future oil supply and alternative transport fuels. Final report


The Australian Academy of Technological Sciences and Engineering (2007) 30/50—The Technological Implications of an Australian Population of 30 Million by 2050

The Biofuels Taskforce (2005), Report of the Biofuels Taskforce to the Prime Minister.


Appendix A—Maps

Please view high resolution maps through the Department of Infrastructure and Planning’s website.
### Appendix B: Threatened or otherwise significant fauna and flora recorded within the study area

<table>
<thead>
<tr>
<th>Name</th>
<th>Status</th>
<th>Habitat requirements</th>
<th>Threats</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Amphibians</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wallum Froglet</td>
<td>EPBC Act—no listing</td>
<td>Restricted to freshwater wetlands in lowland coastal areas of SEQ and northern NSW.</td>
<td>Destruction and degradation of coastal wetlands as a result of urban development, infrastructure, agriculture, exotic pine plantations and sand mining (EPA 2008a; NPWS 2002a). Development in the vicinity of breeding areas leads to changes in water quality (Hero <em>et al.</em> 2000) and hydrological regimes, increasing nutrient loads and weed invasion, inappropriate fire management, competition from invading frog species and predation from introduced fish (EPA 2008a). Use of biocides for weed and mosquito control (EPA 2008a). Reduction of water quality and changes in acidity of coastal wetlands (NPWS 2002a; Hero <em>et al.</em> 2000).</td>
</tr>
<tr>
<td><em>Crinia tinnula</em></td>
<td>Qld NCA Act—vulnerable</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>NSW TSC Act—vulnerable</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Restricted to freshwater wetlands in lowland coastal areas of SEQ and northern NSW.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Habitat can include heath, sedgeland and woodland on nutrient-poor sandy soils. Acidic conditions are essential for breeding habitat in wallum-dependent frog species (Cogger 2000; Hero <em>et al.</em> 2000; EPA 2008a).</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Reptiles</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Green Turtle</td>
<td>EPBC Act—vulnerable</td>
<td>Seaweed rich coastal reefs and inshore seagrass pastures in tropical and subtropical areas of the Australian coast. Migrations recorded from nesting beaches of more than 2600 km, but average around 400 km. It takes 30-40 years for females to reach sexual maturity (EPA 2008b).</td>
<td>Collisions with boats. Marine debris such as plastic bags. Predation of nest sites by feral pigs and foxes (NSW NPWS 2002a). Water pollution. Changes to important feeding and nesting habitats. Accidental drowning in fishing nets. Unsustainable harvesting. Impacts from rising sea levels on nesting beaches (EPA 2008b).</td>
</tr>
<tr>
<td><em>Chelonia mydas</em></td>
<td>Qld NCA Act—vulnerable</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>NSW TSC Act—vulnerable</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Seaweed rich coastal reefs and inshore seagrass pastures in tropical and subtropical areas of the Australian coast. Migrations recorded from nesting beaches of more than 2600 km, but average around 400 km. It takes 30-40 years for females to reach sexual maturity (EPA 2008b).</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stephen’s Banded Snake</td>
<td>EPBC Act—no listing</td>
<td>Coast and ranges from SEQ to the NSW Central Coast. Rainforests and eucalypt forests and rocky areas up to 950 m (NSW NPWS 2002a).</td>
<td>Habitat clearing and fragmentation. Loss of old or dead trees. Frequent wildfire or hazard reduction burns. Illegal collection (NSW NPWS 2002a).</td>
</tr>
<tr>
<td><em>Hoplocephalus stephensii</em></td>
<td>Qld NCA Act—rare</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>NSW TSC Act—vulnerable</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Coast and ranges from SEQ to the NSW Central Coast. Rainforests and eucalypt forests and rocky areas up to 950 m (NSW NPWS 2002a).</td>
<td>Habitat clearing and fragmentation. Loss of old or dead trees. Frequent wildfire or hazard reduction burns. Illegal collection (NSW NPWS 2002a).</td>
</tr>
<tr>
<td>Name</td>
<td>Status</td>
<td>Habitat requirements</td>
<td>Threats</td>
</tr>
<tr>
<td>---------------------------</td>
<td>-------------------------------</td>
<td>--------------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Birds</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glossy Black Cockatoo</td>
<td>EPBC Act—no listing for</td>
<td>Eucalypt forests and woodlands and forests with a canopy or sub-canopy of</td>
<td>Geographic range has continued to decline as a result of habitat</td>
</tr>
<tr>
<td><em>Calyptorhynchus lathami</em></td>
<td>northern subspecies</td>
<td><em>Allocasuarina or Casuarina</em> (RAOU 1992; Garnett and Crowley 2000). Highly</td>
<td>clearing for agriculture and urban development, as well as</td>
</tr>
<tr>
<td></td>
<td>Qld NCA Act—vulnerable</td>
<td>restricted diet of seeds from selected individual she-oaks</td>
<td>selective logging (Clout 1989; RAOU 1992).</td>
</tr>
<tr>
<td></td>
<td>NSW TSC Act—vulnerable</td>
<td>(<em>Allocasuarina and Casuarina</em>). In SEQ, Glossy Black Cockatoos feed mainly on</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>forest oak <em>Allocasuarina torulosa</em> and black she-oak <em>Allocasuarina littoralis.</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Nests in hollows of living or dead trees (Schode and Tidemann 1990).</td>
<td></td>
</tr>
<tr>
<td>Powerful Owl *Ninox</td>
<td>EPBC Act—no listing</td>
<td>Eucalypt forests and woodlands of southeast Australia. Large home-ranges (more than</td>
<td>Destruction of suitable forest and woodland habitat. Loss of old</td>
</tr>
<tr>
<td><em>strenua</em></td>
<td>Qld NCA Act—vulnerable</td>
<td>100 ha). Require hollows (at least 50 cm deep) in large eucalypts. Main prey of</td>
<td>trees and large hollows. Reductions in availability of prey items.</td>
</tr>
<tr>
<td>Black-necked Stork</td>
<td>EPBC Act—no listing</td>
<td>Swamps, mangroves, mudflats, dry floodplains, and irrigated pastures of</td>
<td>Habitat loss and degradation associated with draining and filling of</td>
</tr>
<tr>
<td>*Ephippiorhynchus asio-</td>
<td>Qld NCA Act—rare</td>
<td>northern Australia and sparse in coastal eastern Australia from Queensland to</td>
<td>wetlands. Altered hydrology and water quality (pollution). Use of</td>
</tr>
<tr>
<td><em>ticus</em></td>
<td>NSW TSC Act—endangered</td>
<td>southern NSW (NSW NPWS 2002a).</td>
<td>herbicides and insecticides near wetlands. Removal of suitable nest</td>
</tr>
<tr>
<td>Grey Goshawk *Accipiter</td>
<td>EPBC Act—no listing</td>
<td>Forest areas including riverine forest, vegetated corridors and large bushland</td>
<td>Habitat loss and fragmentation for urban development, infrastructure</td>
</tr>
<tr>
<td><em>novaehollandiae</em></td>
<td>Qld NCA Act—rare</td>
<td>remnants (Queensland Museum 2007; Morcombe 2000).</td>
<td>and agriculture. Activities that reduce woodland bird numbers and</td>
</tr>
<tr>
<td></td>
<td>NSW TSC Act—no listing</td>
<td></td>
<td>diversity.</td>
</tr>
<tr>
<td>Name</td>
<td>Status</td>
<td>Habitat requirements</td>
<td>Threats</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>-------------------------</td>
<td>---------------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Lewin’s Rail <em>Rallus pectoralis</em></td>
<td>EPBC Act—no listing</td>
<td>Subtropical and tropical moist lowland forests. Distribution through south east of mainland Australia and Tasmania (Slater et al., 2005). They inhabit permanent to ephemeral, fresh to saline wetlands that have dense emergent or fringing vegetation. They also use artificial habitats with similar structural features.</td>
<td>Loss of habitat through drainage and river diversion. Degradation of vegetation through grazing, inappropriate burning, or trampling and rooting by stock and feral pigs. Predation by foxes, cats. Death from traffic, mowers, fences, windows, rabbit traps and powerlines (Marchant and Higgins, 1993).</td>
</tr>
<tr>
<td></td>
<td>Qld NCA Act—rare</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>NSW TSC Act—no listing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Square-tailed Kite <em>Lophoictinia isura</em></td>
<td>EPBC Act—no listing</td>
<td>Dry woodland and open forest, particularly along major rivers and corridors in semi-urban areas for hunting, commonly woodland birds. Nest usually in living trees, often near watercourses. Pairs occupy large home ranges of at least 100 km² (NSW NPWS 2002a).</td>
<td>Clearing of forest and woodland habitats. Illegal egg collection and shooting. Activities that reduce woodland bird numbers and diversity such as intensive forestry, agriculture, and frequent fires (NSW NPWS 2002a).</td>
</tr>
<tr>
<td></td>
<td>Qld NCA Act—rare</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>NSW TSC Act—vulnerable</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Little Tern <em>Sterna albifrons</em></td>
<td>EPBC Act—marine and migratory</td>
<td></td>
<td>Coastal beaches, inlets, estuaries, lakes, bays and harbours, particularly where exposed sandbanks and sand spits occur. Breeding habitat includes sand spits or islets in sheltered estuaries as well as sandy ocean beaches and coral cays (EPA 2008c).</td>
</tr>
<tr>
<td></td>
<td>Qld NCA Act—endangered</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>NSW TSC Act—vulnerable</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eastern Curlew <em>Numenius madagascariensis</em></td>
<td>EPBC Act—marine and migratory</td>
<td>Mudflats, sandflats, mangroves, harbours and lagoons in coastal regions in the northeast and south of Australia. Salt pans and sand dunes are used for roosting during high tide (EPA 2008d).</td>
<td>Loss of vital wetland areas used as stopovers during ~10 000 km annual migration from breeding areas in the northern hemisphere. Disturbance due to recreational activities such as 4WD vehicles in dune areas and domestic dogs (EPA 2008d).</td>
</tr>
<tr>
<td>Name</td>
<td>Status</td>
<td>Habitat requirements</td>
<td>Threats</td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>-------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Painted Snipe</td>
<td><strong>EPBC Act—</strong> <em>vulnerable</em></td>
<td>Usually found in shallow inland wetlands, either freshwater or brackish, that are either permanently or temporarily filled, where there is a cover of grasses, lignum, low scrub or open timber. Distribution is scattered throughout Australia, with a single record in Tasmania. (Department of the Environment and Heritage, 2003). Nests on the ground among tall vegetation, such as grasses, tussocks or reeds. The nest consists of a scrape in the ground, lined with grasses and leaves. Forages nocturnally on mudflats and in shallow water for worms, molluscs, insects and some plant matter. (NSW National Parks and Wildlife, 1999)</td>
<td>Clearing of riparian vegetation for agriculture. Drainage, salinisation and pollution of wetlands and waterbodies. Reduced water quality from siltation and pollution. Predation by feral animals such as foxes and cats. Use of herbicides, insecticides and other chemicals near wetlands. Grazing and associated frequent burning of wetlands. Alteration of flooding regimes due to the regulation of inland waterways. Poor representation of inland wetlands in conservation reserves. (NSW NPWS, 1999)</td>
</tr>
<tr>
<td>Rostratula benghalensis</td>
<td><strong>Qld NCA Act—</strong> <em>vulnerable</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>NSW TSC Act—</strong> <em>endangered</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Southern Emu-wren</td>
<td><strong>EPBC Act—no listing for the Qld race</strong></td>
<td>Sedentary resident of temperate and subtropical zones of southern and eastern mainland Australia, from near Gympie, Qld to Shark Bay, WA, as well as Tasmania and several small, offshore islands (Barrett et al. 2003; Slater et al. 2005). It typically occupies low dense vegetation, including wet and dry heathlands, swamps, sedge/rushlands, tussock grasslands, shrublands and open forests with a heath understorey (Higgins et al. 2001).</td>
<td>Habitat loss, degradation and fragmentation associated with land clearing for primary production. Modification of natural drainage systems. Fire. Lack of scientific knowledge on the effect of management practices on swamp habitats. Introduced predators (such as foxes, cats and rats). Loss of genetic variation due to inbreeding in small, isolated populations.</td>
</tr>
<tr>
<td>Stipiturus malachurus</td>
<td><strong>Qld NCA Act—vulnerable</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>NSW TSC Act—no listing</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Name</td>
<td>Status</td>
<td>Habitat requirements</td>
<td>Threats</td>
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<tr>
<td>-------------------------------------------</td>
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</tr>
<tr>
<td>Sooty Owl <em>Tyto tenebricosa</em></td>
<td>EPBC Act—<em>no listing</em></td>
<td>Coastal areas and adjacent ranges of south-eastern Australia from SEQ to eastern Victoria. Rainforests and moist eucalypt forests. Roost by day in tree hollows or dense vegetation. Prey items include small ground mammals, possums and gliders (NSW NPWS 2002a).</td>
<td>Habitat clearing for agriculture and other development. Loss of mature hollow-bearing trees. Use of pesticides (NSW NPWS 2002a).</td>
</tr>
<tr>
<td></td>
<td>Qld NCA Act—<em>rare</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>NSW TSC Act—<em>vulnerable</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mammals</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Koala <em>Phascolarctos cinereus</em></td>
<td>EPBC Act—<em>no listing</em></td>
<td>Eucalypt forests and woodlands of eastern Australia that contain preferred koala food and shelter trees. Forest patches that are reasonably large (at least 50 ha) and well-connected (McAlpine et al. 2006; Rhodes et al. 2008). Preferred koala food trees for the Gold Coast area have been identified as forest red gum (or Queensland blue gum) <em>Eucalyptus tereticornis</em>, tallowwood <em>E. microcorys</em>, swamp mahogany <em>E. robusta</em> and grey gums <em>E. propinqua</em> and <em>E. biturbinata</em> (Biolink 2007).</td>
<td>Habitat loss, fragmentation and degradation associated with urban development in coastal areas (ANZECC 1998; EPA 2006a). Fire. Death or injury from attack by domestic dogs (ANZECC 1998; EPA 2006a). Death or injury when crossing roads (ANZECC 1998; EPA 2006).</td>
</tr>
<tr>
<td></td>
<td>Qld NCA Act—<em>vulnerable</em> (SEQ Bioregion)</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>NSW TSC Act—<em>vulnerable</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water Mouse (False Water Rat) <em>Xeromys myoides</em></td>
<td>EPBC Act—<em>vulnerable</em></td>
<td>Coastal saltmarsh, mangroves and adjacent freshwater habitats on the coast of central and South East Queensland, the coast and nearshore islands in the Northern Territory, and coastal wetlands of Papua New Guinea (EPA 2008e). Forages for crustaceans and molluscs on exposed mangrove substrates and intertidal areas (EPA 2008e).</td>
<td>Habitat loss, fragmentation and degradation associated with urban development, sand mining, land reclamation, use of recreational vehicles. Water pollution resulting from urban runoff, acid sulphate soils, and off-shore pollution events. Predation by feral foxes, pigs and cats (EPA 2008e).</td>
</tr>
<tr>
<td></td>
<td>Qld NCA Act—<em>vulnerable</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>NSW TSC Act—<em>vulnerable</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Name</td>
<td>Status</td>
<td>Habitat requirements</td>
<td>Threats</td>
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<tr>
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<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Plants</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cupaniopsis</strong></td>
<td><em>newmanii</em></td>
<td>Found in subtropical rainforest and warm temperate rainforest and on their margins</td>
<td>Habitat clearing.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Harden <em>et al.</em> 2006).</td>
<td>Invasion of habitat by weeds.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Fire.</td>
</tr>
<tr>
<td><strong>Endiandra</strong></td>
<td><em>floydii</em></td>
<td>Found in and on margins of subtropical rainforest (Harden <em>et al.</em> 2006), littoral</td>
<td>Habitat clearing and fragmentation.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>rainforest or wet sclerophyll forest, often with <em>Lophostemon confertus</em> in the</td>
<td>Low numbers and restricted distribution.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>canopy and occasionally with <em>Araucaria cunninghamii</em> as emergents. It is</td>
<td>Direct impacts of development including edge effects and trampling.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>distributed from Pimpama to Byron Hills (near Byron Bay) (NSW NPWS 2002b).</td>
<td>Invasion of habitat by weeds.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Grazing.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Roadside maintenance.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Poor regeneration and seed dispersal.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Loss of genetic variation.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Collection of propagation material for the nursery industry.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Lack of information about threats (NSW NPWS 2002b).</td>
</tr>
<tr>
<td><strong>Cassia</strong></td>
<td><em>brewsteri</em> var. <em>marksiana</em></td>
<td>Occurs in dry rainforest and lowland subtropical rainforest, from the Brunswick</td>
<td>Land clearing and fragmentation of habitat for urban and agricultural development.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>river to Beenleigh (Harden <em>et al.</em> 2006).</td>
<td>Widening and maintenance of roads.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Browsing and trampling by stock.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Invasion of habitat by introduced weeds.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Damage to trees and inhibition of regeneration caused by seed collectors (NSW NPWS 2002b).</td>
</tr>
<tr>
<td><strong>Baloghia</strong></td>
<td><em>marmorata</em></td>
<td>Found in subtropical rainforest (Harden <em>et al.</em> 2006). Known from the Lismore</td>
<td>Land clearing and fragmentation of habitat for urban and agricultural development.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>district in northeast NSW and the Tamborine Mountains and Springbrook area in</td>
<td>Risk of local extinction because populations are small and distribution is restricted.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>South East Queensland.</td>
<td>Invasion of habitat by weeds.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Trampling by visitors to rainforest remnants (NSW NPWS 2002b).</td>
</tr>
<tr>
<td><strong>Pouteria</strong></td>
<td><em>eerwah</em></td>
<td>Occurs in subtropical rainforest and dry rainforest, north from Boonah area to</td>
<td>Habitat clearing and fragmentation.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Eumundi (Harden <em>et al.</em> 2006).</td>
<td>Invasion of habitat by weeds.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Cattle grazing.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Fire.</td>
</tr>
<tr>
<td>Name</td>
<td>Status</td>
<td>Habitat requirements</td>
<td>Threats</td>
</tr>
<tr>
<td>----------------------</td>
<td>---------------------</td>
<td>--------------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| Randia moorei        | EPBC Act—**endangered**  
Qld NCA Act—**endangered**  
NSW TSC Act—**endangered** | Found in subtropical rainforest and littoral rainforest, north from Lismore district to near Beenleigh (Harden et al. 2006). | Land clearing and fragmentation of habitat for urban and agricultural development.  
Invasion of habitat by weeds.  
Trampling by visitors.  
Fire (NSW NPWS 2002b). |
| Fontainea venosa     | EPBC Act—**vulnerable**  
Qld NCA Act—**vulnerable**  
NSW TSC Act—**no listing** | In dry rainforest, found in the Beenleigh district, near Gympie and the Boyne Valley (South of Gladstone) (Harden et al. 2006). | Restricted and fragmented distribution (Department of the Environment, Water, Heritage and the Arts 2007). |
| Macadamia integrifolia | EPBC Act—**vulnerable**  
Qld NCA Act—**vulnerable**  
NSW TSC Act—**no listing** | Found in drier types of subtropical rainforest, north from Currumbin Creek to Mt Bauple (S of Maryborough) (Harden et al. 2006). They can be found at elevations near sea level up to 600 m, preferring well-drained sites on hill crests, hill slopes, scree slopes, foot slopes and along the edges of hoop pine Araucaria cunninghamii scrubs and creek beds. | Land clearing for agricultural and urban development.  
Grazing and trampling by domestic stock.  
Compaction of soil by stock and vehicles.  
Invasion of habitat by weeds.  
Fire.  
Wind, causing branches to break or trees to fall.  
Low numbers (EPA 2006). |
| Macadamia tetraphylla | EPBC Act—**vulnerable**  
Qld NCA Act—**vulnerable**  
NSW TSC Act—**vulnerable** | Located in coastal subtropical rainforest, north from near Rous (near Lismore) to Mt Tamborine (Harden et al. 2006). | Land clearing and fragmentation of habitat for urban and agricultural development.  
Grazing and trampling by domestic stock.  
Fire.  
Invasion of habitat by weeds.  
Loss of local genetic strains through hybridisation with commercial varieties.  
Risk of local extinction due to low numbers (NSW NPWS 2002b). |

Source: Gold Coast City Council
## Appendix C: Places of local heritage importance

<table>
<thead>
<tr>
<th>Place</th>
<th>Use</th>
<th>Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Eagleby</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>River edge</td>
<td>Transport infrastructure</td>
<td>River crossings Natural environment</td>
</tr>
<tr>
<td>Eagleby Cemetery</td>
<td>Burial</td>
<td>Rural villages</td>
</tr>
<tr>
<td>Beenleigh Cemetery</td>
<td>Burial</td>
<td>Beenleigh: the emergence of a rural centre</td>
</tr>
<tr>
<td>Former Eagleby School</td>
<td>Education</td>
<td>Rural villages</td>
</tr>
<tr>
<td>Mosque (former church)</td>
<td>Worship</td>
<td>Rural villages</td>
</tr>
<tr>
<td>Farm, 193 Eagleby road</td>
<td>Rural building</td>
<td>Sugaropolis and other rural industry</td>
</tr>
<tr>
<td>Farm, 199 Eagleby road</td>
<td>Rural building</td>
<td>Sugaropolis and other rural industry</td>
</tr>
<tr>
<td><strong>Yatala</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gem Hotel</td>
<td>Commercial</td>
<td>Rural villages</td>
</tr>
<tr>
<td>Yatala Drive-in Cinema</td>
<td>Commercial</td>
<td>The post war years</td>
</tr>
<tr>
<td>Farm, 45 MacPherson Road</td>
<td>Rural building</td>
<td>Sugaropolis and other rural industry</td>
</tr>
<tr>
<td><strong>Balance Area</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>St Peters Lutheran Church, Alberton</td>
<td>Worship</td>
<td>Rural villages Migrant place making</td>
</tr>
<tr>
<td>Alberton Cricket Ground, Alberton</td>
<td>Recreation</td>
<td>Rural villages</td>
</tr>
<tr>
<td>Alberton Cemetery, Alberton</td>
<td>Burial</td>
<td>Rural villages</td>
</tr>
<tr>
<td>Mill, 340 Rotary Park Road, Alberton</td>
<td>Rural infrastructure</td>
<td>Rural industry Rural infrastructure</td>
</tr>
<tr>
<td>Cook Island pine tree, Facilies Road, Alberton</td>
<td>Marker</td>
<td>Rural industry South Sea Islanders</td>
</tr>
<tr>
<td>Pimpama Isle Cemetery, 107 Behm Road, Jacobs Well</td>
<td>Burial</td>
<td>Rural villages</td>
</tr>
<tr>
<td>Jacobs Well Environmental Education Centre, 843 Pimpama-Jacobs Well Road, Norwell</td>
<td>Education</td>
<td>Rural villages</td>
</tr>
<tr>
<td>Jacobs Well Camping Reserve</td>
<td>Public reserve</td>
<td>Rural villages</td>
</tr>
<tr>
<td>Jetty, Jacobs Well</td>
<td>Transport infrastructure</td>
<td>Natural environment River crossings</td>
</tr>
<tr>
<td>House, 656 Pimpama Jacobs Well Road, Norwell</td>
<td>Residential building</td>
<td>Settlement in a rural context Sugaropolis and other rural industry</td>
</tr>
<tr>
<td>House, 659 Pimpama Jacobs Well Road, Norwell</td>
<td>Residential building</td>
<td>Settlement in a rural context Sugaropolis and other rural industry</td>
</tr>
<tr>
<td>Farm, 157 Stapylton Jacobs Well Road, Stapylton</td>
<td>Rural building</td>
<td>Sugaropolis and other rural industry</td>
</tr>
<tr>
<td>Cream shed and fig tree, 275 Cabbage Tree Point Road, Steiglitz</td>
<td>Rural building</td>
<td>Sugaropolis and other rural industry</td>
</tr>
<tr>
<td>Bethlehem Lutheran Church, Jacobs Well Road, Woongoolba</td>
<td>Worship</td>
<td>Rural villages Migrant place making</td>
</tr>
<tr>
<td>Pimpama Island and Districts Community Centre, 1220 Jacobs Well Road, Woongoolba</td>
<td>Community events</td>
<td>Rural villages</td>
</tr>
<tr>
<td>Woongoolba State School, 1219 Jacobs Well Road, Woongoolba</td>
<td>Education</td>
<td>Rural villages</td>
</tr>
<tr>
<td>Marks Road Causeway, Marks Road (northern end), Woongoolba</td>
<td>Transport</td>
<td>Roads Natural environment</td>
</tr>
<tr>
<td>Rocky Point Road Causeway, Rocky Point Road (north east end) Woongoolba</td>
<td>Transport</td>
<td>Roads Natural environment</td>
</tr>
</tbody>
</table>

Source: Gold Coast City Council, *Beenleigh and Sugarcane Land—Heritage and Character Study*, June 2007
## Appendix D: Policies in the SEQ Regional Coastal Management Plan

<table>
<thead>
<tr>
<th>SEQ Regional Coastal Plan Policy</th>
<th>Summary of Planning Issues (Refer State Coastal Plan and SEQ Regional Coastal Plan for further detail)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2.1 COASTAL USE AND DEVELOPMENT</strong></td>
<td></td>
</tr>
<tr>
<td>2.1.1 Areas of state significance (social &amp; economic)</td>
<td>The <em>State Coastal Plan</em> provides coastal management direction in relation to areas of state significance (social and economic). There are no areas of state significance (social and economic) in the study, although the Gold Coast Marine Precinct (Coomera) is located just to the south of the study area on the Coomera River.</td>
</tr>
<tr>
<td>2.1.2 Settlement pattern &amp; design</td>
<td>The <em>SEQ Regional Plan</em> provides direction on the regional land use pattern.</td>
</tr>
</tbody>
</table>
| 2.1.3 Coastal-dependent land uses | New marine industry precincts, including the proposed expansion of existing developments, must be located on land designated for urban purposes in a planning scheme. When determining new areas within land designated for urban purposes where marine industry precinct development may occur:  
- areas of state significance (natural resources)  
- areas with an increased risk of flooding and coastal hazards  
- areas where construction and operation will increase tidal prisms, resulting in the need for protection works along tidal waterways (e.g. Coomera river)  
- largely undeveloped tidal waterways (e.g. Logan river floodplains)  
- declared fish habitat areas.  
- are all inappropriate locations unless of net benefit for the state\(^1\)  
  - modelling is undertaken to determine areas where development can occur without adversely affecting tidal prisms and natural hydrology  
  - studies are to be undertaken to determine the net benefit for the state\(^1\) arising from the proposed new or expanded marine industry precinct development, taking into account all economic, social and environmental impacts. Provision of infrastructure which results in impacts on coastal resources must ensure that there is a net gain of coastal resources and values.  

Construction and maintenance of new marine industry precincts must address the provision of land (excluding access channels) for the disposal of dredge-material. |
| 2.1.4 Canals and dry land marinas | New canals and dry land marinas, including the proposed expansion of existing developments, must be located on land designated for urban purposes in a planning scheme. When determining new areas within urban designated land where canals and dry land marina development may occur:  
- areas of state significance (natural resources)  
- waterways with insufficient tidal flushing to maintain water quality  
- areas with an increased risk of flooding and coastal hazards |
## Summary of Planning Issues

*(Refer State Coastal Plan and SEQ Regional Coastal Plan for further detail)*

- areas where construction and operation will increase tidal prisms resulting in the need for protection works along tidal waterways (e.g. Coomera river)
- largely undeveloped tidal waterways (e.g. Logan river floodplains)
- declared Fish Habitat Areas
- Regional Landscape and Rural Production Area of the SEQ Regional Plan. are all inappropriate locations unless of net benefit for the state

- modelling is undertaken to determine areas where development can occur without adversely affecting tidal prisms and natural hydrology.
- studies are to be undertaken to determine the net benefit for the state arising from the proposed new or expanded marine industry precinct development, taking into account all economic, social and environmental impacts. Provision of infrastructure which results in impacts on coastal resources must ensure that there is a net gain of coastal resources and values.

Construction and maintenance of new canals and dry land marinas must address the provision of land within the canals (excluding access channels) for the disposal of dredge-material.

### 2.1.5 Maritime infrastructure

Undeveloped tidal waterways in the region have high environmental, biodiversity, cultural, recreational and tourism values. The construction and use of maritime infrastructure in these undeveloped tidal waterways can result in significant adverse impacts on coastal resources and values. The preference is for new maritime infrastructure to be located in developed tidal waterways in locations that recognise public access requirements and protection of natural and cultural values of the waterway.

New public maritime infrastructure proposals or expansion of existing facilities, including those on state land, should be located in areas where:
- there is a demonstrated public need for the facility
- the facility, associated infrastructure and operational activities, including dredging, are not in areas of state significance (natural resources)
- there will be no adverse impacts on coastal wetlands and biodiversity including those associated with increased marine traffic
- the disposal of dredge-material is consistent with the regional policy on dredging.

### 2.1.6 Extractive industry

The location of future extractive industry operations, including the expansion of existing operations, must be appropriately located and designed to minimise adverse impacts on coastal resources and values, including:
- areas of state significance (natural resources)
- coastal wetlands
- areas of significant coastal biodiversity value
- erosion-prone areas
- vulnerable areas for precursors to algal blooms
| SEQ Regional Coastal Plan Policy | Summary of Planning Issues  
(Refer State Coastal Plan and SEQ Regional Coastal Plan for further detail) |
|---------------------------------|--------------------------------------------------------------------------------------------------|
|                                 | • areas of value to Indigenous traditional owners  
• areas of state significance (cultural heritage).  

The preferred end-use for an extractive industry site located adjacent to or within an area of significant coastal resources is rehabilitation to re-establish coastal resources and values. |
| 2.1.7 Mining and petroleum activities  
(Policy from State Coastal Plan) | Mining and minerals processing industries in Queensland are the state’s single most important source of revenue and help to sustain the economy. When assessing mining and petroleum activities in the coastal zone, the relevant decision-maker is to consider the State Coastal Plan and the SEQ Regional Coastal Plan. |
| 2.1.8 Dredging | The major coastal management issue associated with dredging in the SEQ region is the sustainability of at-sea disposal and viability of land-based disposal of dredge material. Options for both at-sea and land-based placement of dredge material in the SEQ region are being investigated through a joint Queensland Government and industry project. This project will assess all dredge material management options against the potential long-term environmental, social and economic impacts and benefits to ascertain the most viable options for SEQ. |
| 2.1.9 Reclamation  
(Policy from State Coastal Plan) | Reclamation involves the loss of one environment (tidal waters) and the creation of another (land above tidal waters). It can result in the degradation and loss of coastal resources including foreshores, wetlands and wader bird habitats, as well as adversely affecting coastal processes and scenic landscape values. Given the possible substantial changes to coastal resources, the need for any reclamation must be carefully examined, as well as the extent and nature of any potential adverse impacts on coastal resources and their values.  

*Policy*  
Land below the highest astronomical tide is maintained in its natural state and may only be reclaimed where:  
• it is necessary for erosion control or beach nourishment purposes  
• it is necessary for protecting the natural environment and its processes  
• it is for coastal-dependent land uses or other ‘areas of state significance (social and economic)’ and there is a demonstrated net benefit for the state or a region *  
• it is necessary for the operation of a port or harbour *  
• it is necessary for the development of a public or private facility and there is public support and a demonstrated public benefit from the proposal *  
• it is necessary to reinstate land that has been eroded  
• it is for reclamation within a canal or marina.  

Reclamation of tidal waters creates adverse impacts on coastal resources and their values and therefore requires clear justification and the avoidance or minimisation of such adverse impacts.  

* It needs to be demonstrated that there are no alternative sites available that do not require reclamation.
### Summary of Planning Issues
(Refer [State Coastal Plan](#) and [SEQ Regional Coastal Plan](#) for further detail)

<table>
<thead>
<tr>
<th>SEQ Regional Coastal Plan Policy</th>
<th>Tourism and recreation activities</th>
</tr>
</thead>
</table>
| 2.1.10                          | SEQ is one of Australia’s major destinations with most tourism and recreation activities dependent on high quality coastal resources. Recreation and tourism planning for the SEQ region:  
  - provides a range of recreational and nature-based opportunities based on the natural and cultural attributes of the region  
  - identifies and protects sites which are regionally significant for recreation and tourism  
  - identifies and minimises unplanned recreation succession, especially in areas which are regionally significant for recreation and tourism  
  - avoids or minimises (in order of preference) potential adverse impacts, including cumulative impacts, on protected species—in particular, threatened and migratory species.  
  Infrastructure and access points on the coast are to be located and designed to avoid or minimise adverse impacts on coastal resources and values, and managed to maintain the anticipated recreational experience.  
  When determining the levels of infrastructure provided for recreational and tourism purposes on the coast, the potential impact on the use levels and type of area is identified. |

<table>
<thead>
<tr>
<th>Rural land uses</th>
<th>The <a href="#">SEQ Regional Plan</a> provides direction on rural futures and the management of the Regional Landscape and Rural Production Area.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1.12 Managing water resources (Policy from <a href="#">State Coastal Plan</a>)</td>
<td>Water resources are a valuable state resource and uses of water are managed to minimise adverse impacts on coastal processes and coastal ecosystems. In developing water allocation policy in the coastal zone, consideration should be given to the risks of dewatering acid sulphate soils and unsustainable ingress of saline waters into freshwater aquifers.</td>
</tr>
</tbody>
</table>

| Fishing (Policy from [State Coastal Plan](#)) | Queensland fisheries contribute significantly to the state’s economy, particularly through exports. Fishing is also important to the tourism market and as a recreational pursuit for Queenslanders. These sectors often make competing demands for fisheries resources, which has resulted in their depletion.  
  The ecological health and economic and social value of the fisheries resource is protected through careful management of fishing activities, particularly in terms of the protection of endangered or vulnerable species, nursery grounds and feeding areas. |

| Aquaculture (Policy from [State Coastal Plan](#)) | Aquaculture is dependent on a clean, disease-free production environment and is undertaken primarily in the coastal zone. The quality of discharges released from aquaculture activities is dealt with by Environmental Protection Agency under the [Environmental Protection Act 1994](#) and the Environmental Protection Policy (Water).  
  Aquaculture on the coast will be located and undertaken in a manner that results in no significant adverse impacts on the coastal resources and their values. In particular, aquaculture will be undertaken so as to:  
  - maintain water quality  
  - maintain any wastewater discharge to meet relevant standards and requirements. |

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**Summary of Planning Issues**
(Refer State Coastal Plan and SEQ Regional Coastal Plan for further detail)

- maintain groundwater levels and quality
- maintain coastal habitats, such as wetlands and shorebird roost sites, including their protection from potential significant adverse impacts from the disturbance of acid sulfate soil
- have no significant adverse impacts on fisheries (commercial, Indigenous traditional owner and recreational), fishing grounds, or spawning and nursery areas
- maintain natural coastal processes
- be compatible with coastal landscape values and recreational amenity of the area.

Aquaculture developments should be located outside of ‘areas of state significance (natural resources)’ unless it can be demonstrated that there will be no adverse impacts on the coastal resources and their values.

Discharge of wastewater onto the foreshore (land lying between the high water mark and low water mark as is ordinarily covered and uncovered by the flow and ebb of the tide at spring tides) is not supported and should proceed only if there is no feasible alternative and it would not result in significant adverse impacts on coastal resources and their values.

| SEQ Regional Coastal Plan Policy | 2.1.15 Non-tidal artificial waterways  
 INCLUDES artificial waterways, access channels, lakes and other bodies of water where the natural tidal exchange is fully or partially inhibited by a lock, weir or similar structure; or located on low-lying coastal areas, including the coastal flood plain and wetland areas that are not connected to or intended to be connected to tidal water) | New non-tidal artificial waterways, including the expansion of existing development, must be located on land designated for urban purposes in a planning scheme. When determining new areas within urban designated land where non-tidal artificial waterways may occur, areas:  
- with insufficient tidal flushing  
- where construction and operation will alter tidal flows, resulting in potential adverse impacts on tidal waterways, including creating a need for protection works  
- that are undeveloped tidal waterways, in particular the floodplains of the Logan river  
- with freshwater environments, including degraded coastal wetland areas where development involves the introduction of salt water  
- that are declared fish habitat areas. are inappropriate locations. |
| 2.4 WATER QUALITY | 2.4.1 Water quality management | Refer to policy 2.4.1 of the State Coastal Plan. The SEQ Regional Plan also provides direction on environmental values and water quality (section 11.5). |
|  | 2.4.2 Wastewater discharges to coastal waters | Refer to policy 2.4.2 of the State Coastal Plan. Refer also to the Environmental Protection (Water) Policy 1997 and Transport Operations (Marine Pollution) Act 1995. The SEQ Regional Plan also provides direction on environmental values and water quality (section 11.5). |
### Summary of Planning Issues

(Refer State Coastal Plan and SEQ Regional Coastal Plan for further detail)

<table>
<thead>
<tr>
<th>Policy</th>
<th>2.4.3 Waste-disposal facilities</th>
<th>Refer to policy 2.4.3 of State Coastal Plan. The <em>Environmental Protection (Waste Management) Policy 2000</em> establishes a waste management hierarchy. The SEQ Regional Plan also provides direction on waste (section 10.7).</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2.4.4 Stormwater management</td>
<td>Refer to policy 2.4.4 of the State Coastal Plan. The SEQ Regional Plan also provides direction on total water cycle management (section 11.1).</td>
</tr>
</tbody>
</table>
|        | 2.4.5 Groundwater quality      | Refer to policy 2.4.5 of the *State Coastal Plan*.  
  - *The Water Resources Act 2000*  
  - SEQ Regional Plan (section 11.5)  
|        | 2.4.7 Algal blooms             | To minimise the occurrence of harmful algal blooms, development and activities that potentially lead to increases in nutrient loads or alter natural hydrologic regimes in the SEQ coastal zone are to be managed to avoid or minimise the release and movement of nutrients of concern to coastal waters. In particular, best practice water quality management is to be implemented in areas rated with a nutrient export rating of high to very high by detailed algal bloom nutrient hazard maps, when such maps are developed.  
  Model guidelines for identifying and mapping indicative nutrient export areas should be developed. On completion, plans including planning schemes and port land use plans, are to incorporate locally specific mapping that identifies areas of greater risk of nutrient export. Areas of greater risk of nutrient export (if not properly managed) are those rated high to very high by detailed algal bloom nutrient hazard maps (when such maps are developed).  
  The preferred land use types, development and activities for areas of greater risk are those that avoid or minimise alteration to the natural hydrological regime by maintaining existing groundwater levels and avoiding or minimising surface run-off containing nutrients of concern. Planning is to identify measures to reduce site impacts, including run-off controls to minimise export of nutrients of concern, that could potentially lead to the growth of algal blooms associated with agricultural intensification or change in agricultural activities. Measures are to include best practice water quality management (refer to policies under 2.4 Water quality) and criteria listed under development assessment. |
## 2.8 CONSERVING NATURE

### 2.8.1 Areas of state significance (natural resources)

Plans, such as planning schemes and port land use plans, identify areas of state significance (natural resources) as valuable features and include measures to ensure the maintenance, protection and enhancement of the area’s values. In particular, plans are to:

- identify and map areas of state significance (natural resources) and land within 100 metres of a significant coastal wetland, and include these areas within conservation, open space or other land designations that will maintain, protect and enhance values
- ensure land identified for future urban, industry, maritime and rural land uses is located outside areas of state significance (natural resources)
- identify compatible development and activities that will maintain, protect and enhance areas of state significance (natural resources), including land neighbouring or within at least 100 metres from an area of state significance (natural resources).
- Examples of potentially compatible uses and activities may include:
  - Conservation purposes such as low-impact nature-based recreation, nature refuges, conservation areas or other uses where the maintenance and protection of environmental values is the primary objective
  - prevent or limit (in order of preference) further reconfiguration of land
  - require best practice water quality management (refer to policies 2.4.4 and 2.4.5) including water sensitive urban design principles, to avoid direct or cumulative impacts from neighbouring development
  - require the enhancement and rehabilitation of areas of state significance (natural resources), particularly significant coastal wetlands, significant coastal dunes and endangered regional ecosystems
  - require the provision and maintenance of an appropriate buffer between development and an area of state significance (natural resources) to ensure no adverse impacts on the area’s values. The size and type of buffer will be determined by considering the ecosystem function, ecological connectivity, size, values and vulnerability of the area’s coastal resources and values and the potential impacts and threats posed by the development or activity.

### 2.8.2 Coastal wetlands

Plans, such as planning schemes and port land use plans, identify coastal wetlands as valuable features and include measures to ensure the maintenance, protection and enhancement of coastal wetlands and values. In particular, plans are to:

- identify and map coastal wetlands and land located within 100 metres of a coastal wetland for inclusion
- within conservation, open space or other land designations that will maintain, protect and enhance coastal wetlands
- ensure land identified for future urban, industry, maritime and rural land uses is located outside coastal wetlands
- identify compatible development and activities that have limited or no off-site impacts such as: conservation purposes, low-impact nature-based recreation, nature refuge areas or other uses where the protection and maintenance of wetland values is the primary objective in areas neighbouring coastal wetlands
- prevent or limit (in order of preference) further reconfiguration of land require the maintenance, enhancement and rehabilitation of degraded or modified coastal wetlands require best practice water quality management in areas neighbouring coastal wetlands (refer to policies 2.4.4 and 2.4.5) including water-sensitive urban design principles to avoid direct and cumulative impacts from adjacent development.
<table>
<thead>
<tr>
<th>SEQ Regional Coastal Plan Policy</th>
<th>Summary of Planning Issues</th>
</tr>
</thead>
</table>
| 2.8.3 Biodiversity               | Plans, such as planning schemes and port land use plans identify areas of coastal biodiversity significance as valuable features and include measures for their conservation and management. In particular, plans are to:  
  - identify and map areas of coastal biodiversity significance, including areas of state, regional and local biodiversity significance  
  - ensure development does not result in further loss, degradation or fragmentation of areas of coastal biodiversity significance and values  
  - identify compatible development in areas neighbouring those of coastal biodiversity significance that will maintain, protect and enhance these areas and values  
  - identify areas that are degraded between areas of biodiversity significance and require rehabilitation to reinstate habitat values and ecological functioning (refer to policy 2.8.4). |
| Shorebirds and their habitat      | Shorebirds and their habitat, including nesting, feeding and roosting sites, are protected and managed with particular consideration given to minimising adverse impacts from human activities, including personal watercraft, domestic animals and recreational and commercial activities. |
| Marine species of conservation significance and their habitats | Dugong, turtle, dolphin, grey nurse shark and whale populations are conserved by avoiding or minimising human activity and infrastructure impacts, including tourism activities, boating, fishing and marine transport services, particularly in areas located outside of designated turtle and dugong areas. |
| 2.8.4 Rehabilitation of coastal resources | The rehabilitation and enhancement of coastal resources will improve values and functioning of the coastal zone in the future. In the preparation of plans and strategies, including natural resource management plans and catchment management plans, priority for the rehabilitation and enhancement of coastal resources and values within the SEQ coastal zone is to be given to the following areas. General areas for priority rehabilitation and enhancement within the SEQ region:  
  - areas where rare or threatened species or significant vegetation communities or habitat areas are threatened habitat corridors, and foreshore and riparian vegetation  
  - shorebird nesting, roosting and feeding sites  
  - coastal wetlands, endangered regional ecosystems and dunal systems areas subject to fire regimes that have altered the natural structure of the ecosystem;  
  - waterways and wetlands degraded by stormwater run-off and other pollutants;  
  - indicative nutrient export areas rated high to very high, particularly riparian areas  
  - land that has ceased being used for extractive industry or mining purposes is to be rehabilitated to reinstate and enhance the site’s former natural values and ecological functioning as far as practicable, unless approved for an alternative use. In determining rehabilitation requirements, priority is given to re-establishing or enhancing:  
    - locally occurring native vegetation within the erosion prone area particularly along the foreshore  
    - of natural tidal waterways;  
    - locally occurring riparian vegetation along the banks of natural waterways;  
    - coastal wetlands and values; and  
    - wildlife habitats and linking corridors. |