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East Wing Corporation

Hummock Hill Island Development

Initial Advice Statement

A Master Planned Integrated Tourism Community

January 2006

INFRASTRUCTURE | MINING & INDUSTRY | DEFENCE | PROPERTY & BUILDINGS | ENVIRONMENT

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Executive Summary

East Wing Corporation Pty Ltd ("East Wing") proposes to develop an integrated tourism, recreational and residential community on Hummock Hill Island, near Gladstone in Central Queensland. Hummock Hill Island is a mainland island, 30km south–east of Gladstone, separated from the mainland by Boyne Creek, a narrow branch of Colosseum Inlet.

The project will consist of two resort hotels, camping grounds, holiday and residential dwellings, a golf course, education precinct, a commercial centre, and marine commercial facilities. The development will provide public access to beautiful beaches and waterways that are presently accessible only by boat. Recreational facilities will be provided for swimming, boating, fishing, camping, picnicking, bushwalking bowing, tennis, golfing and flying. About two thirds of the development lease will remain undeveloped and managed for conservation values and compatible recreational usage.

The proposed development will provide the strategically important industrial centre of Gladstone and mining areas of Central Queensland with a quality tourist and recreational facility that is not currently available in the Gladstone region. Quality of lifestyle for executives and staff of major industries is a significant problem for employers seeking to attract employees to Gladstone and a major grievance is the lack of high quality recreational facilities and access to good beaches. When the access road and the bridge to the island are constructed, these facilities will be accessible from Gladstone in 30 minutes.

The project will be a significant development for the State of Queensland and the Central Queensland Region in particular:

- Total development value of $825 million over about 22 years, including $125 million in physical infrastructure and $29 million in social infrastructure and recreational facilities;
- 4500 person years of direct employment during this period, with an average of 70 jobs per year until 2029, increasing to 200 jobs per year from 2010;
- The bulk of construction expenditure likely to take place in the local and regional economy, with all of the construction materials able to be sourced from within Queensland;
- A final population (permanent and temporary) of about 4,500, generating about 400 FTE permanent jobs per annum;
- Significant opportunities for skilled and unskilled employment for local residents in both construction and operation;
- Community benefits including greater training and job opportunities for local people in the region, particularly the young;
- An educational centre that will support research in environmental management and provide facilities for residents and tourists to undertake university study programs;

- A new source of tourist attractions in the region which will benefit existing residents as well as increased overall lifestyle attractions of Central Queensland;
- Significant contributions to council in fees and development charges;

The Hummock Hill Island project offers a unique opportunity to develop a tourism-based community founded on strong and sustainable economic and ecological principles. State of the art engineering and architectural designs will minimise impacts on the local environment, minimizing the demand for (and use of) precious natural resources and ensuring long-term environmental sustainability of the development.

The development intends to be in harmony with the natural environment and showcase innovative urban and residential design in relation to energy and water consumption as well as protection of ecosystems. Natural environmental values are a key feature of the Island's setting, being located in the Great Barrier Reef World Heritage Area and Marine Park. Commonwealth and State government policies and standards for environmental protection have been adhered to in Master Planning for the project to ensure that the natural attractions of the Island and surrounding areas are protected for potential residents and visitors and Queenslanders in general.

1. Introduction

1.1 Project Overview

East Wing Corporation Pty Ltd ("East Wing") propose to undertake the establishment of an integrated tourism, recreational and residential community on Lot 3 FD841442, Parish of Rodds Bay on Hummock Hill Island over which East Wing holds Special Lease 19/52155 with an area of 1163 ha. The development comprises two resort hotels, a camping ground, residential and holiday residential development of various forms, a golf course and associated sporting facilities, education precinct, a small commercial centre, and small scale marine commercial facilities.

The project offers a unique opportunity to develop a tourism-based community on a very special part of the Queensland coast. First and foremost, the proposed development will provide the strategically important industrial centre of Gladstone and mining areas of Central Queensland with a quality tourist and recreational facility that is not currently available in the region. The island's natural attractions will be augmented by recreational facilities for activities such as swimming, boating, fishing, camping, picnicking, bushwalking, bowling, tennis, golfing and flying.

Figure 1: View from Headland

The proposed educational centre will support research in environmental management and provide facilities for residents and tourists to undertake study programs linked to a major Queensland university. We believe this may be a first in Queensland, if not Australia.

The project will be developed to the highest environmental standards, utilizing state-of-the-art engineering and architectural designs to minimize impacts on the local environment, to minimize the demand for (and use of) precious natural resources and to ensure long-term environmental sustainability of the development. Environmental management plans will be prepared to monitor and manage any impacts on the surrounding environment identified in the Environmental Impact Assessment stage. At a property level, covenants will be placed on land parcels requiring landowners to retain remnant vegetation, use appropriate sustainable building designs, rainwater tanks and similar measures to minimise the ecological footprint of the development.

The proposed educational centre will support research and the proponent is currently negotiating with the Institute for Sustainable Resources at Queensland University of Technology.

1.2 Project Significance

The proposed Hummock Hill Island development is considered a Significant project under the State Development and Public Works Organisation Act 1971 for the following reasons.

The proposed project is of strategic significance to Central Queensland and the State of Queensland as a whole:

- It will enhance quality of life for residents of Central Queensland, including those of the inland mining communities, by providing a recreational and holiday destination suitable for day and overnight trips as well as longer stays.
- Hummock Hill Island is close enough to Gladstone to allow people to commute, this providing an attractive residential environment to match the increasingly exciting employment opportunities associated with industrial development in Gladstone.
- The project will contribute significantly to the local and regional economy, both in terms of expenditure during construction and operation, and diversification of the economic base.

The investment in major infrastructure and urban services is estimated to be $125 million to be spent in the local, regional and State economies over a 15 year development period. This will include installation of access roads, the bridge, water, power generation and wastewater management and will provide employment for between up to 80 employees per year over this period.

Investment in building construction costs is in the order of $700 million to be spent in the local and regional economy over a period of about 20 years. It is expected that at least 200 persons will be employed per year in building construction activities.

Operation of the proposed development is likely to generate about 400 full time equivalent positions.

- Hospitality and tourism including 2 hotels, a motel, camping grounds, holiday rentals and related transport, retail and food services
- Recreational services including golf course, fishing and boating
- Maintenance services.

Employment in these areas will allow diversification of the regional economy and employment base and provide opportunities for those growing up in the region to remain as residents.

The proposed development at Hummock Hill Island takes the environmental opportunities and constraints into consideration to ensure that the development takes place within the sustainable limits of the environment. The project is located in a sensitive environment where inappropriate or poorly planned and managed development would have irreversible impacts.

The proposed development will require a complex raft of environmental approvals (refer Section 3). Significant consultation and coordination between agencies at the Commonwealth, State and local levels will be necessary to ensure that thorough assessment is undertaken and suitable approval conditions provided.

The development has been planned and designed to comply with Commonwealth, State and local government legislative and policy requirements (refer Section 3). Critically, the proposed development:

- Can be achieved without impacting on the World Heritage values of the Great Barrier Reef World Heritage Area (refer Section 3.3.2)
- Is compliant with the requirements and policies of the State Coastal Management Plan (refer Appendix C1)
- Contributes to achievement of the desired regional outcomes for the Wide Bay and Central Queensland regions, as set out in Regional Growth Management Frameworks for these regions (refer Appendix C2).

Existing regional infrastructure is adequate to support the development. The proposed development will be designed to minimise demands on existing regional infrastructure and services and the proponent will fund upgrades where required. Opportunities to improve infrastructure services to other local communities exist.

1.3 The Proponent

The proponent is East Wing Corporation (ABN 79 000 155 591). The shareholders of the proposed development of Hummock Hill Island are the Scarf and Hatsatouris' families from Sydney, NSW. Over the past 10 years their family companies and associate companies, have been responsible for major property developments in NSW, consisting of: shopping centres; home unit developments; commercial properties with a value of over $250 million.

Recent projects by East Wing Corporation include:

- Shopping complex, comprising cinema complex and 22 shops
- 294 New South Head Road, Sydney – office building with
- Rezoning of land for 70 home units - Port Macquarie
- DA for a Shopping Centre in Gladstone – sold to Advanced
- Development of The City Centre - Market and Pitt Streets,
- The Georges Centre, 45 Cross Street, Double Bay
- Redevelopment of 125 York Street, Sydney
- Redevelopment of 70 Edgecliff Road, Woollahra
- Redevelopment of Edgecliff Post Office into retail and commercial
- 207 Darlinghurst Road, commercial and residential – Darlinghurst.

ML Design
architects
planners
interior designers

MASTER PLAN H (CONTEXT)

HUMMOCK HILL ISLAND

4489-01-B

10/1/2006

NTS

2. Project Description

2.1 Location

2.1.1 Site Location

The project is situated on Hummock Hill Island approximately 30km south of Gladstone (60 km by road) and about 10km south of Tannum Sands which has become a seaside dormitory town for people working in the Gladstone and Boyne Island areas. The island is in Miriam Vale Shire immediately adjacent to the northern boundary with Calliope Shire. The general location of Hummock Hill Island is shown in Figure 2.

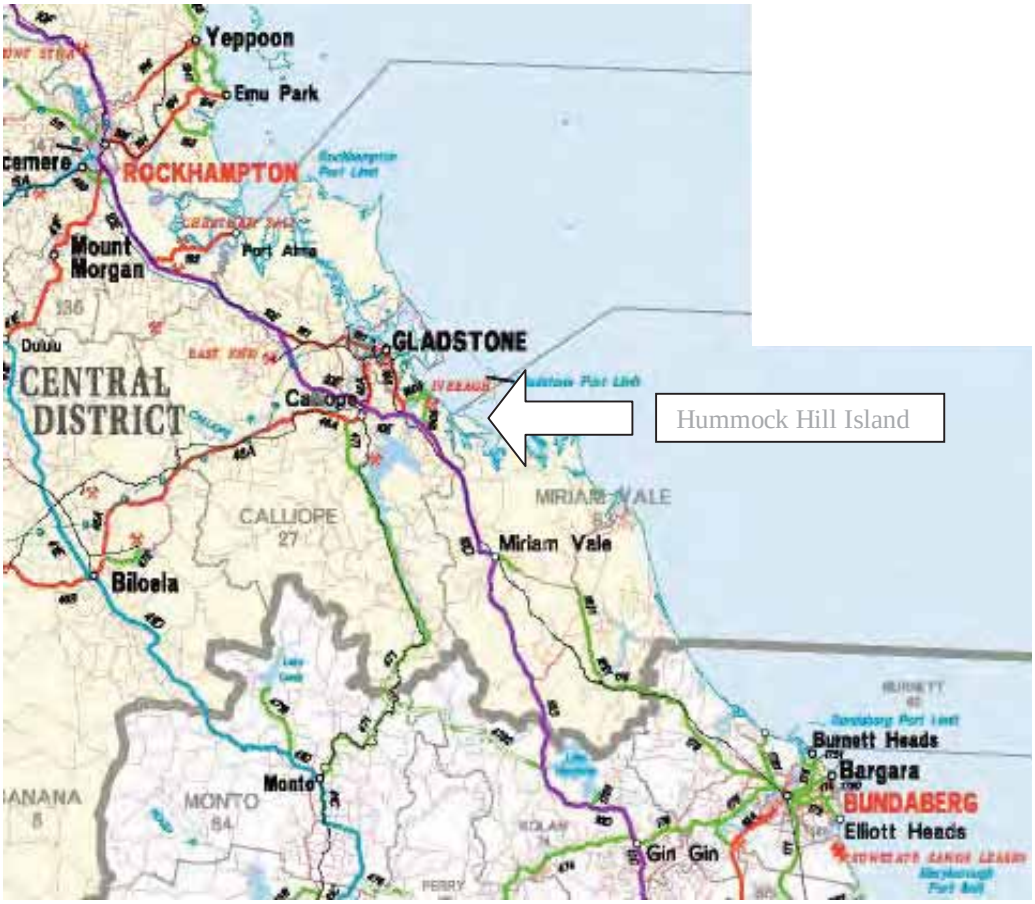

Figure 2: Project Context

2.1.2 Regional Context

The hinterland of the Curtis Coast Region has a total population of 170,000, with a diverse economic profile. It is the most important region of Queensland in terms of export output with major activities in beef and coal production.

The Gladstone Region (which includes the Curtis Coast) is of state and national economic significance. Gladstone, a rapidly growing city of about 27 000 people, is one of Queensland's and Australia's most important ports and industrial centres that has been identified for significant further industrial expansion.

The Gladstone area is a focal point for industrial activity in Queensland with key features supporting its industrial base including:

- The Gladstone State Development Area, a 21,000 ha area set aside for major industrial development. The Gladstone State Development Area is already home to major mineral processing and chemical manufacturing facilities;
- Major industrial developments including an aluminium refinery and the Boyne Aluminium Smelter;
- Gladstone Port, the largest multi cargo port in Queensland and fifth largest port in Australia. Upgrades to this port will make it the largest coal export terminal in Australia;
- Close proximity to major coal and mineral resources of Central Queensland;
- A major power station;
- A major water supply facility Awoonga Dam;
- Connection to the national road and rail network.

Although tourism is not a major activity for the region at present, the Central Queensland region does have a unique variety of natural attractions for the visitor and holiday maker, including:

- The southern end of the Great Barrier Reef Marine Park and islands including
  - Heron Island
  - Wilson Island
  - Lady Musgrave Island
  - North West Island
  - Masthead Island
  - Curtis Island
- National parks including Deepwater National Park, Eurimbula National Park, Kroombit Tops, Isla Gorge, Cania Gorge National Park and Carnarvon Gorge.
- Beaches and coastal communities at Agnes Waters and 1770, some 125 km by road from Gladstone. These communities have shown a rapid growth in the past 5-10 years and appear to be attracting high levels of retired people as well as holiday makers from the region and state. Limitations on services exist particularly water supply and wastewater management, with these towns around 60km from the Bruce Highway.
- Coastal and offshore fishing and boating

- Awoonga Dam which offers boating and picnicking, about 35 km by road from Gladstone.

Figure 3 shows Hummock Hill Island in relation to the Gladstone city.

Figure 3: Regional Context and Proximity to Gladstone

2.1.3 Local Context

Hummock Hill Island is a mainland island separated from the mainland by a narrow inlet and creek system (Colosseum Inlet/Boyne Creek) consisting of mangrove areas, intertidal and sub-tidal mud flats, and a deep sandy channel. The island lies entirely within the Great Barrier Reef World Heritage Area. The high tide mark forms the boundary of the Great Barrier Reef Marine Park. Access to the island is currently via a causeway only useable at very low tide at the end of an unmade road, some 15km from the Bruce Highway.

2.1.4 Land Tenure and Development Lease

East Wing Corporation holds a development lease over the area (refer Section 4.1). The development lease requires that development approvals be substantially progressed by November 2006.

Figure 4: Existing Causeway

Figure 5: View of Hummock Hill Island from North

2.2 Proposed Development

2.2.1 Development Concept

The proposed development is based on an integrated master planned community, with components including:

- Establishment of residential and holiday residential development (approximately 2000 residential lots and units with an estimated population of about 4,000 people) within the nominated development footprint (refer Master Plan H in Section 1).
- A footprint that avoids areas of environmental sensitivity including of concern and endangered Regional Ecosystems, coastal zone and wetlands
- 150 room tourist hotel (4 star)
- 200 room resort hotel
- A campground facility including school camp
- A conference centre and motel

- The development of an 18 hole golf course and associated sporting facilities
- An educational centre focussing on either mining or research and development into sustainable use of the Coastal Zone.
- A Town Centre including low level commercial and retail development, restaurants/cafes and community and professional services.
- A village centre providing local level retail
- A marine commercial precinct associated with the boat ramp and providing services to recreational boating and fishing activities.
- Controlled access to parts of the beach (northern coastline) adjacent to the development footprint and to the beach on Coloseum inlet adjacent to the proposed boat ramp.
- Day visitor parking and facilities including picnic areas.
- Prepared to dedicate a primary school site.

The development will be undertaken and marketed on the basis that:

- 50-60% of the residential properties will be holiday homes/apartments and used by their owners for holidays or rented to holidaymakers.
- 20-30% of the properties will be purchased by persons who will take up employment or business opportunities in servicing the tourism market or by investors who will rent the properties to person employed in the tourism industries on the island
- The remaining 20% of the properties will be sold to persons who will take up permanent residence on the island.

The proposed land uses and areas included in the Master Plan are contained in Appendix A.

2.2.2 Infrastructure and Services

Water supply will be through a combination of rainwater tanks and reticulated water from the Tannum Sands reservoir. Current water balance predictions are that at least 70% of water demand will be met through rainwater tanks. Greywater reuse will occur on larger land lots.

A tertiary wastewater treatment plant will be installed on the Island and treated effluent will be polished to class A and A+ for reuse in irrigation and approved uses via a dual reticulation system. Golf course irrigation water will be entirely sourced from treated effluent.

Wind and solar power and diesel generators will be used to power initial stages of development. Electrical power will be brought in from the mainland once the development population warrants this, however wind and solar generating devices will be retained for ongoing use.

Infrastructure requirements will include:

- A landing strip and terminal facilities for light aircraft (note that a regular commercial service is not anticipated)
- A boat ramp providing access into Boyne Creek adjacent to the proposed bridge. A small jetty or queuing pontoon may be provided subject to Queensland Transport requirements
- A boat ramp providing access into Colosseum Inlet as shown on the attached Master Plan H. A small jetty or queuing pontoon may also be provided at this location subject to Queensland Transport requirements.
- Construction of a bridge across Boyne Creek between the mainland and Hummock Hill Island. The bridge will be located on the alignment of the existing causeway.
- Upgrading of about 7 km of road within an existing road reserve (Clarke's Road) and upgrading of intersections at Turkey Beach Road/Foreshores Road and Intrepid Drive/Clarke's Road as required to allow for projected traffic volumes.
- Establishment of a water main from the mainland to the island along existing infrastructure corridors (high voltage power line, roads). The water main would be intended to supplement rainwater supplies collected at a household level.
- Potential establishment of a desalination plant to provide potable water and supplement rainwater supplies.
- Provision of gas and or electrical power from the mainland to the island along existing infrastructure corridors (roads, high voltage power lines), with potential on-site power generation from wind turbines.
- Electricity, gas, water and wastewater distribution networks within the development footprint
- Stormwater collection and management systems based on principles of Water Sensitive Urban Design (WSUD).
- A network of roads and cycle/pedestrian paths throughout the development footprint
- Social infrastructure including a fire station, police station, ambulance and medical centre to augment facilities already available in the region.

2.2.3 Employment and Expenditure

The proposed Hummock Hill Island development represents a significant economic opportunity for the Central Queensland region, in terms of dollars spent in the region as well as temporary and permanent employment opportunities.

Construction activities associated with the proposed development are expected to create about 4,500 employee years, with typical employment rates for each stage of the project as follows:

- Phase 1 - Major infrastructure - 2007 to 2009: 60- 80 employees
- Phase 2 – Urban services - 2010 to 2015: 30 to 40 employees

- Phase 3 –Urban services – 2016 to 2020: 20 employees
- Building construction – 2009-2029 200 employees

Employment opportunities will include skilled and unskilled positions in engineering design, construction supervision and trades, earthmoving, equipment operation, building and landscaping. Average salary/wage for construction employees is in the order of $75,000 pa.

Estimated expenditure for the 15 year project development program, including provision of infrastructure to Hummock Hill Island and preparation and servicing of land is $125 Million. Itemized costs are shown in Table 1.

Estimated costs of building construction are estimated to be in the order of $700 million as shown in Table 1. This expenditure is likely to occur over about 20 years from 2009.

Table 1 Project Development Costs

Development Component (refer Appendix A)	Estimated Cost
Development Approvals	$1,500,000
Infrastructure: • Access Road to the Island • Bridge over Boyne Creek • Water Supply to the Island • Waste Water Treatment Plant • Power Supply • Solid Waste Transfer Station • Trans Island Boulevard and Trunk Road Services	$28,000,000
Social Infrastructure: • Colosseum Boat Ramp and Jetty • Beachside Public Parks • Retail And Commercial Centre Land • Education Precinct and Community Services Land • Boyne Channel Marine Centre and Boat Ramp • Boyne Channel Home Offices • Airport • Tourist Park • School Recreational Camping Ground • Golf Course • Landscaping	$29,000,000
Resort and Residential Land Development:	$67,000,000
Building Construction Costs	$700,000,000

The project will provide significant stimulation to the local, regional and State economies as most of the materials required for construction, can be locally sourced:

- Sand and aggregates –local quarries
- Cement, steel, bitumen, pipes, structural steelwork, –Gladstone
- Pipes, valves and fittings –Brisbane
- Building materials- Gladstone
- Treatment Plant components- Brisbane/Sydney
- Fuel – Gladstone
- Building materials including bricks, wood, fittings and furnishings – Gladstone.

This will maximise local, regional and State benefits from the project.

Once fully operational, around 400 full time equivalent jobs are likely to be directly generated by the proposed development in areas such as:

- Maintenance workers and operators for infrastructure and services
- Hospitality and recreation
- Retail and commercial activities
- Educational activities
- Cleaners, gardeners.

Economic activity associated with construction and operation will also result in flow on effects in the local, regional and State economies, with increased economic activity and employment.

2.3 Master Planning Context

2.3.1 Development Principles

Three key development principles have been established for this project:

- Natural environment is maintained, protected and enhanced so that areas of conservation significance are retained and the human population can enjoy living in close proximity to, and harmony with the natural ecosystems.
- Social environment will be based on a vibrant, dynamic and diverse community that has a strong environmental awareness and is committed to sustainable living and self development. Individuals and households will come to Hummock Hill Island seeking quality of life in its fullest sense and fulfilling educational and outdoor recreational experiences.
- Built environment will be appropriate to the scale of the development and the natural environmental setting. Infrastructure systems will be based on latest advances in sustainable living, but will be suitable for management and basic maintenance by the householders.

Master planning is the nexus by which elements of the natural, social and built environment will be brought together to form the community of Hummock Hill Island in a way that the development principles outlined above can be attained.

The master plan presented in this document demonstrates a manner in which tourist, urban and semi rural footprints may be integrated with the intrinsic natural beauty of the Island. The final layout of the development has been dictated by the regional ecosystem mosaic across the island and drainage patterns and flows.

The elements of natural, social and built environment that have influenced the Master Plan are described in more detail below.

2.3.2 The Natural Environment

Hummock Hill Island is separated from the mainland by a tidal channel. The channel always contains water, even at low tide, although a causeway has been put in place by previous pastoralists to allow vehicle access at low tide.

Previous disturbance to the Island has occurred as a result of cattle grazing. This activity ceased in the 1980's. Fences, a cattle dip, house and other remnants of this activity remain. An access track remains in reasonable condition and a grass airstrip is still discernible on aerial photographs and on the ground. Regrowth has occurred on some of the grazed areas, however others remain relatively bare of trees, with grasses and weeds providing groundcover.

The natural systems and features of Hummock Hill Island are quite diverse and include:

- Beaches
- Riparian zones incorporating dunes, creeks and dry rainforests
- Rainforests with dune lagoon systems along and behind beach zones
- Open woodland
- Closed woodland
- Endangered and of concern regional ecosystems
- Ephemeral lagoons in lower terrain areas
- Coastal wetlands
- The main central Hummock spine
- The cleared headland to the north east which once supported a house, stockyards and a cattle dip
- Fenced paddocks that have been cleared for cattle grazing
- Mangrove areas and tidal channels.

Features and values of these systems have been taken into consideration when planning for development of the Island, such that those that are less tolerant to disturbance are preserved and enhanced.

Far from being a constraint, the sensitive natural environments of the Island offer excellent opportunities for development that allows residents and visitors to be amongst and appreciate these values. The value of 'inclusiveness' of such natural assets is now recognised as an intrinsic component of property development. This holistic approach is the underlying philosophy of the development strategy. Specific responses to natural environmental features are described in Table 2.

Figure 6: Vegetation of Hummock Hill Island

Table 2 Natural Environmental Features and Development Principles

Feature	Development Principles
Beaches and dunes	No direct disturbance to beaches. Controlled beach access points to be provided through littoral rainforest in dune systems Provide public access to beach Low key public facilities (barbecue, shelters, picnic areas) to be provided away from erosion prone coastal areas
Regional ecosystems	Avoid disturbance to areas where dominant ecosystem is endangered or of concern. Where subdominant ecosystem is endangered or of concern, protect these areas, and linkages between them and manage for habitat value. Provide controlled access to designated conservation areas to ensure that the community can enjoy these areas without damaging them.
Wetlands, drainage lines, lagoons	Minimise alteration of natural catchments and flows Avoid areas that are naturally waterlogged
Slopes and hills	Avoid significant changes to topography Avoid unstable slopes where significant engineering solutions are required to ensure stability
Mangroves and tidal channels	Avoid large scale disturbance Provide boat ramps and jetties with minimal disturbance
Headland	Maximise use of the view from this area
Cleared areas	Maximise use of already cleared areas.

The Master Planning approach to ensuring sympathy and harmony with the natural environment has been to propose a number of different development “units” which provide a combination of high, medium and lower density development and various recreational, educational and commercial activity centres which have been arranged to fit with the natural environmental features. The range of units is shown in Figure 7 and Figure 8.

Archaeological sites have been identified in the form of middens along the eastern end of the northern beaches and a location on the south edge east of the current causeway. Of Concern and Endangered regional ecosystems have been identified in surveys of the site. The surrounding waters include Fish Habitat Area and the Great Barrier Reef Marine Park/Coastal Marine Park.

For Hummock Hill Island, a comprehensive set of controls and guidelines for living within the natural environment will be produced. These are likely to include:

- Building envelopes on larger lots requiring retention of vegetation outside the area designated for construction of houses and outbuildings
- Conservation covenants or similar controls over land of high conservation significance
- Guidelines advising on preferred landscaping species and maintenance of remnant vegetation on and adjacent to residential lots.

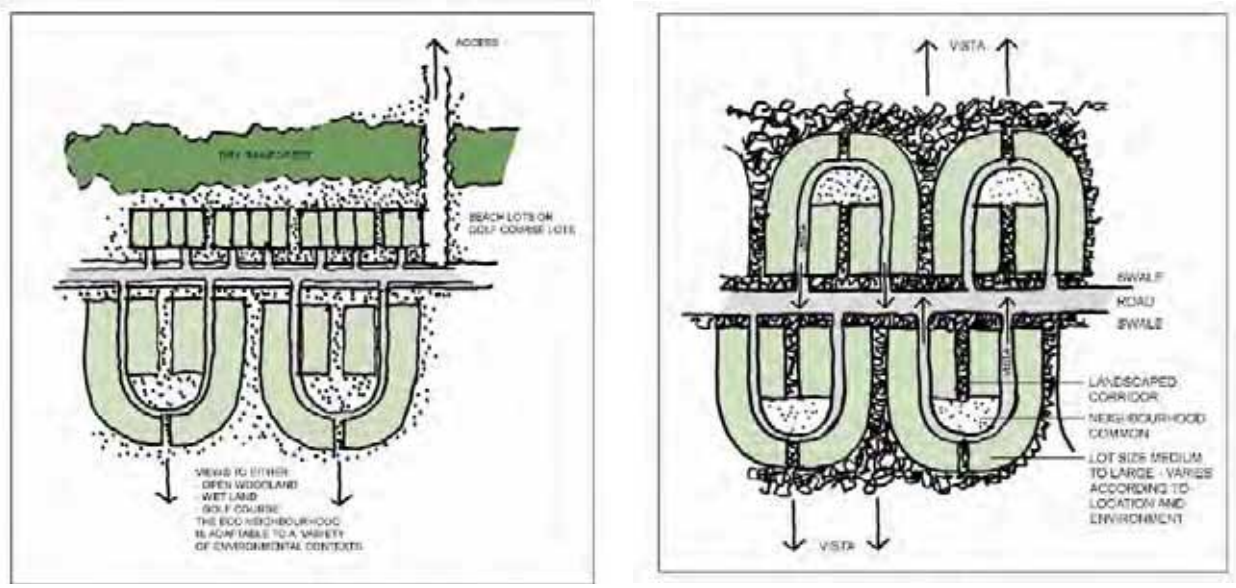

Figure 7: Residential Lots

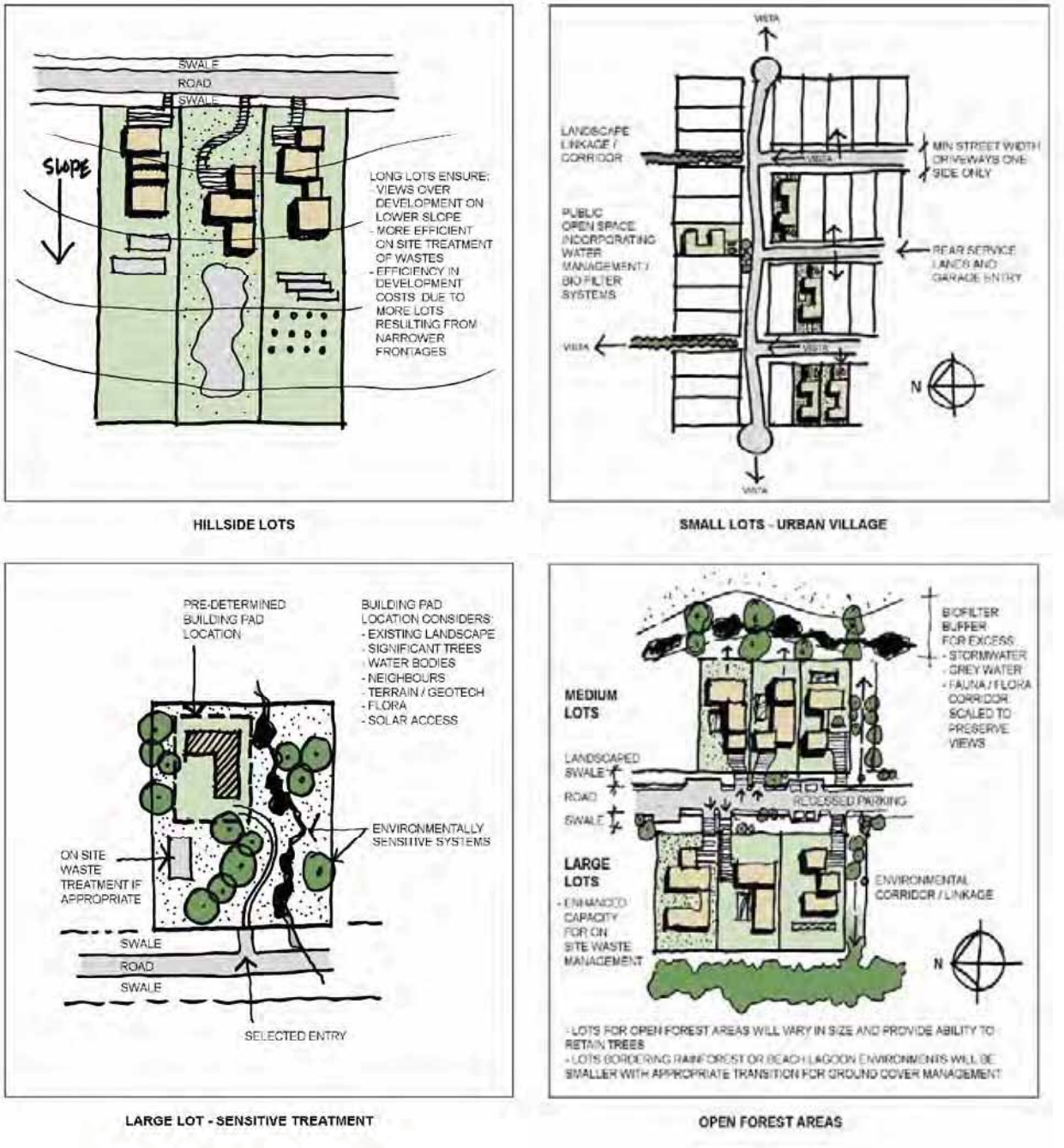

Figure 8: Conceptual Development Units

2.3.3 The Social Environment

The expanding activities and population growth in Gladstone and Central Queensland have created a demand for a 21st century lifestyle that provides high quality amenities in a relaxing and peaceful environment. The sea change phenomenon has created a heightened awareness of living in proximity to the ocean as an antidote to the

commercial and industrial environments that many exist in. At the same time, awareness of the impacts of our lifestyles on the environment is growing and, for the first time, is matched by affordable solutions for sustainable living.

Hummock Hill Island will be able to offer residents and visitors a blend of 21st century lifestyle and synergy with the natural environment that is unique to Central Queensland. Proximity to the regional service and employment centre of Gladstone as well as mining activities in Central Queensland further enhances the attractiveness of the location both for those seeking a recreation and holiday destination, as well as potential permanent residents.

The social environment at Hummock Hill Island is based on achieving social diversity to reflect the natural diversity of the Island. The features of the Island allow the development to offer a range of different lifestyles and activities attractive to both temporary and permanent populations. These will attract a range of different people from retirees to students, members of remote mining communities seeking a coastal retreat and families looking for a high quality coastal destination that is in limited supply in the Gladstone/Central Queensland area.

The anticipated final population of the new community would be 4,000 to 4,500 people including tourists, holiday residents, permanent residents and employees, with the number of properties being in the vicinity of 2000 lots. Staging of the development will allow final population levels to be achieved over a 15-20 year period. This is critical in terms of providing sufficient time for market based drivers to react to increased demand for various services in adjacent urban centres and to avoid sudden increases in populations that might affect social infrastructure planning.

The Master Plan is focused on a Town Centre, with integrated urban neighbourhoods and community facilities providing the necessary sense of activity and destination. A smaller hub at the eastern end of the development near the bridge will provide the necessary balance of amenity and an opportunity for marine commercial facilities associated with the proposed boat ramp, for example, boat storage, fishing supplies and basic boat maintenance.

The overall population size is aimed at creating a community with enough depth and diversity to be largely self-contained, with basic services available on the island. For example, the population of the proposed development, together with nearby developed areas on the mainland would be large enough to attract a General Practitioner and possibly visiting specialists.

Figure 9: Northern Beach Looking Towards Headland

The lifestyle emphasis is on living in a relaxed, sustainable and thoughtfully planned community with a wide range and mix of residents. This range of lifestyles would be provided with choices ranging from:

- Large semi rural lots on flat land
- Recreational (golf course) lots
- Waterfront (beachside) lots (set back from the coastline to protect the Coastal Management District)
- Hillside lots featuring ocean and mountain views
- residential neighbourhoods of various size lots with a strong sense of community
- Village centre with small-scale commercial activities
- Small lot, “urban village” within the town centre
- Medium density units where views are a feature

Recreational opportunities that have been incorporated into the master plan at this stage include:

- Beach access (controlled but available to all) and picnic/barbecue areas
- Golf course, with country club house
- Other sports such as tennis courts, squash courts

- A network of walking/running/cycling tracks including controlled access into areas of conservation significance
- Boating activities supported by boat ramps and small jetties or pontoons (a marina or mooring area is not proposed)
- Passive recreational activities such as scenic lookouts
- A public park in village centre incorporating a bandstand/outdoor performance area.

These will be a mixture of public and private facilities. Full public access will be retained to the beach and coastal zone as well as conservation areas (provided that human access is compatible with the management of these areas). The golf course and some sporting facilities are likely to be privately operated. Recreational and commercial activities will need to cater for a transient population of visitors, both day trippers and longer overnight stays, as well as the resident population.

The 18 hole golf course will be a focus of the recreational aspects of the development, as well as creating desirable residential opportunities adjacent to the golf course by opening up vistas that would showcase the Island.

A key focus of the village centre will be an educational facility that will serve the Island's population as well as attracting participants from the region and beyond.

2.3.4 The Built Environment

The master planning principles identified for Hummock Hill Island require a built environment that is specifically designed to fit the features of the island, while minimising environmental impacts from the development, providing a high quality lifestyle and not draining regional infrastructure services and resources.

Access to the Island will require some upgrading of existing roads and a gateway entry bridge that will provide one end of the axis about which the development will be created. The other end of this axis will be the village centre and resort hotel. In between will be the range of lifestyle and recreational opportunities discussed in Section 2.3.3.

An internal road network of public and private roads will give access to the various components of the developed area. Road design will be sensitive, particularly in relation to maintaining privacy of residential enclaves and neighbourhoods, minimisation of visual impact, compatibility with topography and incorporating drainage measures that minimise velocity and quantity of stormwater and maximise retention of potential pollutants such as soils and sediments.

The concept of the Eco neighbourhood creates limited direct access off the main road system which creates an impression of low density. It is basically a 'module' of predetermined lot sizes and numbers connected by an internal ring road. This modular concept also applies to services, private and public space including a central common, providing immediate access to park areas for recreation within each neighbourhood – (Playgrounds, Ball games, BBQ's, Pool etc).

A network of environmental arteries or corridors / linkages are planned to provide character boundaries to precinct creation and create permeability for residents, link habitat and enhance rainwater management, serving as water treatment, storage and conveyance arteries. The visual amenity provided by this network is coupled with road design to provide green visual corridors and create the general sense of living close to nature that is fundamental to the master plan.

An existing track from the centre of the Island currently crosses the national park to the Colosseum inlet. This offers the opportunity for a jetty or boat ramp to be constructed at the water's edge.

Major environmental impacts of residential development are typically associated with water and energy consumption and waste generation. Solutions for provision of these services are based on maximising self sufficiency at the household, community and Island level, with as little dependence on outside sources as possible, including:

- Water sensitive urban design, which recognises the importance of managing the entire water cycle in urban areas to maintain water quality and other environmental values
- Harvesting of stormwater, particularly through roof top catchments
- Water reuse and recycling at household, community and Island level
- Renewable energy, including solar energy and wind turbines with ultimate grid connection to allow sale back to the grid when demand on the Island allows.
- Waste avoidance measures built into design features
- A waste transfer station that maximises waste sorting and recycling.

Infrastructure alignments would typically follow existing roads and high voltage power easements on the mainland. Within Hummock Hill Island, underground power transmission and other services will minimise visual impact.

At the household level, sustainable housing principles will be incorporated into design controls and guidelines for development of each lot. These will aim at maximising water and energy efficiency and minimising waste generation throughout the lifecycle of the house. "Smart Housing" and "Universal Home" principles will guide both the social and environmental aspects of each dwelling and also yield capital and maintenance cost savings to residents.

The development of lots would be based on a variety of sizes depending on their proximity to environmentally sensitive areas, views, recreation and geography.

Hillside lots could be narrow and long to increase their numbers and yet have a flexibility to retain vegetation by varying the house location. They would also suit waste management due to the longer slope area. Other larger lots would also permit predetermined positioning of house pads to control environmental impacts.

Lots facing rainforest zones or water courses would have strict covenants regarding setbacks and vegetation management. Lot sizes would vary from 1200m^2 to 4000m^2 depending on location and guided by market research.

Architecture for dwellings and other private and public buildings will need to be consistent with the natural features and also provide a high degree of social and visual amenity. Generally, buildings will be designed to integrate with rather than stand out from the landscape and the only significant coastal development visible from the ocean site will be the resort hotel.

A comprehensive set of Architectural, Landscape and Site Management Design Guidelines would accompany all Development Approvals. These approvals would be passed on to all purchasers of land in the proposed development.

An Island maintenance service will also be considered. This would be a private service which home owners could hire to perform a range of maintenance and repair tasks, from total management of the household's water and energy management systems to provision of replacement parts for pumps and other equipment. All services offered by the maintenance service would be consistent with the sustainable "smart housing" principles identified in the master plan.

2.4 Development Activities and Schedule

2.4.1 Project Development Team

The Master Plan and Environmental Impact Assessment is being undertaken by an experienced team of environmental, engineering and project management specialists as shown in Table 3.

Table 3 Project Development Team

Role	Company	Key People
Project management and marketing	Dockside Developments	John Kelly Peter Marshall
EIS, Environmental and Planning Approvals	GHD	Claire Gronow, Michael Scott
Environmental Studies	SKM	Lesley Morris, Ken Gilbert
Master plan and landscape architecture	ML Design	Graeme Thiedeke Brian Toyota
Infrastructure and services	Cardno	Graeme McIlwain
Cultural Heritage	Archaeo	Ann Wallin, Michael Strong
Legal	Philips Fox	Tom Nulty
Survey	Qasco	David Sinclair
Coastal Engineering	Coastal Engineering Solutions	Paul O'Brien

2.4.2 Project Construction and Development Activities

The activities to be undertaken on site to achieve this development are:

- Around $28 million of infrastructure including;
  - 11 km of upgraded access road along Clark's Drive and Foreshores Road
  - A significant bridge over Boyne Creek.
  - Upgrade of Bruce Highway intersection, including deceleration lanes and turning lanes
  - Water supply pipeline from Tannum Sands to the island
  - Power transmission lines from the Ergon HV supply on the Turkey Beach Road
- Construction of boat ramp/pontoon and water supply connection with associated minor excavation in the coastal zone.
- Earthworks associated with the preparation of the site for development including preparation of sites for building construction and road construction. Major changes to the existing landform will not be required and natural landforms will be retained as much as possible. Generally, excavation and earthworks will not result in changes to topography of more than 1-2 metres in flatter areas and 5 metres on hill slopes.
- Construction of internal infrastructure, including roads, cycle/pedestrian paths, water, power, sewerage and stormwater drainage on Hummock Hill Island.
- Landscaping of public areas
- Subdivision of community title lots in community title scheme stages.
- Construction of hotel, residential, commercial, educational and industrial buildings.

2.4.3 Schedule

The proposed development will be undertaken in stages and it is estimated that it will be completed in stages over a 20 year timeframe. Major infrastructure development will occur in Stage I and tourism and educational components of the proposed development will also take priority. A full development program is provided in Appendix B.

3. Legislation & Approvals Context

3.1 State Government Policy Issues

The following State Government policies are relevant to the proposed development:

State Coastal Management Plan, in particular policy areas as follows:

- 2.1.2 Settlement pattern and design
- 2.1.12Managing water resources
- 2.2.2 Erosion prone areas
- 2.3.1 Future need for access
- 2.3.2 Design of access
- 2.4 Water Quality
- 2.5 Indigenous Traditional Owner cultural resources
- 2.8.1 Areas of state significance (Natural Resources)
- 2.8.2 Coastal wetlands
- 2.8.3 Biodiversity

- Regional Growth Management Framework (RGMF) for the Wide Bay Burnett Region, in particular policy areas as follows:
  - 6.1 Remnant native vegetation
  - 6.2 Riparian vegetation
  - 6.3 Native wildlife
  - 6.5 Fish and fisheries
  - 7.1 Places of major environmental and cultural heritage value
  - 8.1 Preferred settlement pattern for region
  - 8.2 Preferred settlement pattern for region
  - 8.4 Residential living opportunities
  - 9.2 Road transport facilities
  - 10.1 Development sequencing
  - 10.2 Regional water supply
  - 10.3 Rural community water and sewage
  - 11.2 Indigenous local heritage
  - 12.1 Community services
  - 12.2 Social impacts
- Central Queensland Regional Growth Management Framework (Central Queensland: A New Millennium) including the following policy areas:
  - Land use planning and management (3.1.1)
  - Coastal planning and management (3.1.9)
  - Existing and emerging industries (3.2.1)

  - Tourism (3.2.13)
  - Regional identity marketing and promotion (3.4.1)
  - Housing (3.4.4)
  - Social infrastructure and social planning (3.4.5)
  - Individual, family and community vitality (3.4.8)
  - Healthy lifestyles (3.4.9)
  - Education and training (3.5.1)
  - Research and development (3.5.3)
- Material Change of Use Policy for Vegetation Clearing NRM, June 2005, Part A.
- *Environmental Protection (Air) Policy 1997*
- *Environmental Protection (Noise) Policy 1997*
- *Environmental Protection (Water) Policy 1997*
- *Environmental Protection (Waste Management) Policy 2000*.
- State Planning Policy 1/03 Mitigating the Adverse Impacts of Flood, Bushfire and Landslide
- State Planning Policy 2/02 Planning and Management of Coastal development Involving Acid Sulfate Soils
- State Planning Policy 1/92 Development of Conservation of Agricultural Land.

Responses to key policies are provided in Appendix C.

Note that a draft Regional Coastal Management Plan for the Wide Bay Burnett Region is currently being developed.

3.2 Approval requirements

Approvals for the proposed development at Hummock Hill Island are expected to be required at Commonwealth, State and local government level. At the State/local government levels, approvals will be required under the *Integrated Planning Act 1997* as well as legislative requirements not incorporated into the Integrated Development Assessment System (IDAS).

A review of applicable legislative requirements is provided in Table 4.

Table 4 Applicable Legislation and Policy

Legislation/Policy	Approval Requirements	Application to Proposed Development
COMMONWEALTH		
Environmental Protection and Biodiversity Conservation Act 1999	Under the EPBC Act a person must not take an action that has, will have or is likely to have a significant impact on a matter of national environmental significance without the approval of the Commonwealth Environmental Minister.	The proposed development may impact on the following matters of National Environmental Significance: • World Heritage Areas (Great Barrier Reef) • Listed endangered, migratory and marine species Referral has been made to Department of the Environment and Heritage with the recommendation that the proposed action be a Controlled Action.
Great Barrier Reef Marine Park Act 1975	Installing a structure in the Marine Park (below low tide mark) Discharging waste into the Marine Park	Boat ramps and a bridge will be constructed in Boyne Creek and Colosseum Inlet and will require placement of structures in the Queensland Great Barrier Reef Marine Park (ie below low water mark). A sewage outfall will be required for disposal of treated effluent when weather conditions preclude land irrigation. This will require a permit for the structure and a permit to discharge to the Commonwealth marine park.
STATE		
State Development and Public Works Organisation Act 1971 (Non-IDAS approval)	An Environmental Impact Statement must be prepared for any project declared a Significant Project under this Act. The Coordinator - General's assessment and attached conditions become a Concurrence Agency Response under IPA.	Application for Significant Project status under this Act has been made.
Queensland Marine Parks Act 1982 *Marine Parks Regulation 1990* *Marine Parks (Great Barrier Reef Coast) Zoning Plan 2004* (non-IDAS approval)	Installing a structure in the Coast Marine Park (between high and low tide) Discharging waste into the Coast Marine Park	Boat ramps and a bridge will be constructed in Boyne Creek and Colosseum Inlet and will require placement of structures in the Queensland Great Barrier Reef Coast Marine Park (ie the land/waters between high tide and low tide). A sewage outfall will be required for disposal of treated effluent when weather conditions preclude land irrigation. This will require a permit for the structure. A permit to discharge will probably not be required as the discharge will be to the Commonwealth marine park (refer above).

Legislation/Policy	Approval Requirements	Application to Proposed Development
Vegetation Management Act 1999 (IDAS approval)	Approval is required for the clearing of remnant native vegetation.	Remnant vegetation is present on Hummock Hill Island including endangered, of concern and not of concern regional ecosystems. The development has been planned to avoid clearing of endangered and of concern vegetation except where absolutely necessary for infrastructure provision. Clearing of not of concern regional ecosystems will be required.
Water Act 2000 (IDAS approval)	Approval is required to conduct operational works that involve disturbance of the bed and banks of a stream. A water allocation is required to extract water from groundwater or surface waters.	There are no permanent freshwater streams on Hummock Hill Island to which the *Water Act 2000* applies. Mainland water supply pipeline alignments may include crossings of freshwater streams to which the *Water Act 2000* would apply. There is no intention to extract water from aquifers or surface waters.
Aboriginal Cultural Heritage Act 2003	Disturbance of Aboriginal cultural heritage material can only be undertaken in accordance with an approved Cultural Heritage Management Plan (CHMP). A CHMP is required for any project for which an Environmental Impact Assessment is undertaken.	There is Aboriginal cultural heritage material on Hummock Hill Island. A Cultural Heritage Management Plan is required as the project will undergo an Environmental Impact Assessment.
Native Title Act 1993 (Cth) *Native Title (Queensland) Act 1993*	An Indigenous Land Use Agreement (ILUA) is required if works are to be undertaken on land subject to Native Title.	NT has been extinguished over lot 3 (development lease). Infrastructure such as the bridge and road corridors will be dedicated as road reserves and thus not be subject to Native Title.
Fisheries Act 1994	Resource Allocation Authority for any disturbance within a Fish Habitat Area. (non-IDAS approval) Operational Works or Building Works within a Declared Fish Habitat Area (IDAS Approval) Operational Works Development Permit for the trimming or removal of Marine Plants. (IDAS Approval)	Colosseum Inlet boat ramp will require Resource Allocation Authority and Operational Works due to disturbance to Colosseum Inlet FHA. Note that the area 100m on either side of the centreline of the existing access track and causeway is excluded from the FHA and thus approvals for the bridge crossing and Boyne Channel boat ramp are not required. Trimming and removal of a small number of mangroves on Boyne Channel will require Operational Works approval. Disturbance to mangroves on Colosseum inlet can be avoided.
Environmental Protection Act 1994 (IDAS Approval)	Development Approval for carrying out Environmentally Relevant Activities (ERAs)	Development Permit for ERA 15 Sewerage Treatment Plant and Operator Registration Certificate.

Legislation/Policy	Approval Requirements	Application to Proposed Development
		Development Permit for ERA 16 – Water Treatment if any on-site potable water treatment is proposed.
Transport Infrastructure Act 1994 (IDAS Referral)	Development not contiguous to a State-controlled road that exceeds the threshold must be referred to Main Roads.	Traffic studies to be undertaken to determine whether threshold is exceeded on Bruce Highway. Not likely to apply.
Coastal Management and Protection Act 1993	Resource Allocation. (non-IDAS Approval) Operational Works Development Permit for Tidal Works. (IDAS Approval)	Required for excavation of material from Colosseum Inlet and Boyne Channel as part of bridge and boat ramp construction.
State Planning Policy 2/02 - Planning and managing development involving acid sulfate soils (IDAS Referral)	Development involving: excavating more than 1000m^3 of soil or sediment; or using more than 1000m^3 of material as fill Must be referred to Department of Natural Resources and Mines.	Excavation of acid sulfate soils will occur for construction of boat ramp and bridge crossing at Boyne Channel. Quantity of ASS/PASS to be excavated to be confirmed but likely to exceed 1,000 m^3. Advice of Queensland Acid Sulfate Soils Investigation Team (QASSIT) to be sought in any case due to sensitivity of receiving environment.
State Coastal Management Plan (IDAS referral)	Demonstrate compliance with policies set in the Management Plan. Note that a Regional Coastal Management Plan has not been developed for the Wide Bay-Burnett Region.	Relevant policies have been identified in the Draft Terms of Reference (refer Appendix D). A discussion on the application of the State Coastal Management Plan to the project is provided in **Appendix C**.
Regional Growth Management Frameworks: Central Queensland A New Millennium and Wide Bay 2020	Demonstrate consistency with outcomes sought in each of the RGMFs.	Hummock Hill Island is located on the northern boundary of the Wide Bay Region with the Central Queensland Region.
LOCAL		
Miriam Vale Shire Council Planning Scheme (IDAS approval)	Development Permit for Material Change of Use, Reconfiguration of a Lot and Operational Works.	Site is zoned rural under current Transitional Planning Scheme. Note that the IPA compliant planning scheme is being drafted and due for release for public comment early in 2006. It is not yet clear whether the Development Approval application for the proposed Hummock Hill Island development will be made under the transitional scheme or the IPA compliant scheme.

3.3 Approvals Process

3.3.1 Overview of Commonwealth, State and Local Approvals Process

As identified in Section 3.1, the proposed Hummock Hill Island development will require environmental and planning approvals under Commonwealth, State and local laws.

Assessment as a Significant Project under the *State Development & Public Works Organisation 1971* (SDPWOA) requires an EIS.

The project has also been referred under the *Environment Protection & Biodiversity Conservation Act* (EPBC Act) with the recommendation that the project be designated a Controlled Action on the basis that it takes place within the Great Barrier Reef World Heritage Area.

A Bilateral Agreement exists between the Commonwealth and Queensland governments allowing a joint assessment process to be undertaken for these two Acts.

The outcome of the SDPWOA EIS process will be a Coordinator-General's Report, recommending whether the project should proceed or not. If recommended to proceed, the Coordinator-General's Report will contain any conditions required by the Coordinator-General or any of the State and local government referral agencies involved in review of the EIS. The Coordinator-General's Report then fulfils two further functions:

- As an Assessment Report, it is forwarded to the Commonwealth Department of the Environment and Heritage for consideration in the application for approval under the EPBC Act.
- As a Concurrence Agency Report, it forms the basis for subsequent approvals under the Integrated Planning Act (ie IDAS approvals identified in Table 4).

The Commonwealth Minister for the Environment may approve or reject the project and, if approved, may also place conditions on the project.

At the State/local government level, the proponent must submit a Development Approval Application and the IPA Assessment Manager (most likely Miriam Vale Shire Council) and referral agencies (for example EPA, DPI&F) must issue Development Approval that substantially mirrors the Coordinator-General's conditions.

Several other non-IDAS approvals are also required. These are discussed in Section 3.3.5.

3.3.2 EPBC Act

As discussed above, referral has been made to Department of the Environment and Heritage under the EPBC Act, recommending that the proposed Hummock Hill Island development is a Controlled Action. The controlling provision for the Action is Part 3 Division 1 Sections 12 and 15A, being that relating to World Heritage Areas.

While there is also potential for listed threatened species and migratory species to occur on and adjacent to Hummock Hill Island, the proposed development is not likely

to have a significant impact on these, given the lack of directi disturbance of habitat and environmental protection measures proposed to avoid indirect disturbance.

Once the project is designated as a Controlled Action, the process for EPBC Act assessment under the bilateral agreement is as follows:

- Agree on assessment under a Bilateral Agreement. Agree on the assessment process.
- Agree on Terms of Reference for EIS. (A draft Terms of Reference that satisfies both Commonwealth and State government a requirement is provided in Appendix C).
- Commence State and Commonwealth assessment.
- Conduct assessment as per State approvals pathway (refer Section 3.2).
- Coordinator – General submits assessment report to Department of

  the Environment and Heritage.
- Minister for Environment seeks views for any relevant Commonwealth Ministers and relevant agencies such as GBRMPA.
- Minister issues/refuses approval.

Figure 10 shows the EPBC Act assessment process. The pathway under a bilateral agreement has been designated with ticks.

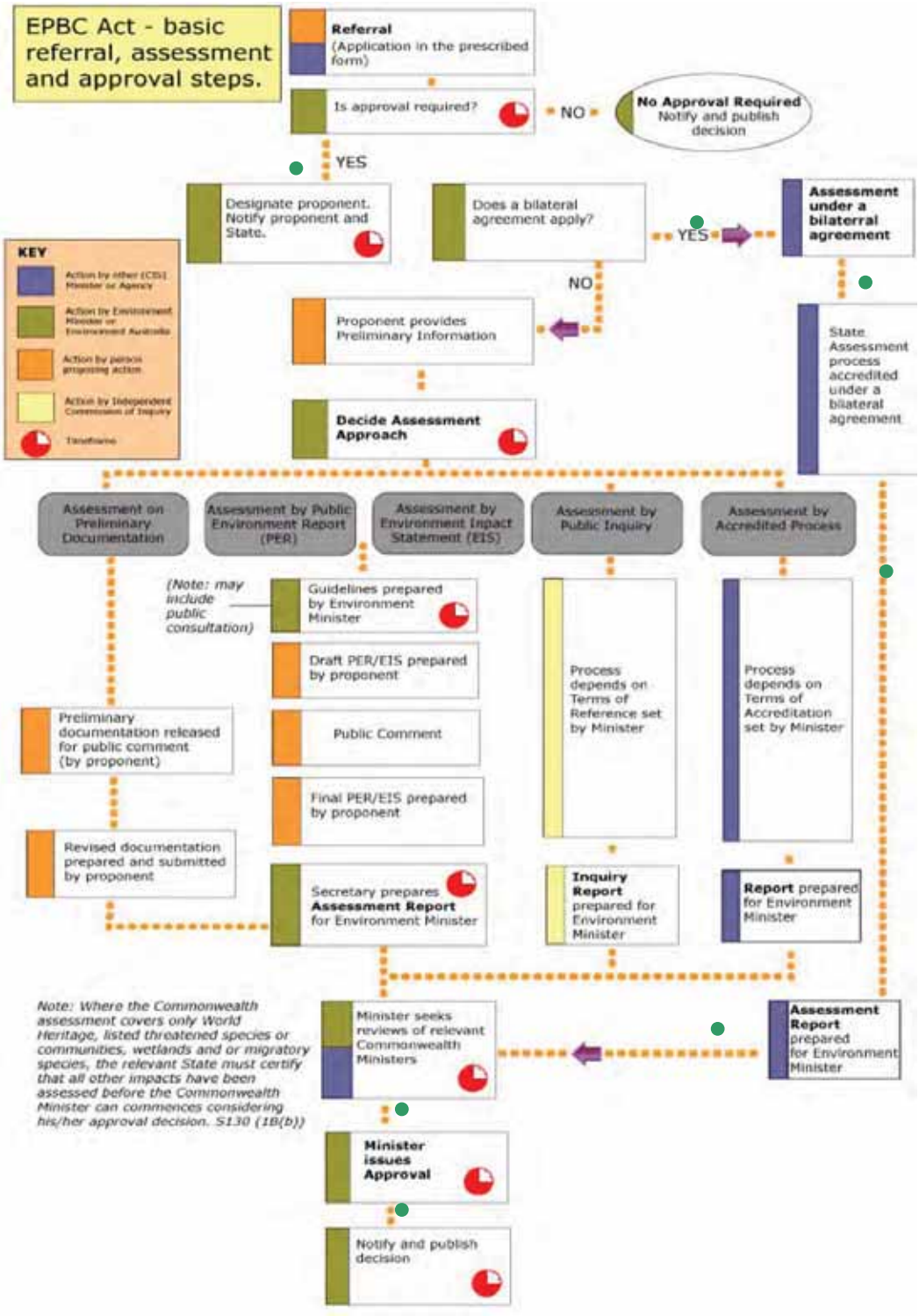

Figure 10: EPBC Act Approval Process

3.3.3 SDPWOA Approval

While there is no formal statutory process for Environmental Impact Assessment conducted under this Act, steps in the process are typically:

- Proponent prepares and submits an Initial Advice Statement (this document)
- The Coordinator-General considers the project against the criteria for a Significant Project under Section 27 of the Act
- Terms of Reference for the EIS are prepared and agreed with the Coordinator-General's office
- The Draft Terms of Reference are publicly advertised and distributed to relevant State government referral agencies and Department of the Environment and Heritage
- Terms of Reference are finalised, taking into account any comments received.
- An EIS is prepared in accordance with the requirements of the Terms of Reference
- The EIS is reviewed and accepted by the Coordinator-General (or delegate)
- The EIS is placed on public exhibition and is provided to all relevant State Government referral agencies and Department of the Environment and Heritage for a period of 4-6 weeks.
- Comments from members of the public and referral agencies are submitted to Coordinator-General. Department of the Environment and Heritage may also submit informal comments on matters of National Environmental Significance.
- The Coordinator-General considers all comments received on the EIS and directs the proponent to provide further information as considered necessary.
- The proponent prepares and submits a Supplementary Report addressing matters raised in comments on the EIS.
- The Supplementary Report is distributed to referral agencies and registered submitters who are requested to submit final comments and approval conditions to the Coordinator-General.
- The Coordinator-General prepares a report containing an assessment of the project, a decision of whether to proceed or not, conditions that should be attached to the project and subsequent development approvals. This report becomes the Concurrence agency report under IDAS and the Assessment Report under the EPBC Act.

3.3.4 Subsequent Approvals - IDAS

The Coordinator-General's Report allows the project to proceed but work cannot proceed until development approvals are obtained. Those approvals outlined in

Table 4 are still required.

For IDAS approvals, the Coordinator-General's Report is the concurrence agency report and subsequent approvals must abide by the recommendations and conditions in the Coordinator-General's Report.

Further public notification under IDAS is not required as the public exhibition of the EIS is considered to satisfy *Integrated Planning Act 1997* public notification requirements.

The flowchart for these approvals is shown in Figure 11.

3.3.5 Non-IDAS Approvals

Great Barrier Reef Marine Park Act 1975/Queensland Marine Park Act 1982

A permit is required for the installation of a structure in a State marine park (Section 22) including the intake and discharge pipelines and discharge of concentrate. For the State marine park (State waters between high and low tide mark), this permit is administered by Queensland Parks and Wildlife Service (a subsidiary of EPA) while for the Commonwealth Marine Park, Great Barrier Reef Marine Park Authority administers the approval requirements.

Nature Conservation Act 1992

The *Nature Conservation Act 1992* is intended to conserve biological diversity, ecologically sustainable use of wildlife, ecologically sustainable development and international criteria developed by the World Conservation Union (International Union for the Conservation of Nature and Natural Resources) for establishing and managing protected areas.

An approval is required to disturb, harm or destroy any species listed under the Act. This is not an *Integrated Planning Act 1997* approval.

Flora and fauna surveys undertaken to date have identified several bird species listed under the *Nature Conservation Act 1992* as being present on the site. It is not likely that the proposed development will harm or disturb these species and thus approval under the *Nature Conservation Act 1992* is not likely to be required. This will be confirmed in the EIS.

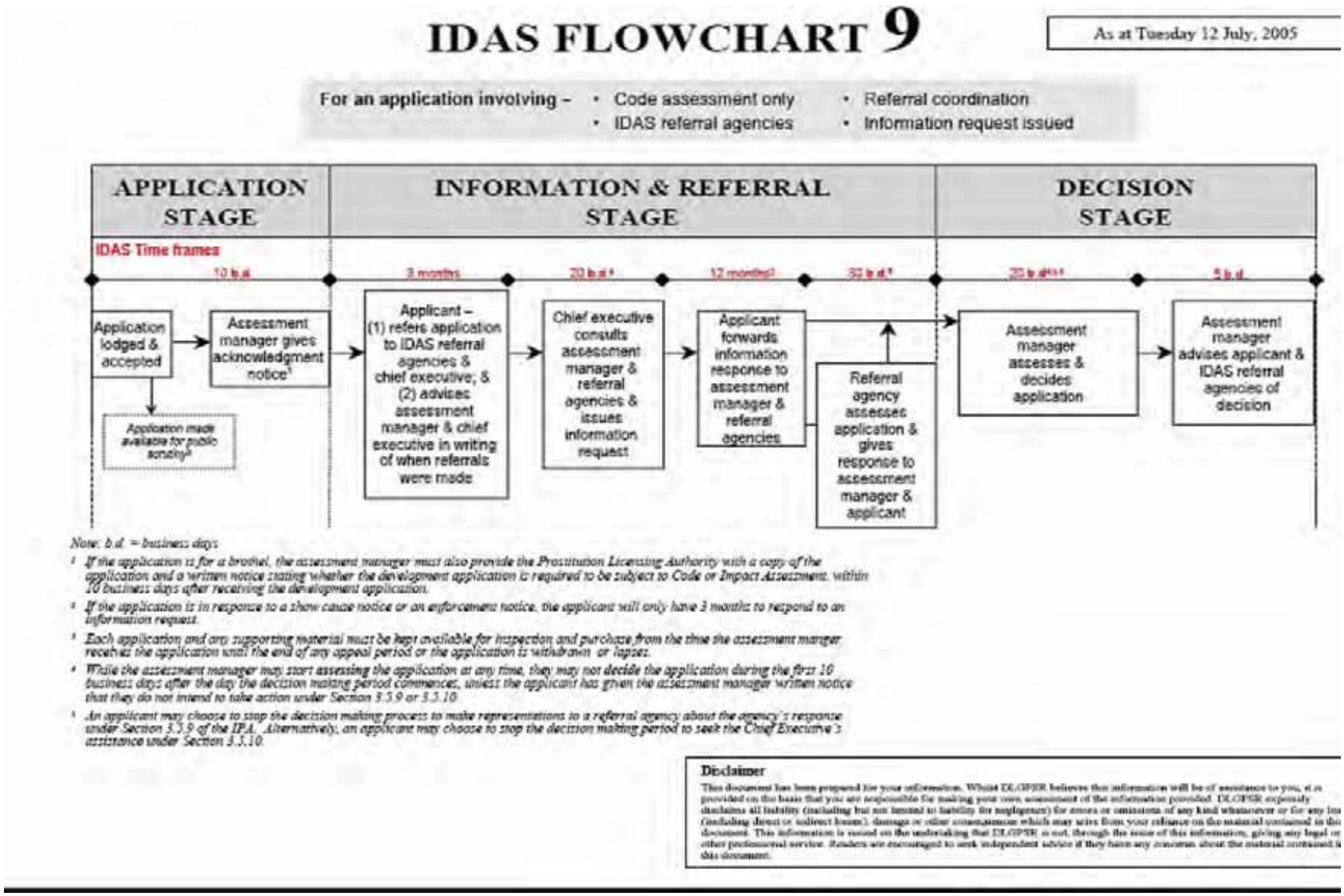

Figure 11: IDAS Approvals Flowchart

Aboriginal Cultural Heritage Act 2003

The *Aboriginal Cultural Heritage Act 2003* provides for the protection of cultural heritage and establishes duty of care guidelines to ensure *all reasonable and practical measures* are taken *to ensure that (an) activity does not harm [remove or possess] Aboriginal Cultural Heritage*. The Act establishes a framework for the assessment of potential impacts on cultural heritage and processes to be undertaken in preparing Cultural Heritage Management Plans (CHMP).

The *Aboriginal Cultural Heritage Act 2003* establishes a risk management assessment based on many factors including nature of activity and likelihood of causing harm, extent of consultation, searches of database/register, extent of any survey, nature/extent of past use of area, nature of cultural heritage likely to be harmed and compliance with duty of care guidelines.

The *Aboriginal Cultural Heritage Act 2003* does not require any formal approvals to be obtained. Instead, it makes it an offence to harm any item of Aboriginal cultural heritage significance unless such harm takes place in accordance with an agreed CHMP. The content of a CHMP must be agreed between the Proponent and the Traditional Owners of the affected lands. The Act and the associated Duty of Care guidelines set out processes by which Traditional Owners can be involved in a process of negotiating a CHMP.

Demonstrated compliance with the Duty of Care guidelines is a defence against prosecution for harming items of Aboriginal Cultural Heritage material.

The actual investigation and management requirements as set out by the duty of care guidelines are basically a function of level of both existing and proposed disturbance of the subject site. Hummock Hill Island is largely undisturbed in an archaeological context, and the site is therefore a Category 5 in the Duty of Care Guidelines. Satisfaction of the Duty of Care requires a CHMP to be negotiated and adhered to for all development related activities on the site.

The Guidelines also require a CHMP for any project where an EIS is required.

Note that the *Aboriginal Cultural Heritage Act 2003* is not an *Integrated Planning Act 1997* approval and the CHMP negotiation process can be undertaken independently of Development Approvals.

Native Title Act 1993

One of the primary purposes of the *Native Title Act 1993* is to provide ways for working with native title, especially in relation to economic or other development activities that will affect native title rights and interests.

In situations where the native title holders or claimants are known, parties proposing future acts on lands for which Native Title has not been extinguished need to undertake preparation of an Indigenous Land Use Agreement (ILUA). The Port Curtis Coral Coast native title claim group have a registered native title claim over a large area of Central Queensland, including Hummock Hill Island.

An ILUA is a voluntary agreement made under the *Native Title Act 1993* between people who hold, or claim to hold, native title in an area and other people who have, or wish to gain, an interest in that area.

Native title has been extinguished over Lot 3, being the development lease on which the Hummock Hill Island development is proposed to take place. Outside Lot 3, road and infrastructure reserves associated with the development may extinguish native title.

Resource Allocations

Removal of any material from below the high water mark (i.e. tidal waters) requires a quarry allocation under the *Coastal Protection and Management Act 1993*. This is not an IDAS approval and must be obtained before the IDAS approval is applied for.

The application must include details of the material proposed to be removed, as well as an assessment of the proposed activity against the Coastal Management Policy.

The EPA assesses the application and timeframes for assessment are typically 8 weeks, although this may be extended in a more complex or large-scale project.

Under the *Coastal Protection and Management Act 1993*, a royalty may be payable for resource extraction. An application can be made to waive any royalty where the material has no commercial benefit.

Resource allocation will also be required under the *Fisheries Act 1994* for any works in a Fish Habitat Area. Details will need to be provided on impacts on ecosystems in the Fish Habitat Area. Again, this resource allocation must be obtained before development approval under *Integrated Planning Act 1997* can be applied for.

Figure 12 Coastal Wetlands

4. Environmental Issues

4.1 Existing Environment

The existing environmental conditions at Hummock Hill Island and surrounding areas are described below. A more detailed description is provided in Appendix E.

- The site is currently unused and subject to Development Lease 19/52155. The only known previous use is grazing.
- Current over Hummock Hill Island is an Exploration Permits Mineral (Tenure type EPM number 7164) and an application for a Mineral Development Licence (Tenure type MDL number 310).
- The Department of Natural Resources and Mines identifies the mineral sands resource as being “small”, consisting of between 5,000 and 5,000,000 tonnes.
- Hummock Hill Island lies within or adjacent to a number of coastal and marine areas with designated conservation status including Great Barrier Reef World Heritage Area and Marine Park, Fish Habitat Area and Dugong Protection Area
- Hummock Hill Island has no permanent fresh water streams, natural lakes or permanent freshwater wetlands. A number of dams have been created, presumably for stock watering purposes, and continue to store water after rainfall.
- A tidal inlet associated with the Boyne Creek estuary effectively divides the island into an east and west portion. There are several other tidal inlets of varying sizes.
- The climate is subtropical with average annual rainfall at Gladstone is 918 mm and at Bustard Head is 1155 mm year. Rainfall is higher during summer months. Prevailing winds are generally from the south and east quarters.
- Shallow unconfined groundwater aquifers exist in the sands at the eastern and western ends of the island. Groundwater flows are towards the coast.
- The island is vegetated with remnant vegetation and regrowth. Vegetation includes Regional ecosystems classified as endangered, of concern and not of concern.
- The range and diversity of bird species on Hummock Hill Island is similar to that found on nearby island and mainland coastal locations. The southern end of Hummock Hill is a significant high tide roosting site for migratory waders.
- Ground dwelling fauna is scarcer and less diverse, reflecting the fact that Hummock Hill Island is cut off from the mainland at all but the lowest tides, when waters in Boyne Channel may be shallow enough for larger animals to traverse. Mammals include the Eastern Grey Kangaroo, several gliders, flying fox, bats and introduced rodents.

Figure 13: Open Woodland

- Two bird species have been observed on Hummock Hill Island that are listed under the Queensland Nature Conservation Act 1993, being the Eastern Curlew *Numenius madagascarensis*, listed as rare and the Beach Stone Curlew *Burhinus neglectus/Esacus neglectus*, listed as vulnerable.
- A number of migratory birds listed under EPBC Act have been identified on Hummock Hill Island, none of these are rare or threatened.
- An extensive intertidal zone extends along the southern, eastern and western coastlines of Hummock Hill Island to the mainland coast. Key habitats include intertidal mangrove and salt pan, intertidal and subtidal mudflats, sandy substrate and beaches, offshore (subtidal) rocky reef.
- Seagrasses have not been observed in close proximity to Hummock Hill Island. There are no coral reef communities in the immediate vicinity of Hummock Hill Island although coral reefs do occur to the southeast near Rodd's Peninsula.
- Hummock Hill Island is not known as a turtle-nesting site. Although Hummock Hill Island is located within Rodds Bay Dugong Protection Area there is minimal seagrass habitat in the immediate vicinity.
- Sea birds, including waders, herons, cormorants and oyster catchers are expected to be common users of the shallow marine areas.
- A range of hills runs north-south across the middle of the development lease, ending with Hummock Hill at the northern end at an elevation of 135 m AHD. Undulating plains based on granodiorite bedrock lie at the base of the main range, merging into dune sand areas.
- Soils include lithosols on the steeper slopes and crest of the main range, solodics on the undulating plains below the main range, red earth, on a small area east of the headland on the north shore and siliceous sands in the dune areas.

- Soils on the site are not classified as good quality agricultural land.
- Acid sulphate soils may occur in low-lying areas, particularly on the southern side of the island.
- A cattle dip associated with former cattle grazing activities is located near the headland.
- The landscape characteristics of Hummock Hill Island are a blend of natural scenery and rural (pastoral) scenery.
- Regional landscapes include industrial and port development at Gladstone.
- Shell middens and artefact scatters from former Aboriginal use have been found on Hummock Hill Island. European cultural heritage sites are associated with previous pastoral uses. A stone cairn of unknown origin exists on top of Hummock Hill.
- Hummock Hill Island is not affected by air or noise emissions from the Gladstone industrial areas.
- Cyclonic activity in the region occurs predominantly between January and March. Storm surge levels on the ocean side of Hummock Hill Island are estimated to be 3.3 to 3.6 m AHD (100 year average recurrence). The Gladstone area has one of the higher seismic activity levels in Australia.
- Hummock Hill Island is located in the Wide Bay-Burnett region, although it is immediately south of the Central Queensland Region. This is one of the fastest growing regions in Queensland, with population increases in Calliope and Miriam Vale Shire thought to be largely associated with industrial and related development in Gladstone.
- The 2004 population of Miriam Vale Shire is estimated at 5,113 persons and is predicted to grow to about 10,000 people in 2026.
- Economic activity in Miriam Vale is based on agricultural activities with the northern end of the Shire being increasingly influenced by industrial development in Gladstone/Calliope, particularly in terms of residential development.
- The closest urban centres to Hummock Hill Island are Miriam Vale and Bororen and the closest city to Hummock Hill Island is Gladstone, about 60 km by road from Hummock Hill Island.
- Businesses in the agriculture, forestry and farming industry make up 61.1% of total businesses by industry in the Central Queensland shires of Miriam Vale, Calliope, Burnett and Fitzroy, this is compared with 17.2% average for the state.
- The Bruce Highway provides the main north-south access route through the Gladstone Region. The Dawson Highway links Gladstone with the central and west regions.
- Access to Hummock Hill Island is from Turkey Beach Road, Foreshores Road, and Clarks Drive.
- The North Coast Rail Line links Gladstone with Brisbane and Cairns. Stations are at Miriam Vale and Gladstone.

- Gladstone has an airport and is also one of Queensland's major sea ports.
- Hummock Hill Island is not currently serviced by power, telecommunications, water or wastewater services. These services are all available in close proximity to Hummock Hill Island.
- A major regional landfill is proposed for Calliope Shire.

4.2 Management of Environmental Impacts

4.2.1 Land Use and Tenure

Potential Impact	Response
Development of Lot 3 will preclude mining of the small mineral sands resource.	Hold discussions with exploration permit holder Review economic feasibility of extracting the resource.

Conservation Estate

Potential Impact	Response
Development will degrade world heritage values of the GBRWHA	• Development can be undertaken without impacting on world heritage values. Refer Appendix F for an assessment of potential impacts on world heritage area values. • Consultation will be undertaken with Department of the Environment and Heritage to discuss particular concerns and identify appropriate management measures
Development will degrade marine park/coastal marine park	• Zoning around Hummock Hill Island is General Use Zone with no particular sensitivities identified. • The proposal requires only minor structures in the marine park/coastal marine park with negligible habitat loss expected. • Consultation will be undertaken with Great Barrier Reef Marine Park Authority and Queensland Parks and Wildlife Service to discuss particular concerns and identify appropriate management measures
Development will increase boat traffic in marine park/coastal marine park	• Boat ramps will allow increased public access and enjoyment of the marine park in line with the goals and management philosophy for the park. • General Use Zone indicates that the area around Hummock Hill Island has reasonable tolerance to boating and related activities.

Potential Impact	Response
	• Boating levels are not likely to exceed sustainable use levels.
Development may reduce the fish habitat value of Colosseum FHA	• Disturbance to fish habitat within the FHA will be negligible. • The proposed boat ramp at Colosseum Inlet will avoid clearing of any mangroves and will be located in sandy substrate. The ramp structure itself may provide hard substrate for some marine flora and fauna • The proposed bridge and boat ramp at Boyne Channel is within an exclusion zone in the FHA. In any case, these structures will result in the clearing of a small area of mangroves and traversing of a small area of unvegetated salt flat. Once in place, the structures may provide hard substrate for marine flora and fauna. • Indirect impacts on water quality in the FHA will be managed through integrated stormwater and wastewater management such that the quality and quantity of runoff to coastal areas remains at pre-development conditions.
The development may reduce the habitat value of the Rodds Bay Dugong Protection Area	• The proposed development will not impact directly or indirectly on seagrasses on which dugong feed. • While the proposed development may increase boat traffic, there are no seagrass beds in the vicinity of Hummock Hill Island that are accessible to boats. Boat speeds in Boyne Channel will be naturally controlled due to the shallow nature of the channel and risk of running aground. Signs can be placed at boat ramps warning boaters of the need to watch for dugongs (and other marine species) and maintain safe speeds in shallow, enclosed waters. • The fishing controls imposed in a Dugong Protection Area will remain in force and signs can be placed at boat ramps informing boaters of these restrictions.

4.2.3 Water Resources

Potential Impact	Response
Development will alter quality and quantity of stormwater discharges to ephemeral freshwater ecosystems and coastal ecosystems	• Indirect impacts on water quality will be managed through integrated stormwater and wastewater management such that the quality and quantity of runoff to coastal areas remains at pre-development conditions. • Water sensitive urban design measures will be incorporated into stormwater management to maintain acceptable stormwater quality from developed areas. • Only a small proportion of each catchment is to be developed. • Changes to existing catchment sizes and drainage patterns will be minimal
Harvesting of surface water resources will alter freshwater runoff to ephemeral freshwater ecosystems and coastal ecosystems	• Harvesting of surface waters will be restricted to rainwater tanks. This will serve to balance effects of increased runoff from reduced infiltration due to development.
Harvesting of potable groundwater resources will result in increased salinisation of the shallow aquifer	• Groundwater resources are not to be utilised for water supply
Vegetation clearing will affect groundwater recharge and discharge zones.	• Vegetation will be retained in recharge and discharge zones as much as possible. • Vegetation clearing will be limited in discharge zones.
Discharge of treated wastewater and greywater will impact on water quality in adjacent marine zones.	• Treated wastewater and greywater will be disposed of via irrigation under all normal circumstances • Irrigation rates will be adjusted according to the soil type • Irrigation will not take place within 100m of high water mark or any ephemeral coastal or freshwater wetlands. • Discharges to the marine environment will only occur in high rainfall events. Only tertiary treated wastewater will be discharged.
Erosion from disturbed areas will impact on water quality.	• Erosion and sediment control measures will be incorporated into all construction activities.

Potential Impact	Response
	• Disturbed surfaces will be reinstated or otherwise stabilised as soon as possible after completion of earthworks. • Developed areas will incorporate stormwater management devices based on principles of water sensitive urban design to maximise removal of sediment from stormwater.
Accidential spills of fuels and toxic chemicals may impact on water quality in adjacent sensitive wetland ecosystems.	• Use of hazardous chemicals at the site will be minimal • Use of fuels at the site will be limited to refuelling of equipment during construction activities and fuel supplies for generators during operation. • Hazardous materials management plans will be developed for both construction and operation of the development. Storage, handling and transport will be in accordance with Australian Standards and accepted best practice.

4.2.4 Terrestrial Ecosystems and Species

Potential Impact	Response
The extent of endangered and of concern remnant vegetation will be reduced	• The proposed master plan has been developed to avoid impacts on endangered and of concern Regional Ecosystems. • Clearing of endangered and of concern Regional Ecosystems will be avoided except for minor access requirements. • Undeveloped areas within the development lease will be made available for protection as areas of conservation significance. Discussions will be undertaken with Miriam Vale Shire Council and Queensland Parks and Wildlife Service as to the most appropriate means to achieve this.
Endangered flora and fauna species will be impacted on.	• The only endangered species identified on Hummock Hill Island to date are shore birds • Habitat for endangered species is not likely to be directly or indirectly affected by the proposed development.

Potential Impact	Response
Protected migratory species will be impacted on.	• Habitat for protected migratory species will not be significantly diminished by the proposed development. • Protection of endangered and of concern regional ecosystems and coastal areas may enhance long term protection of migratory species.

4.2.5 Coastal and Aquatic Ecosystems

Potential Impact	Response
Direct loss of habitat due to development	• Direct disturbance of coastal habitat limited to boat ramps at Colosseum Inlet and Boyne Channel, and bridge crossing over Boyne Channel. Note that these structures will provide some hard substrate for marine flora and fauna. • No other development will take place within 100m of the high tide mark with the exception of a rocky headland (40m).
Indirect impacts on ecosystem health due to degradation of water quality or changes in freshwater flows.	• Refer Section 4.2.3 above.
Loss of habitat for sensitive species such as migratory waders, dugong and turtle	• No direct or indirect impacts on seagrass habitat or migratory wader habitat • Boat strikes not likely to increase significantly as boat speeds are naturally restricted in enclosed and shallow waters. • Suitability of beaches for turtle nesting remains unchanged. Turtle nesting has been demonstrated to be able to occur in proximity to urban areas with appropriate access controls.

4.2.6 Geology and Soils

Potential Impact	Response
Vegetation clearing and earthworks will increase erosion risk.	• Erosion and sediment control measures will be incorporated into all construction activities. • Disturbed surfaces will be reinstated or otherwise stabilised as soon as possible after completion of earthworks. • Developed areas will incorporate stormwater management devices based on principles of water sensitive urban design to reduce flow velocities and volumes.
Spills and leaks of hazardous materials and fuels will cause soil contamination	• Use of hazardous chemicals at the site will be minimal • Use of fuels at the site will be limited to refuelling of equipment during construction activities and fuel supplies for generators during operation. • Hazardous materials management plans will be developed for both construction and operation of the development. Storage, handling and transport will be in accordance with Australian Standards and accepted best practice.
Contamination arising from the cattle dip will present a health hazard.	• The cattle dip area will be remediated in accordance with Queensland EPA requirements.
Irrigation will increase salinity in soils or cause waterlogging	• Irrigation rates will be matched to soil types • Monitoring of areas regularly receiving large amounts of irrigation water will be carried out to check that irrigation rates are within the absorptive capacity of the system.
Agricultural productivity of the region and State will be diminished	• Agricultural suitability of soils on Hummock Hill Island is limited and the soils of the island are not classified as Good Quality Agricultural Land.

4.2.7

4.2.8 Visual Environment

Potential Impact	Response
Aesthetic quality of the Great Barrier Reef World Heritage Area will be diminished	• Building height restrictions and building design codes will be used to maximise integration with the existing landscape characteristics. • Clearing of beach littoral vegetation will not occur, and this vegetation will remain as screen to development behind the beaches • Development on the headland will be more prominent but will consist of stand along houses rather than a large complex such as a hotel • The waters offshore of Hummock Hill Island are not subject to particularly high recreation or tourism usage.
The quality of views over the coastline and island from the mainland will be degraded.	• Hummock Hill Island is not visible from Bruce Highway or most accessible locations along the mainland coast. • Building height restrictions and building design codes will be used to maximise integration with the existing landscape characteristics. • Retention of vegetation in the coastal strip will assist in screening buildings from view.

4.2.9 Cultural Heritage

Potential Impact	Response
Items and sites of Aboriginal Cultural Heritage Significance will be lost or degraded	• To date, artefacts and middens identified on Hummock Hill Island are not of particularly high conservation significance, with their main value as an indication of past usage of the island by Traditional Owners • Further archaeological survey can be undertaken in conjunction with Traditional Owners if desired. • A Cultural Heritage Management Plan will be prepared in consultation with the Port Curtis Coral Coast Claimants setting out the means by which Aboriginal cultural heritage items will be protected or otherwise managed. • Wherever possible, and subject to the wishes of the Traditional Owners, cultural heritage items will be left in situ.

Potential Impact	Response
Items and sites of European Cultural Heritage Significance will be lost or degraded	• Further investigation will be conducted into the potential significance of items located on Hummock Hill Island. • A Cultural Heritage Management Plan will be developed to minimise loss of cultural heritage material, and allow collection of relevant information from any sites that will be disturbed by the development.

4.2.10 Noise and Air Quality

Potential Impact	Response
The Wastewater Treatment Plant and Waste Transfer Station will give rise to offensive odours	• The selected location for these services is away from proposed residential areas and is generally downwind of areas proposed for activity. • These facilities will be designed and operated so as to minimise generation of odour.
Facilities and services such as power generation and wastewater treatment will generate noise levels that disturb future residents on Hummock Hill Island.	• These facilities have been located away from areas that may be particularly noise sensitive. • Design of these features will incorporate noise reductions measures as appropriate to the environment into which they are to be placed. • Noise emissions from these features will comply with requirements established in the State Environmental Protection (Noise) Policy 1997
Power generation may release contaminants to the atmosphere.	• Power generator(s) will have emissions control technology installed • Design and operation of power generator(s) will be such that emissions comply with the *State Environmental Protection (Air) Policy 1997* and the National Environmental Protection Measure for air quality.
Noise from the development may disturb native animals.	• Animals present on Hummock Hill Island and in surrounding waters are likely to be fairly tolerant to noise relating to human settlement. Many of the species observed on Hummock Hill Island are known to occur in urban areas.

Potential Impact	Response
Air pollutants associated with the Gladstone Industrial Area may result in poor ambient air quality at Hummock Hill Island.	• To date, ambient air quality in communities close to the Gladstone Industrial Area have remained within acceptable health limits. • Significant dispersion of air pollutants would occur before such pollutants reached Hummock Hill Island further reducing the ambient concentrations. • Prevailing winds will tend to blow air pollutants from the Gladstone Industrial Area away from Hummock Hill Island rather than towards it.

4.2.11 Hazard and Risk

Potential Impact	Response
Storm surge may lead to inundation of developed areas.	• The development footprint is set back from the coastline and adjacent low lying lands to ensure that development does not occur in the storm surge zone.
Intense rainfall associated with cyclonic conditions may cause flooding.	• Catchment areas on Hummock Hill Island are small and dangerous flooding or flash flooding is not likely to occur • The requirements of the *State Planning Policy 1/03 Mitigating the Adverse Impacts of Flood, Bushfire and Landslide* will be addressed. • Stormwater systems will be designed to capture and disperse flows from major rainfall events
Strong winds from cyclonic events may cause damage to buildings and injury to inhabitants.	• Building design will comply with relevant building codes for Central Queensland, taking maximum wind speeds into consideration.
Earthquakes may case building damage and injury to inhabitants.	• Buildings will be designed in accordance with relevant standards for the likely occurrence of earthquakes in the Gladstone area.
Bushfire may cause injury to inhabitants and property damage or loss. Bushfire may also impact on ecosystems.	• The requirements of the *State Planning Policy 1/03 Mitigating the Adverse Impacts of Flood, Bushfire and Landslide* will be addressed. • A bushfire management plan will be developed addressing both the human safety and ecological aspects of bushfires.

Potential Impact	Response
	• Fire fighting services will be provided in consultation with the Department of Emergency Services.
Emergency medical services are not available in close proximity to Hummock Hill Island.	• The airstrip will allow emergency evacuation by aeroplane or helicopter if required. This will also service nearby communities such as Turkey Beach and Foreshores. • Hummock Hill Island is 60 km by road from major hospitals at Gladstone.

4.2.12 Social and Economic

Potential Impact	Response
Hummock Hill Island is remote from commercial and activity centres	• Hummock Hill Island is 60km by road to Gladstone and slightly closer to Tannum Sands • Both Gladstone and Tannum Sands have extensive commercial and activity centres • The proposed development population of 4,000 people at Hummock Hill Island is adequate to support smaller commercial, retail and entertainment businesses • The proposed development will offer significant outdoor recreation activities not typically available in an urban environment.
The proposed development is remote from schools.	• Families will represent a relatively small proportion of the total population of Hummock Hill Island. • The proponent will dedicate a primary school site at Hummock Hill Island or other suitable location in consultation with Department of Education. In future, a primary school may support development at Hummock Hill Island as well as the existing/expanding communities at Turkey Beach and Foreshores. • There are existing primary schools at Bororen and Miriam Vale • There is a year 8 to 10 high school at Miriam Vale and complete high schools in Gladstone and Tannum Sands. These will be about 45 minutes drive from Hummock Hill Island once the access road is completed. The development population may be large enough to warrant a school bus service, especially if this can also service Turkey Beach and other smaller settlements in the area.

Potential Impact	Response
The proposed development will provide outdoor recreation and holiday facilities for the regional community.	• Access to swimming beaches and nature based recreation in the region will be considerable enhanced by the development of Hummock Hill Island. Currently, the only beach in close proximity to Gladstone is Tannum Sands. • The next nearest location with beaches and holiday accommodation is at Yeppoon, some 90 minutes drive north of Gladstone. • Day visitor facilities and parking will be provided in open space areas • Camping grounds and 3-4 star resort hotels will offer affordable and flexible options for overnight stays for residents in Gladstone and central Queensland communities, as well as travellers from outside the region. • The golf course and associated sporting facilities will provide venues for organised sporting activities.
Employment will be generated at Hummock Hill Island	• Employment in retail, commercial, hospitality, maintenance and recreation fields will be generated by the proposed development. • A range of medium and lower cost housing options have been included in the Master Plan so that those employed on Hummock Hill Island may have access to affordable housing close to their place of work.
Construction and operation workforce will put pressure on housing stock and community services	• The maximum number of construction employees is expected to be in the order of 60-80 persons in Stage 1. Adequate accommodation should be available in local communities. In subsequent stages, opportunities will also exist for construction workers to rent accommodation on Hummock Hill Island. • A range of housing types has been allowed for in the Master Plan including lower cost housing options for workers. • The Master Plan includes provision for community infrastructure facilities such as a primary school, emergency services and private medical facilities. These will be brought on line as population on the Island and neighbouring mainland areas requires.
Regional research and education facilities will be enhanced	• The proponent is committed to providing an educational facility at Hummock Hill Island as a focal point of the proposed development.

Potential Impact	Response
	• The activities of this facility have not been finalised but will be relevant to the Central Queensland region, focussing perhaps on mining or coastal development issues.
Economic activity in Miriam Vale and Central Queensland generally will be enhanced.	• The proposed development is centred on tourism and recreational activities which will boost diversification of the local and regional economies. • Residents of the Central Queensland region will have increased opportunity to remain within Central Queensland for their holiday and recreational activities, thus reducing leakage from the regional economy.

4.2.13 Infrastructure and Traffic

Potential Impact	Response
Traffic generation will exceed the capacity of local and regional roads	• A traffic impact assessment study will be undertaken • The proponent will fund necessary upgrades to the road network to ensure that it has adequate capacity for the traffic generated from the proposed development
Demand for water will exceed availability of water in the region	• Rainwater tanks will be mandatory on all buildings in the proposed development and are expected to make up about 70% of residential water demand • Discussions with Gladstone Area Water Board indicate that the additional demand from Awoonga Dam required to top up rainwater tanks is insignificant in the context of industrial users • Calliope Shire Council has indicated that top up water can be supplied to the development from Tannum Sands Reservoir without impact on its ability to supply existing and future customers. • The proponent will fund all necessary infrastructure to provide water supply to Hummock Hill Island. Opportunities may also exist to connect in other communities in northern Miriam Vale. • Water conservation measures will be mandatory for all internal and external uses of potable water.
Water supply for fire fighting will be inadequate	• Fire fighting requirements will be designed into the water supply system in accordance with Australian Standards • Consultation will be undertaken with Department of Emergency Services regarding the provision of fire fighting facilities and equipment.

Potential Impact	Response
Quality of water supply will not meet health requirements	• Water for drinking, cooking and other “potable” uses will be supplied through a reticulated network where water quality can be monitored and controlled. • Where individuals use rainwater tanks for potable water supplies, filters and disinfection units can be installed to ensure adequate water quality.
Demand for power may exceed availability	• Ergon has confirmed that adequate power supplies are available in the area. • Wind and solar power solutions are included in the overall power supply package to reduce dependence on fossil fuel power sources.
Waste generation from the site will put pressure on existing waste disposal facilities.	• A new regional landfill is proposed to be constructed at a site in Calliope Shire. This landfill will have adequate capacity for future growth in Miriam Vale Shire. • A waste materials recovery facility will be installed on Hummock Hill Island requiring the segregation of waste in recyclable and non-recyclable components. Hazardous waste storage will also be provided at this facility. • There will be no solid or hazardous waste disposal on Hummock Hill Island.

Appendix A

Proposed Land Use Areas

Table 5: Proposed Land Use Areas

Landuse	Area (Hectares)	Lot Numbers Holiday/ Residential	Percentage of Total Area
Development Uses			
Marine Centre & Retail	2.50		0.21%
Boyne Channel Home Offices	2.30		0.20%
Hummock Hill Town Centre	3.40		0.29%
Conference Centre & Motel	4.70		0.40%
Airport Services	1.90		0.16%
Headland Resort Hotel	6.60		0.56%
Beach Front Tourist Hotel	6.40		0.55%
Tourist Park	10.00		0.85%
School Recreational Camp Ground	13.90		1.19%
Education Centre & Community Purpose	11.50		0.98%
Boyne Channel Apartments	5.70	160	0.49%
Golf Course Resort Apartments	4.40	160	0.38%
Headland Resort Apartments	2.40	85	0.20%
Beach Front Apartments	2.30	80	0.20%
Resort Town Apartments	2.30	90	0.20%
Village Town Houses	4.80	100	0.41%
Bushland Residential	23.50	195	2.01%
Lagoon Villas	16.60	136	1.42%
Riparian Eco Homesites	18.80	152	1.60%
Beachfront Holiday Homes	22.20	180	1.90%
Headland Holiday Homes	2.80	20	0.24%
Seaside Cottages	10.00	150	0.85%
Ridgetop Housing	36.50	277	3.12%
Hill Side Terraces	16.20	102	1.38%
Golf Course resort Homesites	23.40	155	2.00%
Sub Total	255.10	2,042	21.78%
Environmental			
Environmental Protection	580.		50.03%
Golf Course	95.2		8.30%
Town Park	0.4		0.03%
Green Space	194.		16.60%
Eco Parks	7.2		0.61%
Sub Total	876.8		75.57%
Services			
Airfield	28.80		2.46%
Waste Management	2.30		0.20%
Sub Total	31.10		2.65%
Total	**1,163.0**	**2,042**	

Appendix B

Development Program

Hummock Hill Island Development

Development Program

	No of Units	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Development Approvals		====== ====																			
Infrastructure																					
Access Road to the Island			===== ====																		
Bridge over Boyne Creek			===== ====	=====																	
Water Supply to the Island			====	=====																	
Waste Water Treatment Plant			====	=====																	
Power Supply				=====																	
Solid Waste Transfer Station				=====																	
Trans Island Boulevard and Services				====	=====																
Social Infrastructure																					
Colluseum Boat Ramp and Jetty					=====																
Beachside Picnic Parks					=====		=====		====												
Retail And Commercial Centre						=====			====				====				====				
Education Precinct																					
> Infants and primary School									====				====								
>Centre for Higher learning						=====															
Community Services																					
> Fire Station							=====														
>Police Station							=====														
>Ambulance Station							=====														
>Medical Centre							=====														
Boyne Channel Marine Centre and Boat Ramp								===== ====													
Boyne Channel Home Offices									===== ====												
Airport							====														
Tourist Park							===== ====														
School Recreational Camping Ground							===== ====														
Golf Course									===== ====	===== ====											
Resort and Residential Development																					
Headland Resort Hotel	150 rooms			====	===== ====																
Headland Resort Apartments	85				===== ====																
Headland Holiday Homes	20			=====																	
Beach Front Holiday Homes	180				===== ====		===== ====		===== ====												
Beach front Apartments	80					===== ====															
Seaside Cottages	150							===== ====		===== ====											
Ridgetop Houses	277			===== ====		===== ====		===== ====		===== ====											
Hill Side Terraces	102											===== ====		===== ====							
Lagoon Villas	136				===== ====	===== ====															
Riparian Eco Houses	152						===== ====		===== ====		===== ====										
Bushland Residential	195														===== ====		===== ====		===== ====		
Resort Town Apartments	90					===== ====		===== ====													
Resort Village Townhouses	100									===== ====		===== ====									
Golf Course Resort Homesites	155													===== ====		===== ====		===== ====			===== ====
Golf Course Resort Apartments	160									===== ====		===== ====									
Boyne Channel Apartments	160													===== ====		===== ====					
Beachfront Tourist Hotel	150														===== ====						
Conference Centre and Motel	50																		===== ====		

Population	**Units**																				
Headland Resort Hotel	150					180															
Headland Resort Apartments	85					45		45		45											
Headland Holiday Homes	20			40																	
Beach Front Holiday Homes	180					120		120		120											
Beach front Apartments	80				27		27		27		27		27		27						
Seaside Cottages	150								120		120										
Ridgetop Houses	277				121		121		121		121				121		121		121		121
Hill Side Terraces	102												71		71						
Lagoon Villas	136					109	109														
Riparian Eco Houses	152							89		89		89									
Bushland Residential	195															114		114		114	
Resort Town Apartments	90						72		72												
Resort Village Townhouses	100										80		80								
Golf Course Resort Homesites	155														68		68		68		68
Golf Course Resort Apartments	160										128		128								
Boyne Channel Apartments	160														128		128				
Beachfront Tourist Hotel	150															180					
Conference Centre and Motel	50																			60	
Tourist Park	100							160													
Tourist					87	340 154	178	250 154	219	150	315	44	230		221	237	159	57	95	117	95
					87	87 427 581	759	759 1,008 1,162	1,382	1,382 1,531 1,531	1,847	1,847 1,891 1,891	2,121	2,121 2,121 2,121	2,342	2,342 2,579 2,579	2,737	2,737 2,794 2,794	2,889	2,889 3,006 3,100	
Permanent				40	61	114	151	104	121	104	161	44	76		194	57	159	57	95	57	95
				40	101	101 215 215	366	366 470 470	591	591 695 695	856	856 900 900	976	976 976 976	1,170	1,170 1,227 1,227	1,385	1,385 1,442 1,442	1,537	1,537 1,594 1,688	
Total				40	148	454	329	414	340	254	476	89	306		415	294	317	114	189	174	189
				40	188	188 642 642	971	971 1,385 1,385	1,724	1,724 1,978 1,978	2,454	2,454 2,543 2,543	2,849	2,849 2,849 2,849	3,264	3,264 3,558 3,558	3,875	3,875 3,989 3,989	4,178	4,178 4,351 4,540	

Appendix C

State Government Policy Issues

C1 State Coastal Management Plan

The State Coastal Management Plan (SCMP) describes how Queensland's coastal zone is to be managed. The plan seeks to provide ways to protect and manage Queensland's coastal resources to benefit all Queenslanders.

A Regional Coastal Management Plan has not been developed for the Wide Bay-Burnett Region.

The SCMP balances the natural, cultural, economic and social significance of Queensland's coast in a sustainable manner. It does this by recognising both opportunities and threats to sustainable use of the coastal zone.

The SCMP recognises the social and economic value of the coastal zone for tourism and recreation related development and seeks to maintain and enhance access to the coast. In relation to coastal settlements, the SCMP identifies the need for these to be sustainable and well located. In particular, the SCMP seeks to control development of the coastal zone in a way that avoids direct and indirect disturbance of the coastal resources which, in themselves, underlie the success of tourism and recreational development of the coast. The proposed development at Hummock Hill Island is based on development principles that recognise these inter-relationships.

Section 2.1.2 of the SCMP is particularly relevant to the proposed development and states that, "to the extent practicable" coastal resources should be preserved in a natural or non-urban state. The words "to the extent practicable" were incorporated to reflect decisions made regarding coastal development that predated the plan. The tourism and residential development at Hummock Hill Island has been recognised for nearly two decades, and predates both the *Coastal Protection and Management Act 1993* and the SCMP. Successive development leases have been issued over the site since 1991. In mid 1990's, Miriam Vale Shire Council issued development approval for around 5,000 lots, a marina, 2 golf courses and hotel/convention centre, There is a clear precedent for this type of development on the island, and in fact, the currently proposed development represents a significant reduction in scale from previous proposals which have also included a rocket launching facility and industrial park centred on space industries.

Development of Hummock Hill Island will not result in pressure for additional development along adjacent coastal areas (which have not previously been identified for development) and is readily containable. Immediately north of the island is Wild Cattle Island, most of which is national park. The adjacent mainland coastal areas south and west of Hummock Hill Island are not suitable for coastal development, being mangroves, salt marsh and mudflats, being subject to inundation and offering little or no residential amenity. The proposed development at Hummock Hill Island is not inconsistent with the policy which aims to avoid proliferation of urban development at the expense of coastal and marine ecosystems.

The development principles identified for the project include protection of coastal resources including coastal ecosystems and drainage patterns. The only works proposed to take place below HAT or in are the bridge crossing and one or two boat ramps. These are to be located in sheltered waters. No development is to take place in the designated erosion prone areas along the exposed northern coastline.

A coastal buffer strip is to be maintained around the island with controlled access to the beach to prevent destabilisation of remnant coastal dunes. Endangered regional ecosystems are to be protected, whether these are "coastal" (eg dune systems with littoral vine forest) or otherwise (eg poplar box).

Indirect impacts to the coastal zone and coastal/marine ecosystems are to be managed through careful planning and design. In particular, management of water

supply, stormwater and wastewater will be such that there are no significant changes to quality or quantity of water released into coastal ecosystems or shallow groundwater aquifers. Water sensitive urban design is to be incorporated into the development.

Section 2.8.1 of the SCMP stipulates that Urban and other development should not take place in areas of State Significance. The only area of state significance directly affected by the project is the Great Barrier Reef WHA. The EIS will need to assess the potential for the development to impact on the values for which the WHA was proscribed. A preliminary assessment has been undertaken and is included in Appendix B.

Similarly, the proposed lease is adjacent to the Great Barrier Reef Marine Park and while direct impacts on the Marine Park are limited to construction of a bridge and two boat ramps, the EIS will also need to demonstrate that the proposed development will not have any indirect impacts on the ecosystems protected by that park.

Measures already incorporated into the project to minimise impacts on coastal and aquatic ecosystems include:

- Maintenance of a coastal buffer zone of at least 100m along sandy coastlines and 40m on rocky coastlines. Where remnant dune systems with vine forest exist along the coastline, these will be retained.
- No clearing of mangroves except for at the bridge/boat ramp where no more than 10 mangroves are expected to require trimming or clearing.
- Recycling and ultimate land disposal of treated wastewater. Land disposal will be in accordance with Queensland EPA guidelines and will be such that nutrient rich runoff does not occur.

It is acknowledged that the ability of the proposed development to comply with the State Coastal Management Plan will need to be comprehensively addressed in the EIS. EIS investigations may identify further measures to ensure that aquatic and coastal ecosystems are not impacted on.

C2 Regional Growth Management Frameworks

Hummock Hill Island lies on the northern boundary of the Wide Bay regional planning area, immediately adjacent to the Central Queensland regional planning area. Its proximity to Gladstone, as the major urban and industrial centre of Central Queensland means that development patterns and pressures in the northern part of Miriam Vale Shire tends to be influenced more by Gladstone and the Central Queensland region than by the Wide Bay region. In particular, Hummock Hill Island and other localities in the far north of Miriam Vale are closely aligned to the Gladstone and Calliope subregion of Central Queensland.

On this basis, the proposed development will be examined against both the Wide Bay 2020 RGMF and the Central Queensland a New Millennium RGMF.

The Wide Bay 2020 RGMF sets out a vision for the region. This vision centres on enhancing lifestyles in the Wide Bay region through the attractions of the natural environment and a robust regional economy.

The three key components to the vision of the region in 2020 are:

1 Natural resource management, including development according to the principles of Ecologically Sustainable Development, safeguarding of ecological values and biodiversity and wise use of natural resources to underpin the region's prosperity.

2. People and settlement reflecting best practice in urban development, harmony with natural systems and lifestyle choices. Efficient access to services across the community, including rural communities is highlighted as is location and design of new residential development to minimise environmental impacts and maximise opportunities to take advantage of potential energy savings relating to the region's climate.

3. The region's economy is linked to a healthy environment, and retains agriculture as a key contributor. Transport and communication innovations are in place to minimise disadvantages of the region's remoteness from major centres and economic development is based on the region's competitive advantages. Higher education and targeted training opportunities underpin economic growth and stability.

The proposed residential development at Hummock Hill Island will contribute to this vision:

- The development is intended to be in harmony with the natural environment and showcase innovative urban and residential design in relation to energy and water consumption as well as protection of ecosystems.
- There will be a diverse community with a range of lifestyle options available. Employment opportunities will underpin the proposed development, particularly in relation to tourism and recreation. The proposed learning centre will enhance educational opportunities available within the Wide Bay region.
- The proposed development takes maximum advantage of its coastal location and environmental setting to encourage people to live on and visit Hummock Hill Island. The proposed level of development can be achieved without detracting from the natural resources or ecological values that will, in themselves, attract visitors to the region. The coastal location and associated lifestyle benefits is an important attraction for residents and visitors and also allows building designs to take advantage of the cooler coastal climate.
- Hummock Hill Island is not considered to be viable for agricultural uses, and its development for residential and tourism uses does not detract from the central role of agriculture in the region's economy.
- In spite of its remote location, Hummock Hill Island can be developed without undue demands on existing infrastructure and community services. The proposed development will have a large enough population to be self sufficient with regard to basic services. It is also close enough by road to Gladstone to allow residents to travel to Gladstone for specialist services.

- There are a number of other residential developments occurring or proposed in northern Miriam Vale Shire and southern Calliope Shire. These include residential subdivisions at Turkey Beach and "Foreshores" estate. Services and recreational opportunities provided at Hummock Hill Island may contribute to the lifestyles in these developments.
- Infrastructure will be installed by the proponent in accordance with the Development Lease conditions. Ongoing maintenance will be funded through rates and development charges from residents. Renewable energy and water recycling will be maximised in the development to reduce the dependence on external services such as water and power. The Proponent will consider dedicating a primary school site on Hummock Hill Island or the mainland to services the growing population in the north of Miriam Vale Shire and south of Calliope Shire.

Analysis of Wide Bay 2020 will be undertaken in the Development Approval documentation. Where necessary, the master plan for Hummock Hill Island will be amended to ensure that the proposed development aligns with, and contributes to the strategic directions set out in Wide Bay 2020.

The vision statement for the Central Queensland A New Millennium RGMF centres on the industrial core of the region and the opportunities presented by this:

> *Central Queensland aspires to be the most diverse and prosperous region in Australia.*
>
> *This will be achieved by economic growth that is ecologically sustainable and where people and industry work in harmony with the environment for the benefit of both present and future generations whilst respecting the diversity of our past.*

Central Queensland A New Millennium has six key policy areas with guiding principles as shown in Table 6.

Table 6 Central Queensland – A New Millennium Guiding Principles

Policy Area	Guiding Principle	Response
Resource use, conservation and management	The allocation, use and management of the natural resources of Central Queensland shall be in accordance with the principles of ecologically sustainable development and shall be undertaken through the processes of integrated catchment management.	Water supply and management will maximise sustainable harvesting and reuse and minimise dependence on mainland surface water resources. Impacts on ecological resources will be minimised through avoidance of direct disturbance of all significant natural resources, and management of indirect impacts.
Economic development	Viable, environmentally sustainable economic growth and development takes place	The proposed development provides a tourism, recreational and residential focal point for the region that currently

Policy Area	Guiding Principle	Response
	through the recognition, protection and promotion of the region's competitive advantage, support of existing industries, diversification and the identification and encouragement of new economic opportunities.	only exists at Yeppoon in the far north of the region. The development will support and balance industrial development at Gladstone and mining development in inland areas by providing temporary and permanent accommodation. Attraction of visitors and residents from outside the region will be enhanced by the tourism and recreational opportunities and those already living in the region will also benefit as these opportunities are currently very limited in the Gladstone/Central Queensland area.
Infrastructure	The region's infrastructure shall be developed to anticipate the long term needs of communities and industries, regional prosperity and wellbeing, community vitality and ecological sustainability	The proposed development will not undermine any of the major infrastructure items that support industrial development in Gladstone. The proposed development will be fully self supporting with respect to infrastructure provision and maintenance.
Social and cultural development	Social and cultural fabric and vitality of the community that is underpinned by sound, ethically based planning, institutional support and investment that recognises the past, embraces the present and prepares for the future.	The proposed Hummock Hill Island development is centred on creating a viable and diverse community that includes a mix of local and non-local tourist attractions, holiday home and residential opportunities and recreational activities. The entire Hummock Hill Island development will be master planned to ensure consistent standards, compatibility and appropriate levels and types of development.
Education, training and research	The promotion of a climate of culture and learning in which Central Queensland strives for equity access to emerging technologies, knowledge, information and associated infrastructure which underpin the region's capacity for effective decision making, innovation and competitiveness.	An educational facility is the key focus of the proposed town centre. Discussions are underway with several organisations to position the educational facility to support growth and development goals for Central Queensland.

Policy Area	Guiding Principle	Response
Planning and governance	Planning and governance systems in the region recognise the uniqueness and diversity of the individual communities of Central Queensland, and are underpinned by the principles of participation, collaboration, intergovernmental cooperation, equity, accountability, integrity, ethics and transparency.	Not directly applicable.

C3 Vegetation Clearing

Development Approval applications for Material Change of Use that require clearing of remnant native vegetation must be referred to Department of Natural Resources and Mines (NRM) as a Concurrence Agency. NRM has developed a policy for assessment of such applications, being the *Concurrence Agency Policy for Material Change of Use* (June 2005).

Part A of the policy applies to non-urban land.

For endangered and of concern regional ecosystems, the policy requires these to be conserved unless:

- A project is declared to be a significant project under the State Development and Public Works Organisation Act 1971
- Essential community infrastructure for which there is no suitable alternative site for meeting the community need for essential community infrastructure
- An extractive industry in a resource processing area or key transport route in a Key Resource Area
- An MCU from a rural to environmental use.

For not of concern regional ecosystems, in addition to the exemptions above, vegetation may be cleared for an MCU that involves establishing necessary built infrastructure.

Where assessment of the proposed Hummock Hill Island development takes place under the *State Development and Public Works Organisation Act 1971*, the policy allows clearing of any remnant vegetation. However, the proponent is committed to meeting the performance requirements for vegetation clearing set out in Part A2 of the policy.

Without providing a detailed analysis of performance of the project against these performance requirements, the following points are made to demonstrate that an acceptable level of performance can be achieved:

- The site has been surveyed and areas of remnant ecosystems that are endangered and of concern have been mapped at a 1:10,000 scale.
- The master plan for the development has been adjusted to ensure that the development footprint avoids endangered or of concern regional ecosystems as far as possible and clearing will only occur where necessary to provide infrastructure connections, for example where a road needs to pass through an area of endangered or of concern vegetation to link together development on either side of that area.
- Existing tracks through these ecosystems will be used where access is required.
- Not of concern regional ecosystems will also be preserved as far as possible within the development footprint by minimising clearing for buildings on individual lots and providing vegetated areas between areas of residential development.
- The proponent is interested in pursuing means by which to ensure the long term conservation of remnant endangered and of concern vegetation on Hummock Hill Island.
- There are no natural wetlands, lakes and springs within 50 metres of the development footprint. There are also no natural streams within the meaning of the policy.
- Clearing of any trees in discharge areas at the toe of slopes will be avoided as far as possible. Vegetation will be retained in areas potentially subject to salinisation and waterlogging.
- Vegetation will be retained on steeper slopes and areas of dispersible soils. An Erosion and Sediment Control Plan will be developed for the site development phase with an emphasis on reinstating all disturbed surfaces as quickly as possible with suitable treatments to prevent long term erosion while also maintaining the natural ecosystem as closely as possible.
- Disturbance of acid sulfate soils will be minimal and will be managed through an Acid Sulfate Soil Management Plan, with strategic reburial the preferred management method, followed by neutralisation.
- Connectivity of vegetation to be retained will be maintained to allow movement of the types of animals that inhabit Hummock Hill Island to occur. Note that Hummock Hill Island is not in itself an important wildlife corridor link as the island is permanently separated from the mainland by water. Fauna on the island is largely birds and larger mammal and terrestrial reptile species such as kangaroos and wallabies that have been able to cross the causeway at very low tides.

C4 Environmental Protection Policies

Four Environmental Protection Policies have been declared under the *Environmental Protection Act 1994*:

- *Environmental Protection (Air) Policy 1997*
- *Environmental Protection (Noise) Policy 1997*
- *Environmental Protection (Water) Policy 1997*
- *Environmental Protection (Waste Management) Policy 2000*.

Among other things, these policies set out the ambient environmental quality requirements for management of air, noise and water components of the environment and the strategic approach to management of waste in Queensland.

For the proposed Hummock Hill Island development, the proponent will require Environmental Authorities to operate water and wastewater treatment systems. In assessing a Development Approval application for these Environmental Authorities, the EPA will consider whether the conduct of these activities will comply with the Policies, and in particular, whether the environmental values identified in the policies can be maintained.

Appendix D

Draft Terms of Reference for Environmental Impact Statement

Hummock Hill Island Development
East Wing Corporation

ABN 79 000 155 591

TERMS OF REFERENCE

November 2005

Contents

Document history and status

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1. Introduction

1.1 The Proposal

East Wing Corporation holds a development lease over approximately 1,200 hectares of land on Hummock Hill Island, located in Rodds Bay in the north east of Miriam Vale Shire. The Island is 30km south of Gladstone and 500km north of Brisbane. The Development Lease was issued by DNRM in March 2005 and covers about 40% of the total land area of the island.

Figure 1 Hummock Hill Island

East Wing Corporation proposes to develop an ecological community of approximately 4,000 people within this lease. The natural values of the island make it an attractive location for such a development, provided that the development is consistent with these values and fits within the natural constraints and opportunities offered by Hummock Hill Island.

The conceptual framework for the community is based on living in harmony with natural systems and residents will take responsibility for managing their own ecological footprints. Management of water, wastewater and energy supply services will be based at the household and local community levels, taking advantage of a number of innovative technologies that are now being applied successfully at this level. Householders attracted by the natural values of the Island and its surrounds will be committed to conducting their own activities to ensure protection of these values and the 21st Century village will provide the infrastructure systems to allow this to happen.

A community of about 4,350 people, and a development offering a range of lifestyles and residential options will allow diverse and dynamic social systems to develop, providing the social cohesion and support recognised as being increasingly important to quality of life in the 21st Century village.

The proposed Hummock Hill Island community comprises the following components:

- 1550 residential allotments
- 181 residential units
- 200 room Hotel

- 40 Condos
- Education Campus
- Town Centre
- Airport for light aircraft
- 18 hole golf course with associated clubhouse
- Village centre
- Marine centre with boat ramp

The Master Planning approach, to ensuring sympathy and harmony with the natural environment, proposes a number of different development "units" which provide a combination of high, medium and lower density development and various recreational, educational and commercial activity centres which can be arranged to fit with the natural environmental features. The final location of each of these units is flexible and will be determined once mapping of vegetation, drainage systems and soils is complete.

For Hummock Hill Island, a comprehensive set of controls and guidelines for living within the natural environment will be produced. These are likely to include:

- Building envelopes on larger lots requiring retention of vegetation outside the area designated for construction of houses, outbuildings and access
- Conservation covenants or similar controls over land of high conservation significance
- Guidelines advising on preferred landscaping species and maintenance of remnant vegetation on and adjacent to residential lots.

Access to the Island is from Turkey Beach Road, Foreshores Road and Clarke's Road with a causeway to the island. Access will require some upgrading of existing roads and a gateway entry bridge at the southern end of the island is proposed in the Master Plan and is a requirement of the lease. Near the bridge are the Village and Marine Centres and close access to the golf course. The Town Centre forms the northern hub in the community with the Education Campus and the Hotel.

Major environmental impacts of residential development are typically associated with water and energy consumption and waste generation. The underlying intent for infrastructure and facilities for these services will be to maximise self sufficiency at the household, community and Island level, with as little dependence on outside sources as possible. Contingencies would be available for drought periods and emergencies such as fire fighting. Some of the key concepts to be explored further in the master planning and infrastructure planning include:

- Water sensitive urban design, which recognises the importance of managing the entire water cycle in urban areas to maintain water quality and other environmental values
- Harvesting of stormwater, particularly through roof top catchments
- Water reuse and recycling at household, community and Island level

- Other water supply options
- Renewable energy, including household based solar energy and wind turbines (preferably with grid connection to allow back up power and also sale of surplus to the grid)
- Lower impact sources of energy such as natural gas or LPG
- Waste avoidance practices, waste reuse and recycling activities both on and off the island.

Infrastructure alignments would typically follow existing roads. Underground power transmission will minimise visual impact.

1.2 About these Terms of Reference

The draft Terms of Reference (ToR) are for the Hummock Hill Island Community Development, and relate to the assessment of the impacts on the environment of the proposals as described in this document.

The ToR have been compiled for compliance with the Queensland *State Development and Public Works Act 19719?*. Reference was also made to the *Generic Terms of Reference for EIS Studies (EPA 2002)*.

The objective of the legislation is to ensure that matters affecting the environment to a significant extent are fully examined and take into account decisions by the Commonwealth and Queensland Governments.

In these ToR, the term 'environment' refers to all aspects of the surroundings of human beings, whether affecting human beings as individuals or in social groupings, including:

a) Ecosystems and their constituent parts, including people and communities;

b) All natural and physical resources;

c) The qualities and characteristics of locations, places and areas, however large or small, that contribute to their biological diversity and integrity, intrinsic or attributed scientific value or interest, amenity, harmony and sense of community; and

d) The social, economic, aesthetic and cultural conditions that affect, or affected by, things mentioned in items (a) to (c).

In preparing the EIS, the proponent should be cognisant of the following aims of the EIS and public review process:

- To provide a source of information from which interested individuals or groups may gain an understanding of the proposal, the need for the proposal, the alternatives, the environment which it would affect, the impacts that may occur and the measures to be taken to minimise these impacts;
- To provide a forum for public consultation and informed comment on the proposal;
- To provide a framework in which decision-makers can consider the environmental aspects of the proposal in parallel with economic, technical and other factors.

The ToR describes those matters which are to be addressed in the EIS. The EIS document should give priority to the major issues associated with the proposal. Matters of lesser concern should be dealt with only to the extent required to demonstrate the matter has been adequately considered and addressed.

It is envisaged that the EIS will be based on the results of available research, studies and data, with further studies being conducted where necessary or practicable. The extent to which any limitations of available information may frustrate the conclusions of the environmental assessment should be discussed.

In this ToR, the terms "description" and "discussion" should be taken to include both quantitative and qualitative matters and be practicable and meaningful. Similarly, adverse and beneficial effects should be presented in quantitative and/or qualitative terms as appropriate.

The main text of the EIS should be written in clear, concise style that is easily understood by the general reader. Technical jargon should be avoided wherever possible. Detailed technical information necessary to support the main text should be included as appendices issued with the EIS, so that the document is complete and self-contained. Cross-referencing should be used to avoid unnecessary duplication of text, but needs to be cross-checked for accuracy.

Where appendices include results of studies conducted in preparing the EIS, the public availability of the studies should be indicated.

The EIS must cite references and a list of individuals and organisations consulted during the preparation. Relevant maps and illustrations should also be included, but the cost of the Draft EIS to the public should be minimised by using black and white figures wherever possible.

Once finalised, copies (number to be advised) of the EIS should be lodged with the relevant Government authorities for distribution to advisory bodies for comment and review during the public review period. A quantity of the EIS should also be prepared for distribution to relevant libraries. The EIS documents should be made available in CDRom format, however, a quantity of hard copy documents should also be produced. The document should be made available for viewing over the Internet. Further advice on arrangements for public review will be provided closer to the date.

While every attempt has been made to ensure that this ToR addresses all the major issues associated with the proposal, they are not necessarily exhaustive and should be interpreted as excluding from consideration matters deemed to be significant but not incorporated in them or matters (currently unforeseen) that emerge as important or significant from environmental studies, or otherwise, during the course of preparation of the EIS.

2. EIS Overview

The EIS needs to include:

1. Executive Summary
2. Table of Contents
3. Introduction, providing a clear and specific description of the Proposal and EIS process, including construction and operational aspects
4. Proposal Justification including discussion of alternatives and demonstration of need and demand
5. Planning and approvals framework
6. Description of existing physical, biological and social environmental features
7. Assessment of the likely impact of the proposal on the existing features, including proposed mitigation measures;
8. Details of public involvement and consultation programs, including a list of advisory agencies consulted or otherwise involved
9. Conclusion and recommendations
10. Supporting information including References and bibliography; Glossary, abbreviations and units used in the text
11. Appendices, including the finalised ToR, technical studies and results.
12. An outline of the proposed Environmental Management Plan (EMP) for construction and operation, with the ability for the EMP to exist as a stand alone document

3. EIS Executive Summary

The EIS should include a concise Executive Summary of the matters discussed in the main body of the document, to allow the reader to obtain a clear understanding of the proposal and its environmental implications. The Executive Summary should generally follow the format of the EIS and should enable the reader to quickly gain a general understanding of:

- The proposal;
- The legislation under which the proposal is to be assessed
- Natural environmental values of the lease area;
- Potential environmental impacts;
- Proposed environmental protection measures and safeguards;
- Community attitudes;
- Stakeholder engagement; and
- Environmental Management and Monitoring Procedures.

This section is to be prepared in a format which allows it to be separated from the body of the main EIS. It should be sufficiently comprehensive so that it can be read as a stand-alone document. The writing style is to be aimed at a level understood by a general reader.

Maps and figures should be included to the extent that they clarify matters raised in the text.

4. Introduction

The Introduction to the EIS should provide:

- Details of the proponent and any joint venture partners
- A clear definition of the proposal and its objectives
- A clear definition of the study area and regional setting for the proposal (physical, biological, social and built environment), with maps to illustrate as appropriate
- A brief explanation of the scope, structure, process and legislative basis for the EIS.
- A brief description of studies/surveys/consultations (including the identification of baseline data collection requirements) conducted in developing the proposal and preparing the EIS.
- A description of the public notification requirements for the Proposal and the means by which public submissions may be made.

4.1 Project Definition

This section should describe the proposal in sufficient detail to allow the reader to gain an understanding of all stages of the proposal, and assist in determining environmental impacts associated with the proposal.

The description should include the use of aerial photographs, maps, figures and diagrams (with a scale), where appropriate. Reference should be made to detailed technical information in appendices, where relevant.

4.1.1 The Site

A brief overview of the project site should be presented, showing existing natural and human made features (including existing infrastructure and improvements) and relevant named locations. Maps should be included as necessary to illustrate the site.

Site context should also be discussed in terms of distances from nearby towns and urban centres and other key locations of the region.

4.1.2 Land Tenure

Land tenure of the site should be described, including any conditions on leases and other relevant information.

Describe the Native Title status of the site.

4.1.3 Overall Development

A description of the overall concept and development plans should be provided, including details on the following matters, with appropriate illustrations:

- The overall concept plan;

- The proposed Master Plan layout described in words and plans, illustrating all the components;
- Expected resident and visitor population including day visitors and overnight stays;
- Accessibility and transportation systems and networks, including roads, footpaths, cycle paths, buggy paths and equestrian paths;
- Provisions for visually and mobility impaired people;
- Landscaping and reinstatement of disturbed areas;
- Details of fuels and other chemicals stored and/or used including quantity, chemical characteristics and classifications and storage requirements;
- Methods for protecting environmental values within the overall development site and surrounding areas;
- Provision of infrastructure and essential services, including anticipated demand for infrastructure and essential services (including water, power, roads, telecommunications, waste) during construction and operation;
- Provision of community infrastructure and services in the public and private sectors, including commercial facilities, recreational, education and health services;
- Potential revenue (direct and indirect) to investors, developers, contractors, local and State governments and other parties from construction and operation;
- Development and construction schedule;
- Anticipated direct employment opportunities during construction and operation;
- Construction techniques and issues;
- Decommissioning and rehabilitation
- Estimates of operations staff (permanent and temporary and dependants), contractors, movements, travel arrangements, composition, expected sources and local availability of employees.

4.1.4 Residential Development

A description of the concept and development plans for the Residential Development component should be provided, including details on the following matters, with appropriate illustrations:

- The proposed layout of the residential development components, described in words and plans;
- Specific characteristics and attributes of the residential and associated open space precincts, including:
  - Proposed facilities, buildings and other constructed features, including identification of those available for public access;
  - Building parameters and restrictions, architectural and urban design features, natural hazard design parameters;
  - Capacity and/or proposed densities;

- Access and parking;
- Crime Prevention Through Urban Design measures
- Proposed land tenure of each precinct.

4.1.5 Hotel

Specific characteristics and attributes of the hotel including:

- Proposed hotel facilities, building type and other constructed features, including identification of those available for public access;
- Building parameters and restrictions, such as height, architectural and urban design features, natural hazard design parameters;
- Capacity (for example, type and number of rooms);
- Hours of operation;
- Access and parking;
- Proposed land tenure and/or management of the hotel;

4.1.6 Golf Course

Specific characteristics and attributes of the golf course, including:

- Construction earthworks and ongoing maintenance requirements;
- Building parameters and restrictions, architectural and urban design features and role of the proposed club house, natural hazard design parameters
- Hours of operation (where relevant)
- Proposed management and membership structure
- Golf course operation, including irrigation, pest management and fertilisation.

4.1.7 Town and Village Centres

Specific characteristics and attributes of the commercial components, including:

- Intended role of and relationship between the town and village centres;
- Proposed facilities, buildings and other constructed features, including identification of those available for public access;
- Proposed gross floor area and tenancy mix;
- Building parameters and restrictions, architectural and urban design features, natural hazard design parameters;
- Hours of operation (where relevant);
- Crime Prevention Through Urban Design measures
- Access and parking; and
- Proposed land tenure and/or management of each centre.

4.1.8 Education Campus

The design, construction and operation of the Education Campus should be discussed, including:

- Location and layout of the campus;
- Likely range of activities to be carried out;
- Organisations involved in activities, links with similar facilities elsewhere in Australia and internationally;
- Description of the Education Campus, including:
  - Proposed facilities, buildings and other constructed features, including identification of those available for public access
  - Building parameters and restrictions, architectural and urban design features, natural hazard design parameters
  - Capacity
  - Hours of operation
  - Access and parking
  - Proposed land tenure
  - Access for mobility and visually impaired people
  - Landscaping and reinstatement of disturbed areas
- Methods for protecting environmental values within the Campus and surrounding areas
- Decommissioning and rehabilitation
- Estimates of operations staff (permanent and temporary and dependants), contractors, movements, travel arrangements, composition, expected sources and local availability of employees.

4.2 Infrastructure and Essential Services

Describe and discuss each for construction and operation:

- Water supply, including source, distribution and anticipated demand and provisions for ongoing management and maintenance and demand management
- Electrical power supply, including source/generation and anticipated demand and provisions for ongoing management and maintenance
- Wastewater collection, treatment and disposal, including estimated quality and quantity of wastewater generated
- Telecommunications including means of supply and anticipated demand
- Solid waste generation, including estimated quantity and likely composition
- Solid waste management including reduction, reuse, recycling, treatment and disposal
- Hazardous waste generation, including estimated quantity and likely composition

- Hazardous waste management including reduction, reuse, recycling and treatment and disposal
- Access to the island, including links with regional arterial roads and bridge connecting the Island with the mainland
- Access within the island including road designs and cross sections, intended traffic levels, road surfaces
- Road network and traffic management including provisions for ongoing management and maintenance
- Drainage and stormwater management including provisions for ongoing management and maintenance
- Management of parks, public open space and public facilities such as picnic areas, car parks and beach access
- Management of weeds and pests, including biting insects.

4.3 Construction Requirements

This section should describe the construction of each component of the Proposal and associated facilities, including:

- Size, source and control of the construction workforce, accommodation and safety requirements
- Transport infrastructure requirements for construction and transportation/ material logistics
- Materials fabrication works (eg concrete batching plants), details of air, water and waste emissions
- Construction standards, techniques, and Project management, including construction staging, if appropriate
- The sources, quantities, transport and storage of construction materials on and off-site.
- The nature, scale and timings for earthworks, including any borrow pit or quarry requirements (and the potential to disturb acid sulfate soils)
- The nature, scale and timings for vegetation clearance, with cross-references to the vegetation types
- Any near shore operations, including need for dredging, and construction of any marine support facilities
- An outline of overall environmental site management arrangements (dust and other air emissions, noise, runoff, erosion, earth stabilisation, aquifer dewatering, acid sulfate soils, spills, fire, disposal of wastes both on and off the island, effluent, heritage and cultural sites, emergencies, rehabilitation of construction areas)
- The quantity of freshwater required for construction purposes and the sources from which this water will be obtained

- Estimates of construction workers (permanent and temporary and dependants), contractors, movements, travel arrangements and composition, expected sources and local availability of employees.

5. Project Justification

This section should discuss all components of the Proposal in the context of regional and local development and market potential, and the existence of similar developments at these levels.

Discussion needs to include identification and assessment of alternatives as well as demonstration of need from a social and economic perspective and demand from a market perspective.

5.1 Assessment of Alternatives

The assessment of alternatives needs to demonstrate that the Hummock Hill Island location for the proposed residential community is a suitable location for a development of this type considering the major costs and benefits, including environmental and social costs and benefits and the local and regional scale.

The EIS should outline the basis for selection of the Hummock Hill Island location. It should describe any feasible alternatives to the Project, as well as the alternative of not proceeding with the Project. These alternatives should be discussed in sufficient detail to make clear the reasons for pursuing the Hummock Hill Island option.

Alternatives considered may include:

- The 'no project' option;
- Alternative master planning and site arrangements;
- Larger or smaller scale development;
- Alternatives for infrastructure and essential service provision, including the range of options considered for access, water, electricity, and waste management.

The reasons for choice of the preferred option should be explained, including a comparison of the adverse and beneficial effects (both to the environment and community) used as a basis for selection, and compliance with government policy and with the principles and objectives of ecologically sustainable development.

5.2 Demonstration of Need and Demand

The demonstration of need and demand should be a comprehensive assessment including:

- An assessment of the demographic profile for the region and locally, provides the basis for arguing need based on community characteristics
- Estimated population and growth trends including age profiles
- Building investment (lot creation, take up rates and dwelling unit approvals)
- Labour force, employment (by occupation and income)
- Any other economic indicators to indicate support for the development
- Educational needs

- Relevance of the proposed educational facility to the locality and region and demonstration that the facility is complementary to other educational opportunities in Queensland and does not duplicate educational opportunities that could be more efficiently provided at other educational facilities.
- Describe site in regional context – proximity to major centres, transport facilities – airports, train stations, road access – include review of similar residential developments and associated facilities in the surrounding area and if possible make comment on their success
- Describe the local context – role (size, facilities and services – including shopping, banking and community services, recreation facilities etc).

This assessment of the items above will then enable conclusions to be drawn regarding the proposed development, including

- Number of allotments – with reference to lot creation, take up rates of allotments in addition to (new dwelling) building approvals locally and in the region.
- Commercial and retail services
- Educational facility
- The 18 hole golf course – context of region, other similar facilities, end users, proposed management and membership structure.
- Hotel in the context of surrounding facilities – economic need and potential patronage on current trends.

6. Planning and Approvals

6.1 Planning Context

This section should provide a brief explanation of the state, regional and local planning context for the proposed development and the subject site.

At a regional level, statutory instruments, plans, strategies and development policies should be identified, including Miriam Vale Shire [transitional] Planning Scheme and supporting documents.

For each relevant plan, policy, strategy or statutory instrument identified, discuss:

- Restrictions on land use or other matters imposed by the policy, strategy or statutory instrument
- Allowed uses and compatible uses
- Other matters of relevance to the activities proposed in the proposal, for example tourism and infrastructure development strategies.

The EIS should assess compatibility of the development with the overall intent of the Miriam Vale Strategic Plan and provide justification for over-riding the planning scheme. Should the Draft IPA compliant planning scheme be available within the time frames of the environmental assessment, reference should be made to any additional outcomes or intents reflected in the Draft planning scheme.

The following policies of the Wide Bay Burnett Regional Framework for Growth Management should be addressed in the EIS:

- 6.1 Remnant native vegetation
- 6.2 Riparian vegetation
- 6.3 Native wildlife
- 6.5 Fish and fisheries
- 7.1 Places of major environmental and cultural heritage value
- 8.1 Preferred settlement pattern for region
- 8.2 Preferred settlement pattern for region
- 8.4 Residential living opportunities
- 9.2 Road transport facilities
- 10.1 Development sequencing

- 10.2 Regional water supply
- 10.3 Rural community water and sewage
- 11.2 Indigenous local heritage
- 12.1 Community services
- 12.2 Social impacts

In addition, an assessment of the contribution of the proposed Hummock Hill Island development to the outcomes identified in the Central Queensland Regional Growth Management Framework (Central Queensland: A New Millenium) should be provided with particular reference to the following policy areas:

- Land use planning and management (3.1.1)
- Coastal planning and management (3.1.9)
- Existing and emerging industries (3.2.1)
- Tourism (3.2.13)
- Regional identity marketing and promotion (3.4.1)
- Housing (3.4.4)
- Social infrastructure and social planning (3.4.5)
- Individual, family and community vitality (3.4.8)
- Healthy lifestyles (3.4.9)
- Education and training (3.5.1)
- Research and development (3.5.3)

In relation to the RGMFs, assess the potential impact of the proposed development on the commercial centre hierarchy set out in the Central Queensland and Wide Bay Burnett RGMF should be assessed.

An assessment of compliance of the proposed development with the principles and policies of the State Coastal Management Plan should be undertaken, with particular focus on the following policies:

- 2.1.2 Settlement pattern and design

- 2.1.12 Managing water resources
- 2.2.2 Erosion prone areas
- 2.3.1 Future need for access
- 2.3.2 Design of access
- 2.4 Water Quality
- 2.5 Indigenous Traditional Owner cultural resources
- 2.8.1 Areas of state significance (Natural Resources)
- 2.8.2 Coastal wetlands
- 2.8.3 Biodiversity

In addition to the State Coastal Management Plan, the following State Planning Policies should be addressed:

- SPP 1/92 Development and the Conservation of Agricultural Land
- SPP 2/02 Planning and Managing Development Involving Acid Sulfate Soils
- SPP 1/03 Mitigating the Adverse Impacts of Flood, Bushfire and Landslide.

6.2 Approvals

This section should describe and list Commonwealth and State legislation and local policies relevant to the planning, approval, construction and operation of the Proposal. Triggers for the application of each of these should be discussed and relevant approval requirements should be identified.

A brief explanation of the scope and legislative basis for the EIS should be provided, including the role of the EIS in the government's decision-making process and an explanation of the relationship between Part IV of the SDPWOA and the Integrated Development Approvals System of the *Integrated Planning Act 1997* with regard to the Proposal. Brief discussion of the Commonwealth's accreditation of the SDPWOA process, under Section 87(4) of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC) is also required.

Relevant Commonwealth legislation may include, among other things:

- *Environment Protection and Biodiversity Conservation Act 1999;*
- *Native Title Act 1993;*
- *Aboriginal and Torres Strait Islander Heritage Protection Act 1994,*

- *Australian Heritage Commission Act 1975,*
- *Great Barrier Reef Marine Park Act 1975,*
- *Marine Parks Act 1982,*
- *World Heritage Properties Conservation Act 1983,*
- other relevant Commonwealth obligations such as protection of World Heritage, migratory animals (CAMBA, JAMBA and Bonn Convention) and wetlands of international importance (Ramsar).

Relevant State legislation may include, among other things:

- *Aboriginal Cultural Heritage Act 2003*
- *Environmental Protection Act 1994;*
- *Integrated Planning Act 1997;*
- *Vegetation Management Act 1999;*
- *Water Act 2000;*
- *Fisheries Act 1994;*
- *Coastal Management and Protection Act 1995;*
- *Electricity Act 1994;*
- *Forestry Act 1959;*
- *Great Barrier Reef Marine Park Act 1975*
- *Land Act 1994;*
- *Land Protection Act 2002;*
- *Native Title Act 1993;*
- *Nature Conservation Act 1992;*
- *Queensland Heritage Act 1992;*
- *State Development and Public Works Organisation Act 1971*
- *Transport Infrastructure Act 1994;*
- *Workplace Health and Safety Act 1995.*

Existing environmental assessments and approvals should be discussed. These should include the findings of the 1993 Impact Assessment Study (*Hummock Hill Island Residential and Recreational Development Impact Assessment Study*, 1993 and *Hummock Hill Island Project IAS Supplement*, 1995) and the then Queensland Department of Environment Review (*Review of the Impact Assessment Study for Hummock Hill Island Residential and Resort Development*, 1996).

7. Existing Environment

7.1 Overview

The EIS should include a description of the present physical and socio-economic environment in the vicinity of the proposed residential development. Sufficient detail is needed to allow a clear understanding of the likely impacts of the Project (both beneficial and adverse) and to assess the effectiveness of the proposed mitigation measures.

This section should identify the existing environmental values of the area that may be affected by the Project. The EP Act and the Environmental Protection policies define "environmental values". Environmental values should be described by reference to background information and studies that are included as appendices to the EIS.

7.2 Topography, Geology and Soils

Describe:

- geological characteristics of the island;
- location and characteristics of the known mineral resources;
- topographical and geomorphological characteristics;
- broad soil classifications, particularly focussed on erosion potential and potential land irrigation of effluent;
- land capability for various agricultural uses, assessed in accordance with *State Planning Policy 1/92: Development and Conservation of Agricultural Land* and associated guidelines;
- coastal morphology and stability issues;
- potential erosion risk
- potential for acid sulfate soils, assessed in accordance with *State Planning Policy 2/02: Planning and Management Development Involving Acid Sulfate Soils;* and
- potential for existing soil contamination.

7.3 Climate and Natural Hazards

Describe:

- Climate and climatic characteristics (wind speed and direction, seasonal temperatures, humidity, evaporation and rainfall)
- Severe weather conditions such as rain events, high wind events, lightning, cyclones, storm surge and the probability of extreme events
- Earthquake potential.

7.4 Terrestrial Ecosystems

In these ToR, "terrestrial" is taken to include ecosystems on land and freshwater ecosystems extending to the mean High Water mark. Coastal and estuarine ecosystems are to be considered

as marine ecosystems. The need to ensure that the transitional zone between terrestrial and marine ecosystems is properly assessed is highlighted.

Identify and describe any conservation areas, nature reserves or other areas declared for the protection of terrestrial ecosystems located within or adjacent to the study area. Discuss status and management of these areas.

Identify existing terrestrial ecosystems within the study area, including:

- Identification and description of ecological communities using the Regional Ecosystem classification established under the *Vegetation Management Act 1995*;
- Identification and description of habitat value of each community or Regional Ecosystem;
- Identification and description of rare and endangered species, including conservation status, distribution, population viability and habitat requirements;
- Discussion of the condition of remnant vegetation including extent of regrowth and presence of weeds.
- Identification of migratory species;
- Identification and description of unusual assemblages, associations and other noteworthy features;
- Assessment of local and regional representation of communities identified;
- Assessment of biodiversity and conservation significance; and
- Identification of data on mosquitoes and biting insects which may pose a health risk to human inhabitants.

Identify and describe any potential groundwater dependent ecosystems.

Study of existing terrestrial ecosystems may be based on previous studies and literature reviews, review of relevant databases and additional field surveys, as necessary, to supplement existing information. Describe methodologies used for data collection.

7.5 Coastal and Marine Ecosystems

In these TOR, coastal and marine ecosystems include coastal and estuarine ecosystems seaward of the mean High Water mark. The need to ensure that the transitional zone between terrestrial and marine ecosystems is properly assessed is highlighted.

Identify and describe any conservation areas, nature reserves or other areas declared for the protection of coastal and marine ecosystems located within or adjacent to the study area. Discuss status and management of these areas.

Describe existing marine and coastal ecosystems within and immediately adjacent to the study area, including:

- Identification and description of ecological communities;
- Identification and description of habitat value of each community;

- Potential for rare, endangered or migratory species to occur in identified habitats.

Study of existing coastal and marine ecosystems may be based on previous studies and literature reviews and review of relevant databases. Additional field surveys may be necessary for any areas of direct disturbance.

7.6 Surface Waters

For the purposes of this ToR, surface waters include fresh and brackish streams, estuaries and other enclosed waters. Describe existing surface waters, including:

- Water quality
- Water quality objectives
- Existing contaminant sources
- Hydraulic characteristics, flows and tidal influences
- Catchment and storm water runoff characteristics
- Current users of surface waters.

7.7 Marine Waters

For the purposes of this ToR, marine waters refer to open areas of salt water. Describe existing marine waters, including:

- Water quality
- Water quality objectives
- Flow regimes
- Existing contaminant sources.

7.8 Groundwater

Describe existing groundwater conditions within the vicinity of the Proposal including:

- Groundwater quality
- Aquifer yield and recharge characteristics
- Other aquifer characteristics, including depth to groundwater
- Likely interactions between groundwaters and surface waters and groundwaters and marine waters
- Existing users of groundwater within the study area
- Existing sources of groundwater contamination or other existing impacts on groundwater.

Additional groundwater sampling may be required if any direct use of groundwater is proposed.

7.9 Coastal Processes and Coastal Hazards

Describe the coastal processes and conditions experienced on Hummock Hill Island including:

- Beaches and dune systems and identify those that provide protection from inland erosion;

- Coastal wetlands;
- Storm tide flooding, cyclones and associated processes (mapping of storm tide hazard area);
- Erosion prone areas.

7.10 Land Use Planning

Describe existing land uses on and adjacent to Hummock Hill Island. Include uses of coastal and marine areas. Describe the land tenure over any areas likely to be directly or indirectly affected by the proposal. Describe any areas declared for the protection of natural resources including ecological and mineral resources.

7.11 Visual Environment

Describe and characterise the existing visual environment and landscape values of the region, with particular attention to Hummock Hill Island.

Identify the viewshed of Hummock Hill Island from land and sea. Identify and describe viewers likely to be viewing the island from various locations within the viewshed.

7.12 Cultural Heritage

7.12.1 Aboriginal Cultural Heritage

Identify and describe any cultural heritage values associated with any locations within the study area. Values may include:

- Artefacts of Indigenous origin
- Other evidence of Indigenous settlement and/or activities.

Identification of cultural heritage values should include review of literature and existing studies of the area as well as additional survey work to supplement existing information if required. Representative Indigenous groups should be consulted and involved in the study in accordance with the procedures set out in the *Aboriginal Cultural Heritage Act 2003*.

The significance of sites, artefacts and other features should be evaluated on the basis of:

- Integrity
- Representativeness (local, regional, State)
- Scientific/historical importance
- Importance to traditional owners.

7.12.2 European Cultural Heritage

Identify and describe any cultural heritage values associated with any locations within the study area. Values may include:

- Artefacts or other evidence of early European settlement of the area
- Valuable features associated with more recent use of the land.

Identification of cultural heritage values should include review of literature and existing studies of the area as well as additional survey work to supplement existing information if required.

The significance of sites, artefacts and other features should be evaluated on the basis of:

- Integrity
- Representativeness (local, regional, State)
- Scientific/historical importance.

7.13 Social

7.13.1 Demographic Profile

Prepare a demographic profile of the region including:

- Population and population growth
- Age and gender structure
- Workforce characteristics and employment levels
- Income and other lifestyle characteristics.

Demographic statistics should be broken down by local government area (Miriam Vale and Calliope Shires and Gladstone City). The Queensland state average should be provided for comparison.

Prepare a brief summary of the local and regional economic structure including the main industrial and commercial activities.

Identify and describe community services, facilities and infrastructure in the region and assess the adequacy of such services to meet existing community demands.

7.13.2 Affected Stakeholders

Identify and briefly describe stakeholder groups likely to be affected directly or indirectly by the Proposal, including those using the area for recreational, tourism, research, scientific and educational purposes.

Future inhabitants, visitors and employees on Hummock Hill Island should also be included as stakeholder groups.

7.14 Waste Management Services

Identify existing public and private waste management services and facilities available in the region, including:

- Waste reuse and recycling services
- Waste treatment facilities
- Waste disposal facilities

- Waste collection and transport facilities.

7.15 Air Quality and Noise

Describe the existing noise environment in the study area in terms of:

- Existing noise and vibration sources
- Estimated background noise and vibration levels
- Identify sensitive receptors (humans and other animals).

Describe the existing air quality within the Study area and surrounding areas including:

- Existing sources of air pollution
- Estimate ambient air quality characteristics
- Identify sensitive receptors (humans and other animals).

7.16 Infrastructure and Services

Roads and Traffic

The existing local and regional road network should be described. Capacity of roads and intersections should be identified. Traffic generation nodes should be identified.

Existing traffic levels on local and regional roads should be described. Traffic volumes should be broken down into vehicle types (for example, cars, light trucks, heavy trucks).

Other Transportation Infrastructure

Airport, port and rail infrastructure should be described in terms of location, capacity and other relevant features. Shipping routes and recreational boat access points should also be identified.

Power

Existing power generation facilities and transmission and distribution networks should be described and mapped at the local and regional level. Description should include:

- Location
- Capacity.

Telecommunications

Existing telecommunications networks including mobile phone and broadband in the locality and region should be described in terms of location and capacity.

Water Supply

Existing water supply infrastructure should be described at the local and regional level. Discussion should include Awoonga Dam and existing fresh water distribution infrastructure.

8. Impact Assessment and Mitigation

8.1 Topography, Geology and Soils

Discuss impacts of the Proposal on the existing environment as described in **Item 7.2,** including:

- Potential for contaminated land and/or potential acid sulphate soils to be disturbed during construction, including management of the existing (disused) cattle dip located near the northern headland
- Potential for land contamination to affect proposed land uses
- Potential for land contamination to occur as a result of the proposed development
- Acceptability of wastewater irrigation
- Loss of or sterilisation of Good Quality Agricultural Land and other agricultural resources
- Loss of or sterilisation of mineral resources
- Erosion potential
- Landslip potential
- Impacts to landforms and coastal, marine and seabed geomorphology

Make recommendations to mitigate potential adverse impacts.

8.2 Climate and Natural Hazards

Discuss potential for climatic conditions and natural hazards to impact upon the Proposal and proposed measures to ensure safety of humans, structures and other facilities on the island. Discuss potential for extreme climatic conditions to lead to spills and leaks of chemicals or other damage to the environment as a result of the presence of the proposed development. Discuss the extent to which weather conditions may enhance or detract from the Proposal.

8.3 Terrestrial Ecosystems

Identify activities to be conducted during construction and operation that may directly or indirectly affect terrestrial ecosystems or individual species. Activities should include, but not be limited to land clearing, effects on water quality and surface water flows, effects on groundwater, bush fire, pest species, domestic animals and noise and light disturbance. Both construction and operation aspects of these activities should be assessed.

Assess impacts of identified activities on:

- Ecological communities and habitat including those within and adjacent to the development
- Groundwater dependent ecosystems
- Individual species
- Rare and endangered species (State and Commonwealth), including an assessment of the extent to which the species' viability and conservation status may be affected as a result of the Proposal
- Biodiversity

- Status and management principles of identified conservation areas.

Assess potential for mosquitoes and other biting insects to pose a health problem to human inhabitants of Hummock Hill Island.

Discuss any cumulative impacts on terrestrial ecosystems, taking into account other land clearing and development activities in the region.

Make recommendations to mitigate potential adverse impacts and provide for ongoing management of potential impacts on terrestrial conservation values.

8.4 Coastal and Marine Ecosystems

Identify activities to be conducted during construction and operation that may directly or indirectly affect coastal and marine ecosystems or individual species. Activities should include (but not be limited to) land clearing and construction works, effects on water quality and freshwater flows, effects on groundwater, weed and pest animals, domestic animals, human access to beach areas and noise and light disturbance.

Assess impacts of identified activities on:

- Ecological communities and habitat
- Individual species
- Rare, endangered and migratory species (State and Commonwealth listed), including an assessment of the extent to which the species' viability and conservation status may be directly or indirectly affected as a result of the Proposal.
- Biodiversity
- Recreational and commercial fisheries
- Status and management principles of identified conservation areas.

Discuss any cumulative impacts on marine ecosystems taking into consideration the effects of other developments and activities in the region.

Make recommendations to mitigate potential adverse impacts and provide for ongoing management of impacts on coastal and marine ecosystems.

8.5 World Heritage Area

Provide an assessment of the potential impact of the proposed development on the World Heritage values of the Great Barrier Reef World Heritage Area.

8.6 Surface Waters

Identify and assess impacts on surface waters including:

- Degradation of water quality through sediment release or release of contaminants (link with erosion control issues discussed in **Item 7.6**) during construction and operation. Include

routine, non-routine and accidental releases from all developed areas including the golf course.

- Changes in surface water runoff characteristics including quality and quantity of flows into coastal ecosystems.
- Changes in freshwater input to estuaries and nearshore coastal waters.
- Effects on current water users.
- Cumulative impacts of releases to surface waters as a result of the Proposal in conjunction with other existing impacts on surface water quality and flow.

Make recommendations to mitigate potential adverse impacts.

8.7 Marine Waters

Identify and assess impacts on marine waters including:

- Degradation of marine water quality through sediment release or release of contaminants (link with erosion control issues discussed in **Item 7.7**) during construction and operation. Include routine, non-routine and accidental releases;
- Changes to flow regimes; and
- Cumulative impacts of releases to marine waters as a result of the Proposal in conjunction with other existing impacts on marine water quality.

Make recommendations to mitigate potential adverse impacts.

8.8 Groundwater

Identify and assess impacts on groundwaters including:

- Degradation of water quality including saltwater intrusion
- Mobilisation of existing saline groundwaters
- Impacts on any groundwater dependent ecosystems
- Changes to aquifer yield, recharge or other characteristics
- Changes to the nature of interactions between aquifers and surface or marine waters
- Effects on existing groundwater users
- Cumulative impacts of impacts associated with the Proposal in conjunction with existing impacts on aquifers.

Make recommendations to mitigate potential adverse impacts.

8.9 Coastal Processes and Coastal Hazards

Describe the potential impacts caused by the Proposal, in accordance with the State Coastal Management Plan, including careful consideration of the potential impacts of climate change including sea level rise and storm tide inundation and existing areas affected by coastal hazards. Describe impact on coastal processes from built structures such as boat ramp(s), bridge or any

other works in the coastal zone. Discuss any development within or adjacent to the Erosion Prone Zone.

Make recommendations regarding areas to be retained undeveloped and excluded from the master plan development area, where relevant.

Make recommendations to mitigate adverse impacts identified.

8.10 Land Use and Tenure

Describe the potential impacts caused by any short, medium and long-term changes, interruption, alteration or curtailment of land uses and activities due to operation of the Proposal, including changes affecting local communities, traditional uses, recreational uses, primary production, commercial fishing, tourism, mining and extractive industry.

Identify and examine potential conflicts between the Proposal and plans, policies, strategies and statutory controls. Propose measures to resolve these conflicts.

Make recommendations to minimise conflicts with adjacent land uses.

8.11 Visual Environment

Present photomontages or artist's impressions of the proposed developments on Hummock Hill Island from several viewing locations on land and at sea.

Discuss the changes to the visual environment as a result of the Proposal, and in particular, changes to views from the World Heritage Area.

Make recommendations to mitigate adverse impacts identified.

8.12 Cultural Heritage

Identify and assess direct and indirect impacts of the Proposal on cultural sites, artefacts and other features. Assessment should cover construction and operation phases of the Proposal. Assessment should include an assessment of cumulative impacts.

The views of Indigenous people concerning the proposal should also be documented.

Prepare an outline Cultural Heritage Management Plan for the Proposal in accordance with the requirements of Part 7 the *Cultural Heritage Act 2003*.

Make recommendations as appropriate to mitigate impacts on cultural heritage.

8.13 Social Environment

Identify and assess impacts on social and socio-economic features including (but not limited to):

- Demographic profile
- Workforce and employment opportunities

- Availability of and access to community services, facilities and infrastructure (medical, dental, other health services, emergency health services, education, child care, emergency services)
- Educational opportunities
- Changes in access to land and sea areas
- Lifestyle and activities, including issues associated with remoteness from existing activity centres.
- Recreational opportunities and access to beach foreshores and public open space.
- Health and safety (including potential impacts associated with biting insects)

Assess the range of impacts on each of the stakeholder groups identified in **Item 7.14.2**. Include assessment of cumulative impacts. Include any impacts relating to increased demand for community facilities and infrastructure (eg schools, hospitals, emergency services) and identify where new and upgraded facilities and infrastructure may need to be brought forward.

Make recommendations to enhance benefits and mitigate adverse impacts identified.

8.14 Hazard and Risk

8.14.1 Identification of Hazards

Likely hazards associated with the construction and operation with each component of the should be identified. These should include:

- Natural hazards and disasters such as storm surge, bush fire
- Accidents and incidents such as traffic accidents, crimes against persons or properties, house fires.
- Spills, leaks and explosions associated with chemical transport, handling and storage activities

An analysis should also be made of the location and sensitivity of receptors that may be exposed to hazards. These may include:

- Humans (residents, tourists, visitors, employees at the facility, observers) on Hummock Hill Island and other locations within the vicinity
- Animals in the marine or terrestrial environment, in particular rare and endangered species
- Natural resource conservation areas and ecosystems
- Air and sea traffic
- Communications facilities and networks.

Note that occupational health and safety issues are outside the scope of these ToR.

8.14.2 Risk Management Strategies

Details should be provided of proposed risk management strategies to minimise risk exposure for each of the hazards identified. These should include (but not be limited to):

- Storage and handling requirements for dangerous goods
- Emergency management and response plans and provision of emergency services
- Ability of existing emergency services to provide prompt and efficient response to emergencies and need for upgraded services to provide adequate risk management.

8.14.3 Risk Assessment

A risk assessment methodology should be developed to allow proper examination of the risk of exposure of sensitive receptors to the hazards identified. A qualitative risk assessment methodology may be used for some aspects of the risk assessment.

Risk assessment methodology and underlying data and assumptions should be transparently documented and examples and comparisons should be made which will allow the general reader to understand the nature and magnitude of the risks involved.

The assessment of risk associated with the identified hazards should take into account the risk management strategies identified in **Item 8.41.2**. The risk assessment study should also consider cumulative risk contours from any existing non-natural hazards not directly related to the Proposal.

Detailed technical studies should be included as appendices.

Where unacceptable levels of risk are identified, develop further strategies to reduce risk to acceptable levels.

8.15 Waste Management Services

8.15.1 Predicted Waste Generation

Identify all solid, liquid, hazardous and other wastes expected to be generated during construction and operation. For each waste stream, document:

- Source and location
- Physical and chemical characteristics
- Estimated quantity
- Special storage and management requirements
- Options for waste management, based on the waste management hierarchy (reduce, reuse, recycle, treat, dispose)
- Preferred waste management option
- Fallback waste management option.

8.15.2 Waste Management

Describe the waste management facilities required to provide an adequate level of service to protect community and ecosystem health. Waste management should be discussed in the context of the Waste Management Hierarchy.

The following matters should be specifically addressed:

- Provision of waste collection and/or transfer stations and ultimate disposal of waste.
- Treatment systems for wastewater
- Disposal of treated wastewater, including an outline management plan for effluent irrigation.

For wastewater treatment and management, compliance with the following policies and guidelines should be included:

- Guidelines for the Use and Disposal of Greywater in Unsewered Areas (DLGP 2003).
- On-site Sewerage Code (DLGP, November 2003)
- On-site Sewerage Systems Guidelines for Effluent Quality (DLGP, January 2004)
- Queensland Guidelines for the Safe Use of Recycled Water (EPA, Public Consultation Draft).

8.15.3 Waste Impacts

Identify and describe potential environmental and socio-economic impacts associated with preferred and fallback waste management options for each waste stream.

Identify potential environmental impacts associated with accidental release of any waste materials during storage, handling or transport.

Include discussion of potential impacts of waste management under normal and abnormal operating conditions on water quality and coastal and aquatic ecosystems under Sections 8.4, 8.5, 8.7 and 8.8. Discuss potential impacts of irrigation of wastewater on soils under Section 8.1.

Make recommendations to mitigate adverse impacts.

8.16 Air Quality and Noise

Identify sources of air pollution (including dust) during construction and operation. Discuss the effects caused by direct and indirect pollution (including greenhouse gases) on ambient air quality and sensitive receptors.

Discuss any cumulative impacts, especially in relation to existing air quality conditions in the Gladstone airshed.

Identify and characterise noise sources associated with the construction and operation of the development. Identify and characterise any sources of vibration.

Discuss impacts of predicted noise levels on existing sensitive receptors as identified in **Item 7.18**. Assess impacts of predicted noise levels on future residents, visitors and other inhabitants of Hummock Hill Island and the surrounding area.

Make recommendations to mitigate potential adverse impacts.

8.17 Infrastructure and Services

Identify and assess impacts of the Proposal on infrastructure as identified. Impact assessment should include:

- The effects of increased demand on infrastructure and essential services
- The need for upgrade of services
- The potential for services to existing users to be affected by the proposal.

The following specific infrastructure issues should be addressed:

- Road networks, and relationship to regional road networks and commercial centres
- Parking requirements, particularly if the proposed commercial centre generates visitors from outside the immediate development footprint
- Provision of public transport
- Availability of water supply including an agreement in principle from a water supply authority to provide water to the proposed development.
- Household and community level water management and water balance, including unusually dry periods
- Adequacy of water supply to allow for private swimming pools, public and private garden maintenance and other water intensive uses.

Where options for infrastructure and services exist, these should be presented, together with the rationale for selecting the preferred option.

Assess cumulative impacts of the Proposal, taking into consideration other developments in the area which may also impact on infrastructure.

Make recommendations to mitigate adverse impacts.

9. Public Involvement and Consultation

This section should describe consultation and assessments undertaken in the course of proposal formulation and preparation of the EIS with:

- Commonwealth and State government agencies;
- Local government;
- Non-government organisations;
- Community groups;
- Individuals; and
- Other stakeholders identified.

This section should record;

- Consultation activities undertaken with the range of stakeholders;
- Outcomes of consultation in terms of response to the proposal, comments and suggestions from stakeholders;
- Means by which concerns and comments raised by stakeholders during consultation are addressed in the EIS; and
- Framework for ongoing consultation activities.

10. Conclusion and Recommendations

The conclusion should present a concise summary of the key findings of the studies undertaken. This should form a statement of the positive and negative impacts of the Proposal on the physical, natural and socio-economic environment.

A summary of all recommendations made in the EIS should be provided, with recommendations presented for design, construction and ongoing operation of the Proposal. The summary should be in the form of commitments from the Proponent.

11. Supporting Information

11.1 References and bibliography

Information cited from other sources in the text should be referenced and full references to these sources provided in the reference list. Other important information sources which may not be directly cited in the document should also be included in the reference list.

11.2 Glossary, abbreviations and units

A glossary defining all technical terms used in the EIS should be provided. Definitions should be in layperson's terms.

A list stating in full all abbreviations and units used in the EIS text should be included.

12. Appendices

Information relevant to the EIS, but not suitable for inclusion in the main text should be included as appendices; for example, detailed technical or statistical information, maps, risk assessment, baseline data and supplementary reports.

A copy of the ToR should also be included and bound into Volume 1 of the EIS.

13. Environmental Management Plans

An outline of the proposed Environmental Management Plans (EMPs) for the Proposal should be included. EMPs should cover all components of the proposed development and associated infrastructure. EMPs should cover detailed design, construction and operation phases of the Proposal.

Environmental management plans (EMPs) should outline the safeguards proposed to prevent damage to the environment or, in the event of unforeseen damages, to rehabilitate the damaged environment. The EIS should draft together all relevant information mentioned in the text, and provide a clear statement of specific commitments that the Proponent will make. It is recognised that the EMPs are unlikely to be finalised documents when the EIS is released, but it is essential that they contain sufficient information to allow an objective assessment of proposed countermeasures.

An outline of any EMPs for the Project should be presented, together with reference to best-practice standards for EMPs. A construction environmental management plan should refer to relevant construction standards, techniques and reference material. Monitoring programs designed to ensure safeguards are being effectively applied and to identify and measure any differences between predicted and actual impacts should be described.

The outline EMPs should generally follow the requirements of AS/NZS ISO 14001:1996 "Environmental Management Systems". The outline EMPs should also be consistent with EPA requirements and guidelines.

The outline EMPs should demonstrate the means by which recommendations of the EIS will be implemented during the design, construction and operation phases. A summary of requirements is shown in **Table 13-1** below.

Table 13-1 EMP Components

EMP Component	Description	Example
Environmental element	The aspect of the environment requiring management consideration	Surface Water
Performance objectives	The target or strategy to be achieved through management	No adverse impacts on freshwater and estuarine ecosystems
Potential impacts	Potential impacts on the environment as identified in the EIS	Release of sediment into surface waters
Management Actions	The actions to be undertaken to achieve the performance objective, including any necessary approvals, applications and consultation	Install erosion control measures
Performance	Criteria against which the implementation of	Comply with ANZECC guidelines for

EMP Component	Description	Example
Indicators	the actions and the level of achievement of the performance objectives will be measured. May include tiered trigger levels to prompt different responses.	aquatic ecosystems
Monitoring	Process of measuring actual performance	Monitor surface waters downstream of construction areas for suspended solids
Responsibility	Responsibility for carrying out management and monitoring actions	Construction Environmental Manager
Reporting	Process and responsibility for reporting monitoring results	Construction Environmental Manager reports to Construction Superintendent weekly using prescribed form.
Corrective Action	Actions to be implemented in the event that non-compliance with performance indicators is detected	Install additional erosion control structures on temporary drains

Appendix E

Existing Environment Description

E1 Land Use and Tenure

E1.1 Development Area

Hummock Hill Island is currently vacant. It has previously been used for grazing, however grazing activities ceased early in the 1990s. There are several fishing shacks on the northern side of the Island which appear to be in use. These have no legal tenure.

The proposed development will take place on Lot 3 on FD841442 over which the proponent holds Special Lease 19/52155.

E1.2 Mining Tenure

There is a current mineral exploration permit (EPM 7164) over much of Hummock Hill Island including part of Lots 3 and other areas of Hummock Hill Island outside the Special Lease as well as other land parcels including Middle Island and areas of Byfield National Park.

An application has also been made for a Mineral Development Licence over much of the island, including much of Lots 1 and 3.

E1.3 Conservation Estate

Hummock Hill Island lies within or adjacent to a number of coastal and marine areas with designated conservation status as listed in Table 7.

Table 7 Conservation Estate

Feature	Location Relative to Hummock Hill Island	Management Implications for Proposal
Great Barrier Reef World Heritage Area	All of Hummock Hill Island is located within the world heritage area which extends to low water mark on the mainland coast and includes most islands of the Great Barrier Reef.	No specific management implications. Location within a World Heritage Area triggers assessment and approval requirements under EPBC Act.
Great Barrier Reef Marine Park	Extends to low water mark around Hummock Hill Island.	General Use Zone. Permits required for structures and discharges.
Great Barrier Reef Coastal Marine Park	Covers the intertidal zone (ie low water mark to high water mark) around Hummock Hill Island.	General Use Zone Permits required for structures and discharges.
Colosseum Inlet Fish Habitat Area	Exclusion zone around existing causeway.	Permits required to disturb Fish Habitat Area including placing structures within.
Rodds Bay Dugong Protection Area	Surrounds Hummock Hill Island.	No specific implications for proposed development. Restrictions on fishing activities.

E2 Water Resources

Hummock Hill Island has no permanent fresh water streams. A number of dams have been created, presumably for stock watering purposes, and continue to store water after rainfall. Only one of these, being located in a saddle between the two main elevated ridgelines, appears to hold permanent water. Water in this dam is of very low salinity. There are no natural lakes or permanent freshwater wetlands. Ephemeral freshwater wetlands occur in the dune swales/vine scrub zones along the northern coastline after rainfall.

A tidal inlet associated with the Boyne Creek estuary effectively divides the island into an east and west portion. There are several other tidal inlets of varying sizes.

Average annual rainfall at Gladstone is 918 mm (35 years of record) and at Bustard Head is 1155 mm year (102 years of record). Rainfall is higher during summer months with average December rainfall at Bustard Head being 196 mm compared to 35 mm in September.

Shallow unconfined groundwater aquifers exist in the sands overlying granodiorite at the eastern and western ends of the island. Groundwater flows are towards the coast. Saline intrusion of these aquifers occurs with salinity levels increasing towards the coast. The groundwater can be considered to be moderately to highly saline in areas adjacent to the coastline. Potable water extraction from these aquifers would require careful management to ensure that sustainable limits were not exceeded and saltwater intrusion is not increased.

E3 Terrestrial Ecosystem

E3.1 Vegetation

The eastern and western ends of the island are dominated by parallel beach ridge vegetation and a mosaic of melaleuca and eucalypt species. Sand dune zones have been somewhat modified by pastoral activities, especially at the eastern and western ends of the island, however native vegetation is considered to remain in good condition. A stand of Littoral Vine Forest in the central northern dune area may also have particular conservation significance due to its good condition and the scarcity of vine forest remnants in the central Queensland area.

The southern side of the island is characterised by an extensive intertidal zone includes mangrove, salt marsh and seagrass communities. The central portion of the island is characterised by a coastal grey ironbark woodland with similar characteristics to vegetation communities found on similar geology in the mainland being a mosaic of eucalyptus woodland/ open forest types, poplar box, E tereticornis and iron bark woodland. An interesting feature is a stand of poplar box, a species which is normally found further inland. Burning and clearing for pastoral activities have disturbed vegetation in this zone and it is probably the least significant habitat zone on the island from a conservation view point.

Littoral scrub and strand vegetation dominates the northern coast of the island.

Weed invasion has occurred, particularly with prickly pear infestations in grazed areas and lantana, thistle and burr in some locations.

Regional ecosystem mapping was undertaken in June 2005. Results are listed in Table 8 and conservation status of the Regional Ecosystems are shown in Figure 14.

Table 8 Regional Ecosystems of Hummock Hill Island

Regional Ecosystem	Description	Conservation Status
12.1.1	*Casuarina glauca* ± *Melaleuca quinquenervia* ± mangroves open-forest. Occurs on margins of Quaternary estuarine deposits.	Of concern
12.1.2	Saltpan vegetation comprising *Sporobolus virginicus* grassland and samphire herbland. Grasses including *Zoysia micrantha* sometimes present in upper portions of tidal flats. Includes saline or brackish sedgelands. Occurs on Quaternary estuarine deposits and marine plains/tidal flats.	Not of concern
12.1.3	Mangrove shrubland to low closed forest. Occurs on Quaternary estuarine deposits.	Not of concern
12.2.2	Microphyll/notophyll vine forest. Occurs on Quaternary coastal dunes and beaches.	Endangered
12.2.7	*Melaleuca quinquenervia* open-forest to woodland. Occurs on Quaternary coastal dunes and seasonally waterlogged sand plains usually fringing drainage system behind beach ridge plains or on old dunes, swales and sandy coastal creek levees.	Of concern
12.2.11	Woodland to open-forest species include *Corymbia tessellaris*, *Eucalyptus tereticornis*, *Callitris columellaris*, *Petalostigma pubescens*, *Corymbia intermedia* or *C. clarksoniana*, *E. exserta*, *Livistona decipiens*, *Planchonia careya*, *Leptospermum neglectum*, *Acacia julifera*. *Melaleuca dealbata* and *Eucalyptus tereticornis* in swales. Occurs on Quaternary coastal beach ridges and swales.	Not of concern
12.2.14	Strand and fore dune complex comprising *Spinifex sericeus* grassland *Allocasuarina equisetifolia* woodland/open-forest. Occurs mostly on frontal dunes and beaches but can occur on exposed parts of dunes further inland.	Not of concern
12.2.11/14	as for 12.2.11 and 12.2.14 above	Not of concern
12.3.3	*Eucalyptus tereticornis* open-forest to woodland. Occurs on broad Quaternary alluvial plains where rainfall is usually less than 1000mm/y.	Endangered

Regional Ecosystem	Description	Conservation Status
12.3.10	*Eucalyptus populnea* ± *E. tereticornis* grassy woodland/tall woodland ± patches of *Acacia harpophylla* and *Melaleuca bracteata*. Occurs on Quaternary alluvial plains.	Endangered
12.12.7	*Eucalyptus crebra* grassy woodland. Occurs on Mesozoic to Proterozoic igneous rocks.	Not of concern
12.12.8	*Eucalyptus melanophloia*, usually with *E. crebra* ± *Corymbia erythrophloia* grassy woodland. Occurs on Mesozoic to Proterozoic igneous rocks.	Of concern
12.12.12	*Eucalyptus tereticornis*, *E. crebra* (sometimes *E. siderophloia*) woodland. Occurs on Mesozoic to Proterozoic igneous rocks, especially granite lowlands and basins.	Of concern
12.12.28	*Eucalyptus moluccana* ± *E. crebra*, *Corymbia citriodora* open-forest or woodland. Occurs on broad ridges and lower slopes on Mesozoic to Proterozoic igneous rocks.	Of concern

E3.2 Fauna

As expected, the range and diversity of bird species on Hummock Hill Island is similar to that found on nearby island and mainland coastal locations. The southern end of Hummock Hill is a significant high tide roosting site for migratory waders.

Ground dwelling fauna is scarcer and less diverse, reflecting the fact that Hummock Hill Island is cut off from the mainland at all but the lowest tides, when waters in Boyne Channel may be shallow enough for larger animals to traverse. Mammals include the Eastern Grey Kangaroo, several gliders, flying fox, bats and introduced rodents.

Scratches on trees observed in February 2005 were likely to be from goanna and small arboreal mammals.

Reptiles appear to be relatively uncommon.

Midges and mosquitoes are associated with coastal wetlands, particularly on the southern side of the island.

Dogs, horses and cattle were introduced to Hummock Hill Island during its use for grazing, however these have not been observed recently. Rats, house mice and cane toads have also been introduced to Hummock Hill Island.

Table 9 shows a summary of mammals and reptiles identified in previous surveys on Hummock Hill Island.

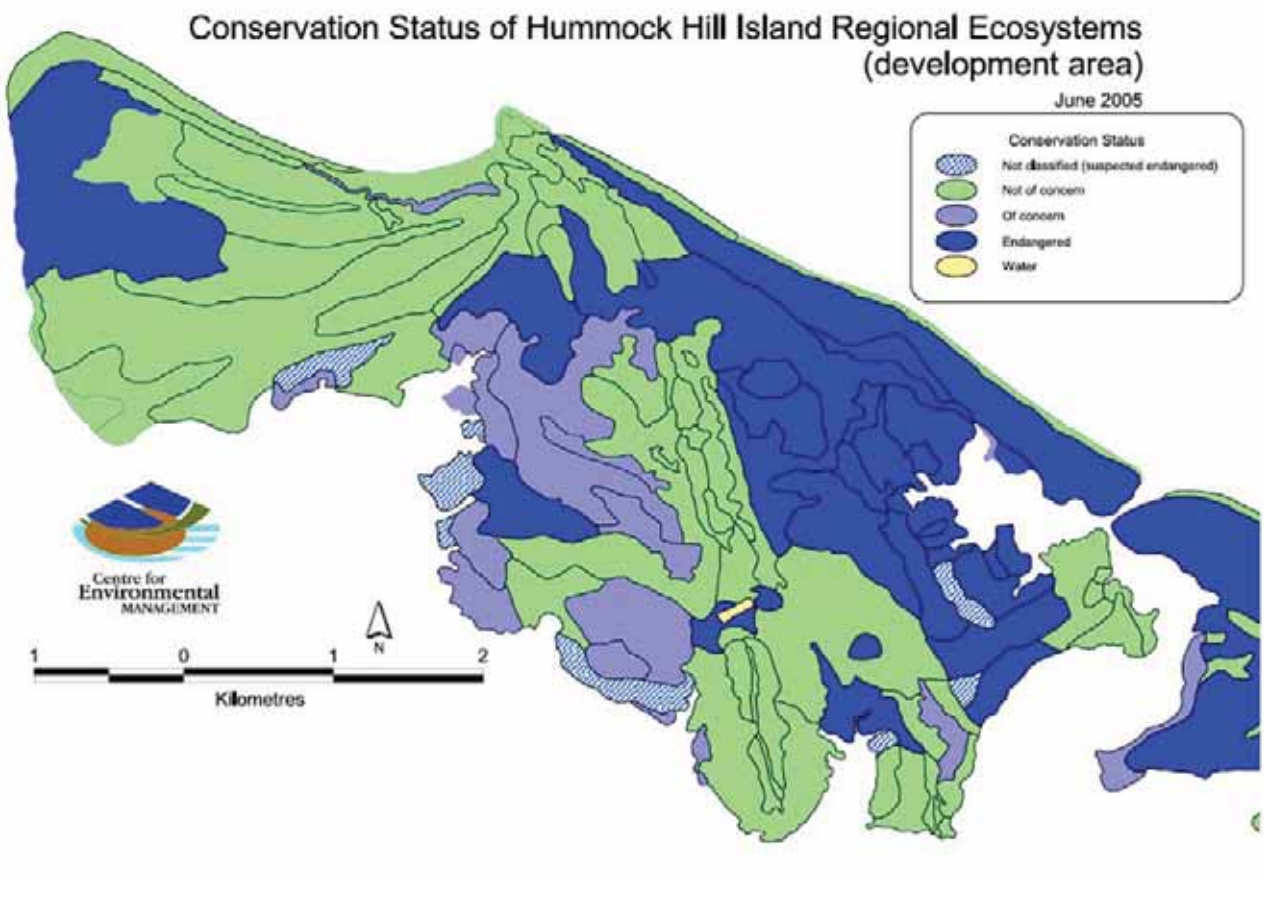

Figure 14: Conservation Status of Regional Ecosystems

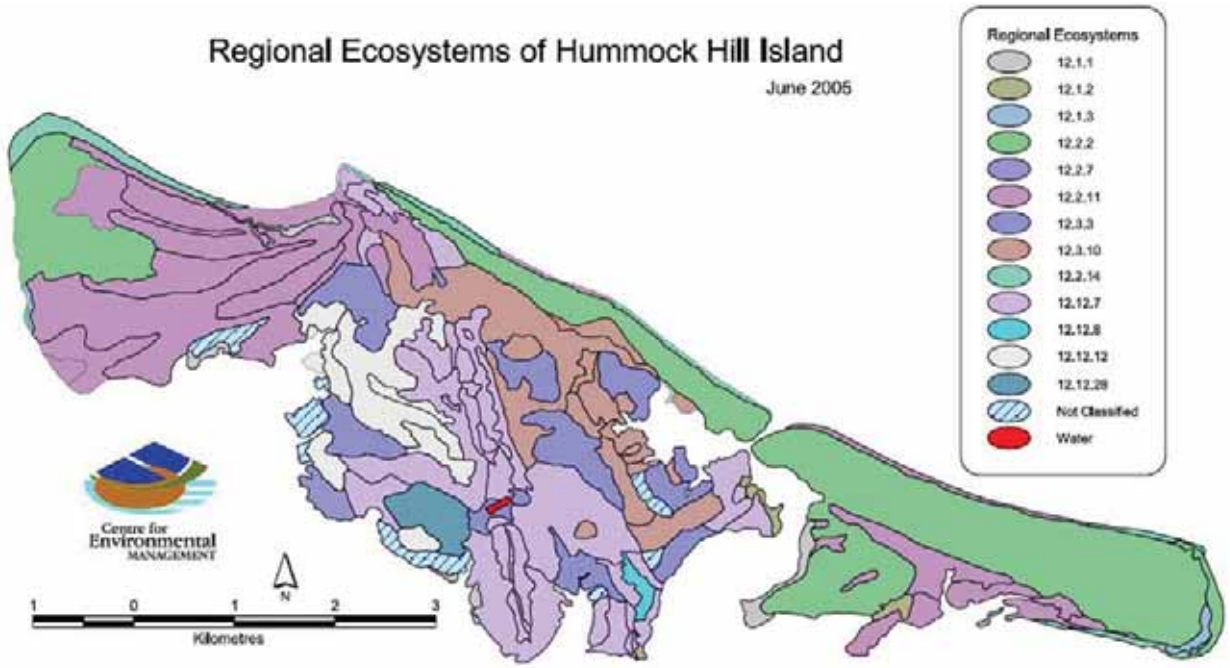

Figure 16: Regional Ecosystems of Hummock Hill Island

Table 9 Mammals and Reptiles Identified on Hummock Hill Island

Scientific Name	Comments	Common Name	Habitat
Tachyglossus aculeatus	Observed	Echidna	Eucalypt/grassland
Isoudon macrourus	Expected (1)	Northern Brown Bandicoot	Eucalypt/grassland
Petaurus norfolcensis	Observed	Squirrel Glider	Eucalypt/grassland
P. breviceps	Observed	Sugar Glider	Eucalypt/grassland
Trichosucus vulpecula	Expected	Common Bushtail Possum	Eucalypt/grassland
Macropus giganteus	Observed	Eastern Grey Kangaroo	Eucalypt/grassland
Wallabia bicolour	Expected	Swamp Wallaby	Eucalypt/grassland/paperbark swamp
Nystimene robinsonii	Observed	Queensland Tube-nosed Bat	Littoral vine scrub
Pteropus scapulatus	Tentative identification	Little Red Flying Flox	Eucalypt/grassland
Rattus fuscipes	Observed	Bush Rat	Disturbed land
Mus musculus	Introduced	House Mouse	Eucalypt/grassland
Canis familiaris	Introduced	Dog	
Equus caballus	Introduced	Horse	
Bos indicus	Introduced	Cattle	
Bufo marinus	Introduced	Cane Toad	
	Observed	Gecko	
Amphiboluris barbatus	Observed	Bearded Dragon	Eucalypt/grassland
Varanus goldii	Observed	Sand Monitor	Littoral vine scrub
Ctenotus robustus			
		Fence skink	Eucalypt/grassland
Dendrelaphus punctulatus	Observed	Common tree snake	Eucalypt/grassland
Pseudechis porphyriacus	Observed	Red Bellied Black Snake	Eucalypt/grassland

(1) expected based on a 1989 survey of Curtis Island (Kershaw 1989 in AGC Woodward Clyde 1993)

E3.3 Species of Conservation Significance

Two bird species have been observed on Hummock Hill Island that are listed under the Queensland Nature Conservation Act 1993:

- Eastern Curlew *Numenius madagascarensis*, listed as rare
- Beach Stone Curlew *Burhinus neglectus/Esacus neglectus*, listed as vulnerable.

Both of these are migratory wader birds which frequent estuarine and beach habitat, typically foraging in intertidal areas.

Table 10 shows species listed under the *Environmental Protection and Biodiversity Conservation Act 1999* that have been observed on Hummock Hill Island. All of these birds are fairly common in Eastern Australia, with many common across Australia. All have been observed in urban and non-urban habitats throughout their range (Birds Australia Atlas and Birdata). Birds Australia Atlas shows sightings of all of these birds in Gladstone, Tannum Sands/Boyne Island and Seventeen Seventy. All except the Southern Boobook are coastal birds.

Table 10 EPBC Listed Species Identified on Hummock Hill Island

Species name	Common Name	EPBC Status
Haliaeetus leucogaster	White-bellied Sea-Eagle	Migratory, Listed marine species
Hirundapus caudacatus	White-throated Needletail, Spine-tailed Swift	Migratory, Listed marine species
Merops ornatus	Rainbow Bee-eater	Listed marine species – overfly marine area
Calidris acuminata	Sharp-tailed sandpiper	Migratory
Charadrius mongolus	Mongolian Plover or Lesser Sand Plover	Migratory
Ninox novaeseelandiae	Southern Boobook	Migratory
Pandian haliaetus	Osprey	Migratory
Tringa hypoleucos	Common Sandpiper	Migratory

E4 Coastal and Aquatic Ecosystem

E4.1 Habitat

An extensive intertidal zone extends along the southern, eastern and western coastlines of Hummock Hill Island to the mainland coast. With the exception of the exclusion zone around the Boyne Channel causeway, this entire area is included in the Colosseum Inlet Fish Habitat Area. The area is also listed in the Directory of Important

Wetlands although it is not a Ramsar wetland. Hummock Hill Island lies entirely within the Rodds Bay Dugong Protected Area.

Coastal and marine habitats surrounding Hummock Hill Island are broadly described as follows:

- Intertidal mangrove and salt pan along the southern and southeastern coastlines of Hummock Hill Island as well as along much of the mainland coast. A mangrove lined tidal inlet effectively divides Hummock Hill Island into an eastern and western portion.
- Some areas of intertidal mudflats as well as extensive subtidal mudflats in the between the southern and south eastern coast of Hummock Hill Island and the mainland.
- A narrow sandy channel with depths up to 20 m along the western edge of the island between Hummock Hill Island and Wild Cattle Island.
- Sandy beaches and subtidal areas along the northern (exposed) side of Hummock Hill Island with a rocky headland at Tiber Point.
- Some offshore rocky reef north of Hummock Hill Island.
- Seagrasses have not been observed in close proximity to Hummock Hill Island, including in the subtidal muddy substrate Boyne Channel area. Seagrasses are reported further south of Pig Island and also north/north east of Hummock Hill Island. The potential for seasonal and annual fluctuation in seagrass cover is acknowledged.
- There are no coral reef communities in the immediate vicinity of Hummock Hill Island although coral reefs do occur to the southeast near Rodd's Peninsula.

E4.2 Species

Hummock Hill Island is not known as a turtle-nesting site but turtles are expected to occur in the immediate area and the northern beaches on the island are similar to other beaches in the region turtles are known to nest.

Although Hummock Hill Island is located within Rodds Bay Dugong Protection Area there is minimal seagrass habitat in the immediate vicinity. Dugongs have not been observed in the vicinity of Hummock Hill Island, however a comprehensive survey has not been carried out.

Sea birds, including waders, herons, cormorants and oyster catchers are expected to be common users of the shallow marine areas. Migratory waders such as the Easter Curlew and Godwits have been observed in small numbers on the tidal flats of the island.

E5 Geology and Soils

E5.1 Geology

Hummock Hill Island comprises part of the northeasterly margin of the Miriam Vale granodiorite, which is a large granitic batholith from the Permium-Triassic period. The Shoalwater Formation also outcrops on Hummock Hill Island, and comprises quartz arenite, mudstone, quartz-muscovite-biotite schist and gneiss.

The unit gives rise to shallow acid yellow-mottled duplex soils.

Holocene beach ridges less than 6000 years old are also found on Hummock Hill Island and are characterised by low relief and are separated by inter-ridge depressions. The sediment consists of fine-grained quartz sand, coarse sand at depth and minor organic rich silt with disseminated heavy mineral sands.

The Department of Natural Resources and Mines identifies the mineral sands resource as being “small”, consisting of between 5,000 and 5,000,000 tonnes.

E5.2 Soils

The following broad soil units were identified on the island in a 1993 study (Raymag) and confirmed in field work undertaken in September/October 2005:

- Lithosols on the steeper slopes and crest of the main range and some outcrops at lower elevations. These soils typically support an Eucalypt open woodland dominated by narrow leafed Ironbark and Pink Bloodwood and a grassy understorey;
- Solodics on the undulating plains below the main range. These soils typically support Eucalypt Open Woodland;
- Red earth, on a small area east of the headland on the north shore. These soils generally support dense grassland with mixed regrowth of Moreton Bay Ash, Acacias and Bloodwoods;
- Siliceous sands in the dune areas. These sands support a littoral vine scrub and Eucalypt and Melaleuca woodland; and
- Marine sediments in intertidal areas.

Acid sulphate soils may occur in low-lying areas, particularly on the southern side of the island, for example in the vicinity of the existing causeway/proposed bride. Typically, acid sulfate soils are present in areas of holocene sediments below 5m AHD, however they may occur at higher elevations as well.

Significant soil contamination is not expected to have occurred on the island based on the type of activities carried out in the past. A cattle dip is located on the ocean side of the island, near the former homestead. The area does not appear to have been decommissioned or decontaminated. Recent testing (November 2005) shows that contaminant levels are quite low.

Several empty drums were also observed in the vicinity of the homestead but have probably not lead to significant contamination as the quantities appear to be low. The

site is not included on the Contaminated Land Register or the Environmental Management Register as held by the Queensland EPA.

E5.3 Good Quality Agricultural Land

An assessment of the agricultural suitability of soils was undertaken as part of the Hummock Hill Island – Residential and Recreational Development Impact Assessment Study (1993). The assessment used classifications that have since been replaced by the State Planning Policy 1/92 Development and the Conservation of Agricultural Land. The study determined that the site contained the following pastoral suitability divisions:

- Main Range Landform – Class VII having severe limitation of slope erosion potential and soil depth.
- Undulating Plains – Class VI has impeded subsoil drainage and high salinity. There is a small areas of red soils (Class III) with moderate limitations for agricultural cultivation due to issues such as salt spray and available moisture.
- Dunal landform – Class VI due to limitations of moisture, low soil fertility, flooding and wetness.

The island has been used primarily for cattle grazing under a pastoral lease with very limited lucerne cultivation in the early years of European settlement. The site is currently not in use.

E6 Topography and Landform

Four distinct topographical units have been identified on Hummock Hill Island.

- The Main Range unit consists of a line of low rocky hills, which run approximately north-south across the centre of the island. Hummock Hill is the highest point, with an elevation of 135 m AHD. The slopes of the foothills are steep and concave, and decrease rapidly in slope with distance from the main range, where they merge into the adjacent plains. Rock outcrops or occurs at shallow depth or as scree with an increasing depth of weathering further downslope in this area. Gully erosion in the Gum Topped Box and Poplar Box Open Forest has occurred.
- Undulating Plains overlie granodiorite bedrock at the base of the Main Range unit. These areas are well drained with decomposed rock near the surface. The Undulating Plains merge into the dunes and intertidal areas.
- Tidal areas comprising mangrove and mudflats.
- Dunal area extends from the undulating plains to the west, north and east coasts of the island, merging into coastal beaches. The frontal dune system is stabilised by coastal vegetation such as sand Spinifex and dune couch.

E7 Visual Amenity

Hummock Hill Island presents a blend of natural scenery and rural (pastoral) scenery. It is largely undeveloped and is part of a larger setting that is renowned for its natural beauty. It lies at the southern end of the Great Barrier Reef World Heritage Area. Aesthetic characteristics are one of the values for which the GBRWHA has been designated.

Sensitive receptors with respect to development on the Island are limited. The island is visible to boat traffic, however close up views are likely to be at least partly screened by vegetation. Views from the mainland are restricted both by topography and lack of public access to the mainland coastline.

Hummock Hill Island is just south of the Boyne Island aluminium smelter, Port of Gladstone and Gladstone industrial area and development associated with these areas is visible from the northern shore of Hummock Hill Island. Views of this area are characterised by large industrial buildings and structures, including chimneys. The shipping lane runs parallel to the coast and at any one time, several large ships are visible from Hummock Hill Island.

E8 Cultural Heritage

An archaeological survey undertaken in 1993 by A.G.C. Woodward Clyde, which identified shell middens and artefact scatters near the causeway on the southern side of the island. A sparse scatter of stone and shell in a dune area on the northern side of the island is also likely to have been a midden. In addition, a stone cairn of unknown origin exists on top of Hummock Hill and has been recorded as a possible Aboriginal stone arrangement.

There are no heritage listed sites on Hummock Hill Island however several sites that may be of European heritage interest exist relating to earlier use of the island for grazing activities.

A walk over survey of the site was conducted by an archaeologist in December 2005 which confirmed the location of these sites and identified some additional sites, including sites of potential European heritage.

E9 Noise and Air Quality

Hummock Hill Island is currently vacant land and there are no significant sources of noise or air pollution on the island or in close proximity.

Industrial activities in Gladstone generate a range of air pollutants, most notably particulate matter, nitrogen oxides and sulfur dioxide. The EPA undertake air quality monitoring at three sites within the Gladstone region to determine the existing air quality and to monitor trends in air quality. The current ambient levels of all major pollutants are generally well below the guidelines. Prevailing winds at Hummock Hill Island are generally towards Gladstone, thus blowing plumes away from the island. In any case, the concentrations of pollutants in the airshed remain relatively low and would disperse prior to a plume reaching Hummock Hill Island.

There are few sensitive noise receptors in the vicinity of the island. Some fishing shacks exist on Wild Cattle Island and the mainland shore of Colosseum Inlet to the east of Hummock Hill Island.

E10 Climate and Natural Hazards

E10.1 Climate

The Gladstone region has a subtropical climate. Summers are wet and hot with average maximum temperatures around 30^{o}C while winters are drier and cooler, with average maximum temperatures around 15-20^{o}C.

Winds in Gladstone are generally from the East and South quarters. Winds tend to shift easterly and strengthen in the afternoon, showing the influence of a sea breeze.

E10.2 Natural Hazards

Cyclonic activity in the region of the Project occurs predominantly between January and March, although the cyclone season encompasses all months between November to April inclusive. The main implications of cyclones are:

- Severe wind velocities. The highest wind velocity recorded at Gladstone is 155 km/hr and at Bustard Head ;
- Extreme rainfall events. The highest daily rainfall recorded at Gladstone is 229 mm and at Bustard Head is 379 mm; and
- Increased tidal effects (storm surge).

Severe flooding is not likely to be a concern on Hummock Hill Island due to the size of catchments on the island. Storm surge has been estimated to be 3.3 to 3.6 m AHD (100 year average recurrence) (Coastal Engineering Solutions October 2005).

The Curtis Coast is noted to have relatively high seismic activity with over 400 earthquakes having been recorded in the Gladstone region. There is currently only one seismograph is located near Gladstone at Awoonga dam.

E11 Social and Economic Environment

E11.1 Demographic Characteristics

Hummock Hill Island is located within the shire of Miriam Vale and is surrounded by the shires of Calliope, Burnett and Kolan. The collective population of these shires was 53,419 in 2001. The Department of Local Government and Planning has projected the growth rate for the area to be 2.4% from 2001 to 2026, compared with 1.5% for the state. The projected population in 2026 is 97,550. The highest growth rate for age groups is in the 65+ group, with a projected growth of 5.7% between 2001 to 2026 for this age group compared with 3.7% for the state.

Hummock Hill Island is situated in the Wide Bay-Burnett Statistical division. This region comprises 22 local government areas, including Miriam Vale Shire and has an estimated population at 30 June 2004 of 244,537 persons. This represents 6.4 per cent of the total Queensland population.

The Wide Bay-Burnett Statistical Division recorded a population growth rate of 1.9% between June 2002 and June 2003, with the fastest growing local government area in the 12 months to June 2003 being Hervey Bay City (5.0%), followed by Miriam Vale

Shire (4.1%). Note however that for Miriam Vale Shire, the actual increase in population in this period was 197 people. The 2004 population of Miriam Vale Shire is estimated at 5,113 persons and is predicted to grow to about 10,000 people in 2026 (OESR).

Population growth rates are shown in Table 11.

Table 11 Population Growth

Location	Estimated Population	Average Annual Growth Rate	
	2004	1998-2003	2002-2003
Miriam Vale SC	5,113	2.9%	4.1% (197 persons)
Calliope SC	16,210	2.0%	2.5% (400 persons)
Gladstone CC	28,503	0.8%	1.7% (492 persons)
Queensland	-	1.9%	2.3%

Table 12 shows age distribution in Miriam Vale and Queensland based on the 2001 census and medium series estimates for 2026. The 15-24 age group in Miriam Vale is significantly lower than the State average, possibly reflecting the lack of tertiary education and training opportunities in Miriam Vale. The forecast is for a significant increase in the 65+ age group, even compared to the State average, by 2026. This may be based on perceived desirability of coastal locations in Miriam Vale for retirement housing.

Table 12 Age Distribution [1]

	0-14	15-24	25-44	45-64	65+	Median Age
Miriam Vale 2001	21.7%	8.6%	26.7%	33.6%	9.4%	41
Queensland 2001	21.3%	14.1%	29.8%	23.2%	11.6%	35
Miriam Vale 2026 [2]	11.8%	5.7%	17.8%	31.2%	33.5%	56
Queensland 2026 [2]	16.4%	12.0%	26.1%	25.5%	20.0%	42

Population Information and Forecasting Unit, DLGP

Based on medium growth series

The above average population growth in Miriam Vale and Calliope Shires probably reflects increased employment opportunities in the Gladstone region, with migrants into the region living in adjacent shires of Calliope and Miriam Vale. Some growth in Miriam Vale is probably also attributable to increased activity at the coastal towns of Agnes Water and 1770, and this may also explain the higher than normal median age if retirees are moving to coastal locations.

E11.2 Socio-economic Characteristics

Hummock Hill Island lies within Miriam Vale Shire Council and the closest urban centres are Miriam Vale and Bororen. The closest city to Hummock Hill Island is Gladstone, about 60 km by road from Hummock Hill Island Tannum Sands/Boyne Island, in Calliope Shire also represents a significant population, employment and activity centre in close proximity to Hummock Hill Island.

The median weekly income for Gladstone is higher than the median income for the state, however the median weekly income for the Miriam Vale shire is well below that of Queensland.

Businesses in the agriculture, forestry and farming industry make up 61.1% of total businesses by industry in the Central Queensland shires of Miriam Vale, Calliope, Burnett and Fitzroy, this is compared with 17.2% average for the state. The three highest employing industries are agriculture, forestry and fishing and retail trade and manufacturing which employ 13.8%, 14% and 14.1% respectively. The majority of workers in the region are trade persons and related workers. According to the 2001 Census the shires had an unemployment rate of 9.7%, which was higher than the state average of 8.2%.

Gladstone has a broad industrial base and a special development area in Calliope Shire has been identified by the Queensland Government to facilitate industrial development in the area. Port of Gladstone is one of the State's largest ports and is one of the world's largest coal export ports with coal brought to Gladstone by rail from mines inland.

Tourism is also a major component of the regional economy. Tourists can access the Great Barrier Reef from Gladstone and other townships in the region. The coastal areas of Miriam Vale also offer beaches and other tourist attractions, currently centred on Agnes Waters and 1770. The majority of tourists visiting the region come from either Brisbane or country areas within Queensland. The most popular form of transport used by visitors to the region is a private vehicle, with the second highest form of transport to the region being by air.

An increasing market for coastal recreational facilities is developing among the inland mining communities of central Queensland. The current upswing in mining activity has resulted in increased employment and increased remuneration in these mining communities.

E12 Infrastructure and Services

E12.1 Transport and Traffic

The Bruce Highway provides the main north-south access route through the Gladstone Region. The Dawson Highway links Gladstone with the central and west regions.

Access to Hummock Hill Island is from Turkey Beach Road, Foreshores Road, and Clarks Drive.

The road network on the island consists of unformed trackswith a rock ford connection to the mainland accessible only at very low tides.

The North Coast Rail Line links Gladstone with Brisbane and Cairns. Stations are at Miriam Vale and Gladstone.

Gladstone has an airport and is also one of Queensland's major sea ports.

E12.2 Power and Telecommunications

While power and telecommunications were provided to the homestead at Tiber Point, these services are probably obsolete, and in any case, would be inadequate to supply the proposed development population.

The nearest major electrical substation is at Boyne. There are high voltage powerlines passing within about 10 km of the site.

E12.3 Water and Wastewater

There is no water supply from the mainland to Hummock Hill Island and fresh surface water supplies on the island are minimal. Awoonga Dam is located about 30 km inland from the island and provides water for industrial uses at Gladstone as well as domestic use in Gladstone City, Calliope Shire and parts of Miriam Vale Shire. Calliope Shire Council has a reservoir at Tannum Sands that has capacity to supply the proposed population at Hummock Hill Island.

The island is not serviced by reticulated sewerage. The only reticulated sewerage system currently in operation in Miriam Vale Shire Council as at Agnes Waters.

E12.4 Waste Management

Miriam Vale Shire operates 3 waste management sites located at 1770, Bororen, and Baffle Creek. Charges apply for the disposal of Building/Commercial/Industrial refuse at these sites. A new regional landfill is proposed to be located in Calliope Shire which will service surrounding shires including Miriam Vale.

Hummock Hill Island is currently outside of the area serviced by household waste collection.

E13 Local and Regional Access

E13.1 Road Access

Hummock Hill Island is located off the coast of Queensland approximately 60km southeast of Gladstone by road.

Vehicular access to the island is achieved from the Bruce Hwy via the Turkey Beach Road turnoff, Foreshores Road and Clarks Road where there is a causeway to the island that allow access at low tide. Turkey Beach Road and parts of Foreshores Road are two lane bitumen roads. The remainder of Foreshores Road is a two lane unsealed road. Clarks Road is a one lane unsealed track in moderate to poor condition. Widening and upgrading of this road can be carried out within the existing road reserve.

Road base material and sand is available from existing quarries within the Gladstone/Calliope region.

Intersections at the Bruce Highway/Turkey Beach Road, Turkey Beach Road/Foreshores Road and Foreshores Road/Clark Road would require upgrading as would the rail crossing immediately after the turn off from Bruce Highway to Turkey Beach Road. The rail crossing is likely to remain at grade but may need improved sight distances and warning signals.

E13.2 Air Access

The nearest air link to the island is Gladstone (60km). Qantas operates 6 flights daily between Gladstone and Brisbane with a travel time of 80 minutes. One of these flights links with points further north.

There is an existing grassed airstrip on the island which is in poor repair and would need to be cleared and regraded to become operational.

E13.3 Rail

The nearest rail link is Miriam Vale Train Station (42km from Hummock Hill Island). Tilt trains run between Brisbane and Miriam Vale 6 times per week. Approximate travel time from Brisbane is 6 hours.

E13.4 Sea

Hummock Hill Island can be accessed by boat from Gladstone and a number of minor boat launching points along the mainland coast. There are no formal boat landing locations on the Island, however small boats may make safe landing at the causeway in all weather and also on the northern beaches and Colosseum inlet coast when weather permits.

The nearest boat launching ramps are at Tannum Sands and Turkey Beach while small boats may also be launched at Foreshores and Wild Cattle Creek on high tides.

Appendix F

Assessment of Potential Impacts on Great Barrier Reef World Heritage Area Values

Assessment of Potential Effects on World Heritage Values of the Great Barrier Reef World Heritage Area

Criteria	Values	Response
N(I) Outstanding examples of stages of earth's history	The Great Barrier Reef is by far the largest single collection of coral reefs in the world. The World Heritage values of the property include: • 2904 coral reefs covering approximately 20,055km^2; • 300 coral cays and 600 continental islands; • reef morphologies reflecting historical and on-going geomorphic and oceanographic processes; • processes of geological evolution linking islands, cays, reefs and changing sea levels, together with sand barriers, deltaic and associated sand dunes; • record of sea level changes and the complete history of the reef's evolution are recorded in the reef structure; • record of climate history, environmental conditions and processes extending back over several hundred years within old massive corals; • formations such as serpentine rocks of South Percy island, intact and active dune systems, undisturbed tidal sediments and "blue holes"; and • record of sea level changes reflected in distribution of continental island flora and fauna.	The proposed Hummock Hill Island development will not affect the geological and scientific information and examples for which the GBR WHA was prescribed. The geological formation of Hummock Hill Island will not be affected by the proposed development. Other geological features will not be directly or indirectly affected by the proposed development. Coral reef structures and ecosystems will not be affected directly or indirectly. The presence and distribution of flora and fauna on Hummock Hill Island will not be significantly altered. Data and studies undertaken for the proposed development will provide additional information on the distribution and characteristics of ecosystems and species on Hummock Hill Island.
N(II) Outstanding examples of on-going evolution	Biologically the Great Barrier Reef supports the most diverse ecosystem known to [hu]man[s] and its enormous diversity is thought to reflect the maturity of an ecosystem, which has evolved over millions of years on the northeast Continental Shelf of Australia. The World Heritage values include: • the heterogeneity and interconnectivity of the reef assemblage; • size and morphological diversity (elevation ranging from the sea bed to 1142m at Mt. Bowen and a large cross-shelf extent encompass the fullest possible representation of marine environmental processes); • on going processes of accretion and erosion of coral reefs, sand banks and coral cays, erosion and deposition processes along the coastline, river deltas and estuaries and continental islands;	The proposed development on Hummock Hill Island will be designed, constructed and managed to ensure that there are no adverse impacts on coastal and aquatic ecosystems or on the geological and geomorphological characteristics of the region that underlie the ecological diversity of the Great Barrier Reef. Coastal and estuarine processes that shape these habitats will not be affected by the proposed development. Detailed investigations into management of stormwater, wastewater, waste, human access and activities, domestic pets, weeds and other potential impacts on

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	• extensive Halimeda beds representing active calcification and sediment accretion for over 10 000 years;
	• evidence of the dispersion and evolution of hard corals and associated flora and fauna from the "Indo-West Pacific centre of diversity" along the north-south extent of the reef;
	• inter-connections with the Wet Tropics via the coastal interface and Lord Howe Island via the East Australia current;
	• indigenous temperate species derived from tropical species;
	• living coral colonies (including some of the world's oldest);
	• inshore coral communities of southern reefs;
	• five floristic regions identified for continental islands and two for coral cays;
	• the diversity of flora and fauna, including:
	  • Macroalgae (estimated 400-500 species);
	  Porifera (estimated 1500 species, some endemic, mostly undescribed);
	  Cnidaria: Corals - part of the global centre of coral diversity and including:
	  • hexacorals (70 genera and 350 species, including 10 endemic species);
	  • octocorals (80 genera, number of species not yet estimated);
	  • Tunicata: Ascidians (at least 330 species);
	  • Bryozoa (an estimated 300-500 species, many undescribed);
	  • Crustacea (at least 1330 species from 3 subclasses);
	  • Worms:
	  • Polychaetes (estimated 500 species);
	  • Platyhelminthes: include free-living Tubelleria (number of species not yet estimated), polyclad Tubelleria (up to 300 species) and parasitic helminthes (estimated 1000's of species, most undescribed);
		coastal and aquatic habitats will be undertaken as part of the impact assessment for the proposed development. The outcome of these investigations will be specific proposals and management measures to be put in place to ensure that all potential indirect impacts on areas outside the development footprint can be avoided and managed.
		
		The value of the reef and its diverse habitats and ecosystems as an example of evolutionary processes or species evolution will not be diminished. The wide range of species that exist in the habitats offered by the reef ecosystem will not be diminished.
		
		The proposed development will almost entirely take place within terrestrial zones of the WHA, the only exceptions being the proposed bridge and boat ramps which will affect about 200m of coastline in total. Clearing of about one third of terrestrial ecosystems within the development lease will be required to allow the proposed development to go ahead. Clearing is being limited to terrestrial ecosystems classified by the Queensland State Government as “not of concern”. A significant proportion of not of concern vegetation will also be retained within the development. Flora and fauna surveys of the Development Lease have not indicated a high proportion of listed rare and threatened species, nor any particularly unusual assemblages of species.
		
		Nearby terrestrial islands (Wild Cattle Island) and coastal

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	• Phytoplankton (a diverse group existing in two broad communities);
	• Mollusca (between 5000-8000 species);
	• Echinodermata (estimated 800 extant species, including many rare taxa and type specimens);
	• fishes (between 1200 and 2000 species from 130 families, with high species diversity and heterogeneity; includes the Whale Shark *Rhynchodon typus*);
	• seabirds (between 1.4 and 1.7 million seabirds breeding on islands);
	• marine reptiles (including 6 sea turtle species, 17 sea snake species, and 1 species of crocodile);
	• marine mammals (including 1 species of dugong (*Dugong dugon*), and 26 species of whales and dolphins);
	• terrestrial flora: see "Habitats: Islands" and;
	• terrestrial fauna, including:
	  • invertebrates (pseudoscorpions, mites, ticks, spiders, centipedes, isopods, phalangids, millipedes, collembolans and 109 families of insects from 20 orders, and large over-wintering aggregations of butterflies); and
	  • vertebrates (including seabirds (see above), reptiles: crocodiles and turtles, 9 snakes and 31 lizards, mammals);
	• the integrity of the inter-connections between reef and island networks in terms of dispersion, recruitment, and the subsequent gene flow of many taxa;
	• processes of dispersal, colonisation and establishment of plant communities within the context of island biogeography (e.g. dispersal of seeds by air, sea and vectors such as birds are examples of dispersion, colonisation and succession);
	• the isolation of certain island populations (e.g. recent speciation evident in two subspecies of the butterfly *Tirumala hamata* and the evolution of
		mainland areas are protected as National Parks, providing protection for examples of terrestrial flora and fauna recognised in the World Heritage listing.
		
		While the northern beaches of Hummock Hill Island appear suitable for turtle breeding and egg laying, there is no evidence that turtles have used these beaches. In any case, the beaches themselves will not be directly impacted by the development, and techniques have been successfully used at other locations to ensure that public access to turtle breeding beaches does not affect breeding, egg laying and egg hatching components of the turtle life cycle.

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	distinct races of the bird *Zosterops spp);* • remnant vegetation types (hoop pines) and relic species (sponges) on islands. • evidence of morphological and genetic changes in mangrove and seagrass flora across regional scales; and • feeding and/or breeding grounds for international migratory seabirds, cetaceans and sea turtles.	
N(III) Contains superlative natural phenomena	The Great Barrier Reef provides some of the most spectacular scenery on earth and is of exceptional natural beauty. The World Heritage values include: • the vast extent of the reef and island systems which produces an unparalleled aerial vista; • islands ranging from towering forested continental islands complete with freshwater streams, to small coral cays with rainforest and unvegetated sand cays; • coastal and adjacent islands with mangrove systems of exceptional beauty; • the rich variety of landscapes and seascapes including rugged mountains with dense and diverse vegetation and adjacent fringing reefs; • the abundance and diversity of shape, size and colour of marine fauna and flora in the coral reefs; • spectacular breeding colonies of seabirds and great aggregations of over-wintering butterflies; and • migrating whales, dolphins, dugong, whale sharks, sea turtles, seabirds and concentrations of large fish.	The proposed development on Hummock Hill Island will be visible from the air. Hummock Hill Island is visible from a few locations on the mainland and also to boat traffic passing to seaward of the Island. However the island faces the main channel into the port of Gladstone and forms part of the general landscape that is dominated by large industrial structures of Gladstone and Boyne Island as well as large ships using Gladstone Port. Some aspects of the development will be visible in views within and to the world heritage area. The potential visual impacts of the proposed development on viewers from air, sea and land positions will require further assessment so that design measures can be put in place to ensure that views of the development do not detract from the overall landscape character in this part of the World Heritage Area. No other “superlative natural phenomena” are expected to be impacted by the proposed development on Hummock Hill Island.
N(IV) Important habitats for	The Great Barrier Reef contains many outstanding examples of important and significant natural habitats for *in situ* conservation of species of conservation	As discussed above, the proposed development will be designed and constructed to ensure that impacts are

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conservation of biological diversity	significance, particularly resulting from the latitudinal and cross-shelf completeness of the region.
	The World Heritage values include:
	• habitats for species of conservation significance within the 77 broadscale bioregional associations that have been identified for the property and which include:
	  • over 2900 coral reefs (covering 20 055km2) which are structurally and ecologically complex;
	  • large numbers of islands, including:
	  • 600 continental islands supporting 2195 plant species in 5 distinct floristic regions;
	  • 300 coral cays and sand cays;
	  • seabird and sea turtle rookeries, including breeding populations of green sea turtles and Hawksbill turtles; and
	  • coral cays with 300-350 plant species in 2 distinct floristic regions;
	  • ·seagrass beds (over 5000km2) comprising 15 species, 2 endemic;
	  • mangroves (over 2070km2) including 37 species;
	  • Halimeda banks in the northern region and the unique deep water bed in the central region; and large areas of ecologically complex inter-reefal and lagoonal benthos; and
	  • species of plants and animals of conservation significance
		contained within the development lease. Thus, coastal and aquatic ecosystems, and the individual species within these ecosystems are not expected to be directly or indirectly impacted by the proposed development.
		
		Detailed investigations into human settlement, infrastructure and services to be provided as part of the proposed development will identify the measures required to ensure that adverse impacts on coastal and aquatic ecosystems do not occur as a result of the proposed development.
		
		As discussed above, clearing of about Xxh of terrestrial vegetation will be required. This will not affect any of the identified bioregions of the WHA (Map of bioregions in the GBRWHA - <*http://www.gbrmpa.gov.au/corp_site/key_issues/conservation/rep_areas/documents/bioregions_2001_06.pdf*>)
		
		Hummock Hill Island lies wholly within Bioregion NA3 – High Nutrients Coastal Strip: Terrigenous Mud and high levels of nutrients from adjoining land. Seagrasses in sheltered sites only. Good turtle and dugong feeding habitat. Wet tropical influence for much of the coast [note that the wet tropics region does not extend as far south as Hummock Hill Island].

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