AQUIS

GREAT BARRIER REEF RESORT

INITIAL ADVICE STATEMENT

OI

Initial Advice Statement

Aquis Resort at The Great Barrier Reef

JULY 2013

CONTENTS

GLOSSARY, ACRONYMS AND ABBREVIATIONS

TERM	MEANING
AHD	Australian Height Datum
ARI	Average Recurrence Interval
ASS	Acid Sulfate Soil
ASS/PASS	Acid Sulfate Soil /Potential Acid Sulfate Soil
BOD	Biological Oxygen Demand
BOM	Bureau of Meteorology
COG	Coordinator General
CRC	Cairns Regional Council
DAFF	Department of Agriculture, Fisheries and Forestry
DEEDI	(former) Department of Employment Economic Development and Innovation (fisheries interests now under DAFF)
DERM	(former) Department of Environment and Resource Management (now spilt into NPRSR, EHP and NR&M)
DSDIP	Department of State Development and Infrastructure Planning
EHP	(Department of) Environment and Heritage Protection (formerly part of the former DERM)
EMP	Environmental Management Plan
EIS	Environmental Impact Statement
EP Act	*Environmental Protection Act 1994* (Qld)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cwlth)
ESA	Environmentally Sensitive Area (under the EP Act)
EVNT species	Endangered Vulnerable or Near Threatened plants and animals (under the NC Act)
FHA	Fish Habitat Area (protected under the *Fisheries Act 1994* (Qld))
FNQRP	Far North Queensland Regional Plan 2009-2031
GBR	Great Barrier Reef
GBRMP	Great Barrier Reef Marine Park
GBRWHA	Great Barrier Reef World Heritage Area
NC Act	*Nature Conservation Act 1992* (Qld)
IAS	Initial Advice Statement

TERM	MEANING
IDAS	Integrated Development Assessment System
HAT	Highest Astronomical Tide
LAT	Lowest Astronomical Tide
NES	(Matters of) National Environmental Significance under the EPBC Act
NPRSR	(Department of) National Parks, Recreation, Sport and Racing (formerly QPWS)
NR&M	(Department of) Natural Resources &Mines (formerly part of the former DERM)
QMP	Queensland Marine Park
SEWPaC	(Department of) Sustainability, Environment, Water, Population and Communities (Commonwealth)
SPA	*Sustainable Planning Act 2009*
SDPWO Act	*State Development and Public Works Organisation Act*
SQID	Stormwater quality improvement devices
STP	Sewerage Treatment Plant
ToR	Terms of Reference
VM Act	*Vegetation Management Act 1999* (Qld)
WSUD	Water Sensitive Urban Design
SDPWO Act	*State Development and Public Works Organisation Act 1971* (Qld)

1.0 INTRODUCTION

1.1 Background

Aquis Resort at The Great Barrier Reef is a large scale, complex project that requires several levels of government assessment and approval under a variety of legislation. It is a strategically significant project for Cairns, Far North Queensland and the state of Queensland in terms of it potential benefits to the economy and the flow on benefits to the community. It will be the largest Tourism development ever proposed in Queensland.

The Proponent, Aquis Resort at the Great Barrier Reef Pty Ltd is seeking declaration of the proposed Aquis Resort - Great Barrier Reef development at Yorkeys Knob, Cairns as a "coordinated project" under section 26(1) of the State Development and Public Works Organisation Act 1971 (Qld) (SDPWO Act)

This project is characterised by:

- complex approval requirements, including Local and State Government involvement;
- a high level of capital investment (construction investment $4.2billion);
- potential effects on infrastructure, the environment and social impact;
- provision of substantial employment opportunities (direct employment of 9300 full time jobs at construction peak and 10,000 full time equivalents in Operations); and
- Strategic significance to the locality, region and the state.

Aquis Resort at the Great Barrier Reef Pty Ltd considers that the project is of such substantial scale and of such significant regional and state importance that it (ipso facto) justifies a coordinated project declaration.

Key environmental objectives of the project are to ensure that:

- No environmental harm occurs
- Levels of environmental protection are consistent with relevant legislation, policy and guidelines
- Best practices are adopted in the design, construction and operation of the project
- A consistent and uniform management approach is undertaken to achieve the levels of environmental protection throughout the life of the development

Initial assessment of the proposed site reveals that there are a number of environmental effects that require detailed investigation through the approval process and the provision of significant infrastructure upgrades in the Cairns region in relation to general utilities and services as the scale of the development was not foreseen in the current planning for growth and expansion on the Northern Beaches.

This development presents a significant opportunity for Chinese investment in Australian tourism. Its regional economic stimulus will generate will provide jobs, housing, business and investment interest at a level not seen in Queensland since the 1990s.

1.2 Purpose and scope of the IAS

Given the size, economic value, location and environment within which this proposal is to be located the purpose of this Initial Advice Statement is to provide a high level of information to the government in order for each entity to assess their level of interest in the project, as stated under the *State Development and Public Works Organisation Act 1971* (SDPWO).

The Initial Advice Statement supports the proponent's application to the Coordinator-General seeking a declaration of the proposal as 'Coordinated Project' for which an EIS is required under the SDPWO Act. It will inform the preparation of the Terms of Reference for the EIS about the proposal.

The proponent acknowledges that obtaining the casino licence is not part of the EIS process and consequently is not be seeking evaluation of this component by the Coordinator-General.

2.0 THE PROPONENT

The proponent, Aquis Resort at The Great Barrier Reef Pty Ltd (AaGBR) is wholly and solely owned by Mr Tony Fung a Hong Kong resident but a long term investor in Queensland.

Tony Fung, 61, is a Hong Kong based private investment banker, financier and investor. He has more than 40 years experience in global financial services and investment, including more than 15 years as an active investor in Queensland. Mr Fung is a highly regarded businessman with a sound and long standing business and personal reputation in the Hong Kong business community.

Mr Fung is the second son of legendary Hong Kong banker and investor Fung King Hey, who founded Sun Hung Kai Securities, the then largest financial services company in Hong Kong and Sun Hung Kai Bank, the first Hong Kong bank to receive a full banking licence after the 1965 government moratorium on the granting of banking licences.

At one point in the mid-1980s the Fung family was the single largest shareholder in Merrill Lynch and controlled a number of companies listed on the Hong Kong stock exchange.

After the passing of his father in 1985, Tony took over the reins of the Group and managed it until it was sold in 1996. Sung Hung Kai Bank is known today as Fubon Bank (Hong Kong).

Following the sale of the Group Mr Fung established his own private investment business. Yu Ming Investments quickly became one of the most successful privately owned and run property investment companies in Hong Kong and remains one of the most respected businesses today.

Since 1996 the Mr Fung has invested heavily in the strongly performed Hong Kong commercial property market. His personal property portfolio also currently comprises shopping malls, serviced apartments and office buildings as well a significant land bank in China. He also has investments in other international locations including California.

Mr Fung has been a loyal and long-term investor in Australia, with his investments made exclusively in Queensland. He has owned homes and invested in Queensland since 1996.

He owns a number of residential properties on Queensland, including a home in the Noosa hinterland. Through privately-owned companies he also owns a cattle farm and separate wagyu breeding business in Innisfail, a sugar cane plantation on the Atherton Tableland and a cattle station near Mount Garnett in Central Queensland.

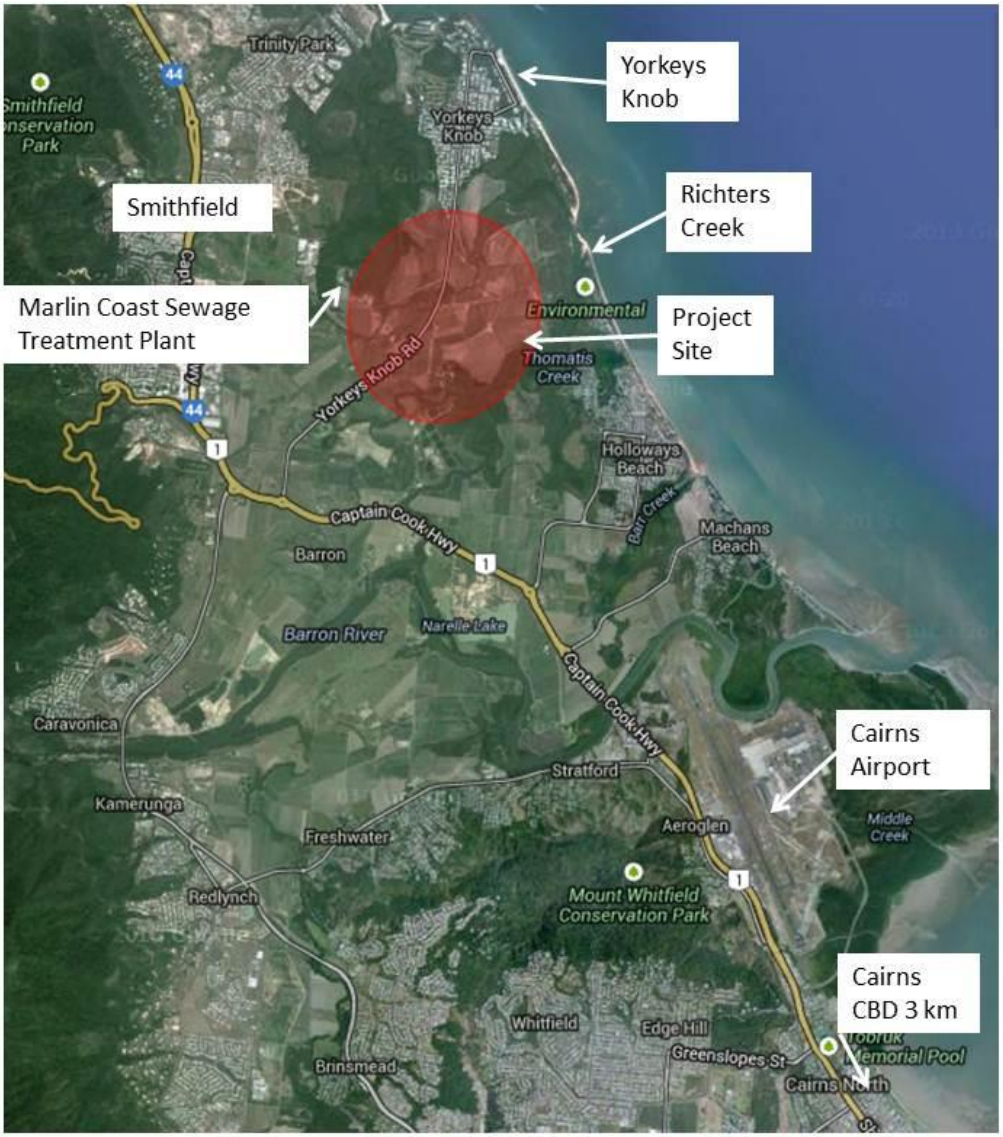
Mr Fung has every intention to continue investing and supporting the pastoral agricultural industries in Queensland in the future.

3.0 LOCATION OF THE PROPOSAL

3.1 Location

The development is proposed for a site which is located to the south of the residential community of Yorkeys Knob approximately 13 km north of the Cairns Central Business District and 6km north of Cairns International Airport as shown in Figure 1.

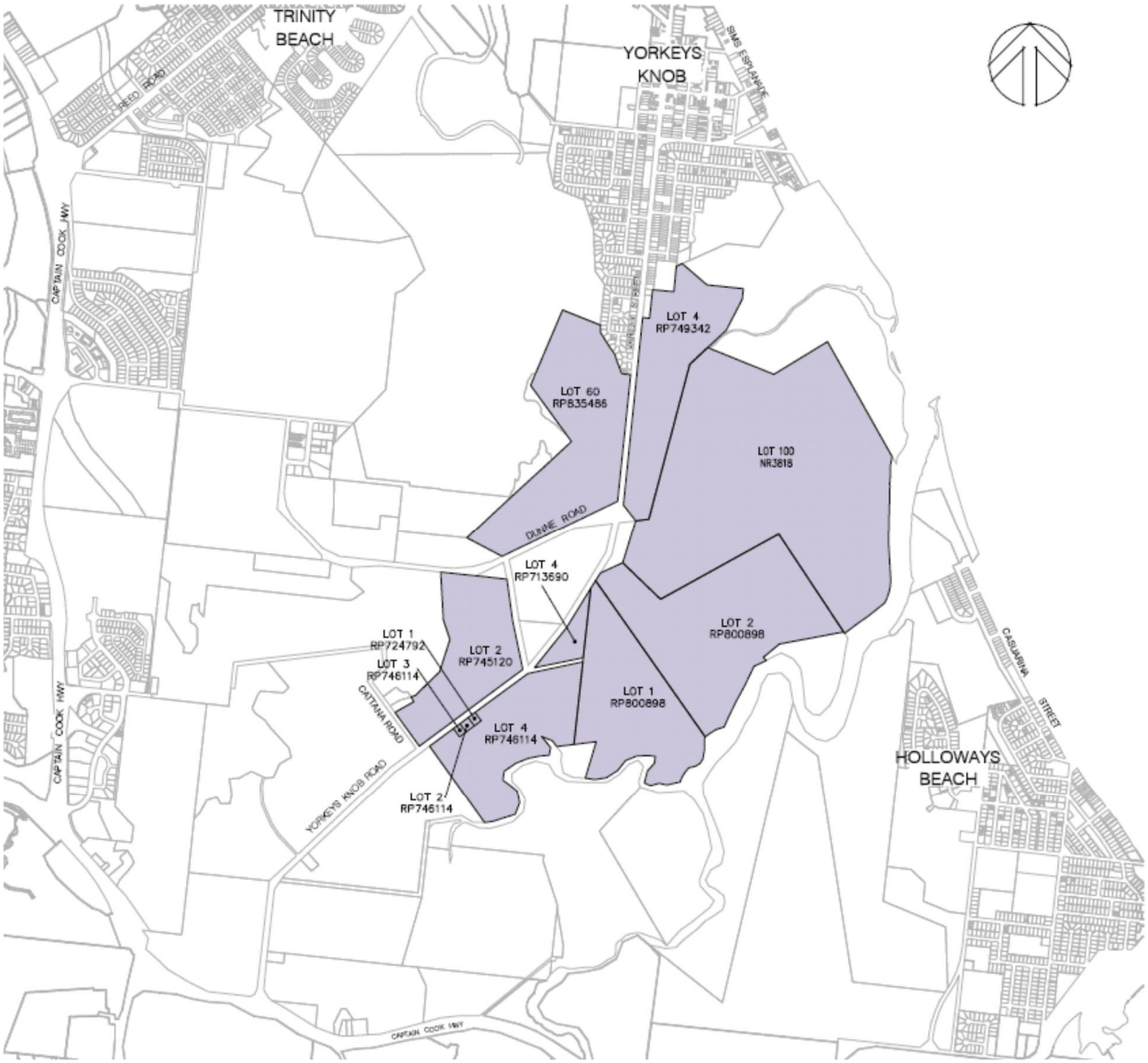
Figure 1: Locality Plan



The site consists of eleven (11) freehold titles, which are currently under option to purchase by the proponent

LOT AND PLAN DETAILS	AREA	OCCUPIER
Lot 100 on NR3818 Title Ref: 20983091	121.001ha	Vacant
Lot 1 on RP800898 Title Ref: 21449027	40.835ha	Vacant
Lot 2 on RP800898 Title Ref: 21449028	46.35ha	Register Proprietor
Lot 2 on RP745120 Title Ref: 21343157	26.7596ha	Vacant
Lot 60 on RP835486 Title Ref: 21027116	43.24ha	Vacant
Lot 4 on RP713690 Title Ref: 20503245	3.88ha	Vacant
Lot 1 on RP724792 Title Ref: 20864025	2173m^2	Register Proprietor
Lot 2 on RP746114 Title Ref: 21360116	2515m^2	Register Proprietor
Lot 3 on RP746114 Title Ref: 21360117	2000m^2	Register Proprietor
Lot 4 on RP746114 Title Ref: 21360118	28.266ha	Vacant
Lot 4 on RP749342 Title Ref: 21418082	30.74ha	Vacant

Figure 2: Development site



The total area of the site is approx. 343 ha with 273 ha located east of Yorkeys Knob Road, 43 ha west of Yorkeys Knob Road and north of Dunne Road and 27ha south of Dunne Road. Reserve land borders the site to the north-west, north-east of Yorkeys Knob and along the eastern boundary of the site to the ocean. The southern boundary is Richters/Thomatis Creeks.

The site consists of a number of a large rural holdings, which are currently being used for sugar cane farming. A dwelling and outbuildings are located towards the southern end of the eastern parcels. There are three occupied dwellings located on small parcels which front Yorkeys Knob Road. The site is generally cleared with bands of vegetation bordering the outer boundaries of the eastern parcels, containing riparian vegetation and buffers to the creeks and coastal systems to the east, south-east and south. The western parcels are also predominantly cleared and are used for rural purposes with no dwellings, structures or improvements. The site is generally low lying falling from west to east. Figure 3 shows the development site in relation to existing Yorkey's Knob and the mouth of Richter's Creek

Figure 3: Aerial Photo of Development Site

4.0 THE PROPOSAL

Aquis Resort at The Great Barrier Reef is a fully integrated master planned resort and tourist facility which has the opportunity to set a new benchmark for tourism development in Northern Queensland.

The project will transform the existing open rural land into a $4.2 billion tourist destination comprising:

- A Resort consisting of a range of accommodation and ancillary facilities catering for short stay tourists including
    - around 3,750 hotel rooms configured within 9 luxury hotel brands;
    - 1200 centrally managed apartments
    - 135 centrally managed Villas
    - 13,500 m^2 of high-end retail shopping; Restaurants , Bars and food and beverage outlets
    - an international class casino;
    - one of the world's largest aquariums;
    - 2 x 2,500 seat theatres
    - 13 ha reef lagoon as a central feature;
- a 65ha Lake surrounding the built form
- an18 hole championship golf course including driving range and club house
- a 25,000 seat rectangular sports stadium catering for Rugby/Soccer;
- a 45,000m^2 convention and exhibition centre;
- 1800 staff accommodation units
- a cultural heritage centre; and
- a 13 ha Water Park
- ancillary facilities including access roads, water supply mains , Sewage Pump stations and electrical , communications services infrastructure, administration and maintenance facilities.
- Upgrade of external trunk services and associated infrastructure including water supply, sewerage, electrical and communications to cater for anticipated demands from the development
- Upgrade of external local and state controlled road networks to cater for the anticipated traffic generation and transport needs.

The proposal does not include any permanent residential elements.

Attached in **Appendix A** is an annotated Architectural Presentation showing the project concept.

Construction work will include, but not be limited to:

- -site preparation including site clearance,
- -establishment of a number of temporary administration buildings and worker facilities
- -a number of laydown areas, installation of temporary and permanent fencing,
- - installation of erosion controls,

- -installation of drainage and water, stormwater and wastewater management controls and construction of site access
- -civil works including bulk earthworks, soil treatment, construction of cuts and embankments,
- -construction of temporary haul roads, bridge and watercourse crossing construction,
- -development of borrow areas
- temporary concrete batching plant

4.1 Project need, justification and alternatives

Aquis Resort at The Great Barrier Reef will bring the attention of the world to North Queensland. It will be Australia's only genuine, world-class, integrated resort.

Key to attracting increased international tourism is the provision of accessible, man-made facilities that provide necessary attraction in themselves, to tourists who can then avail themselves of the natural wonders and beauties of that area. There is no doubt that North Queensland has wonderful natural tourism assets, including the Great Barrier Reef, the tropical North and the Tableland. Being located one non-stop flight from China, the rest of Asia and the Middle East gives North Queensland a significant competitive advantage over many other Australian destinations.

North Queensland is missing the man-made wonder of the world, which is presented in Aquis. This will complete the necessary package to attract international tourism. Aquis Resort at The Great Barrier Reef will allow North Queensland to benefit from the increasing trend of outbound tourism from Asia, particularly China.

By providing the world class facilities to attract China's middle class the Project will stand as a beacon in the Australian tourism market.

Facilities of the like of Aquis Resort at The Great Barrier Reef don't only attract the Chinese mass market middle class, but also the big spending, high value, ever expanding Chinese upper class. The Project will attract international tourism from around the globe. Australia's exposure to the Indian wedding market is far less significant than what it could potentially be. Aquis Resort on The Great Barrier Reef will give North Queensland a unique opportunity to enter this market amongst many others.

Aquis Resort at The Great Barrier Reef will be of such high quality that it will have the ability to attract to North Queensland international Government and business conventions and exhibitions, major sporting events and international meetings and conferences. The resort intends to partner with the world's leading hotel and apartment operators to provide a host of accommodation offerings to suit every taste, need and style.

Recent Tourism Research Australia figures (released July 2013) show that Australia received 5.7 million overseas visitors in the 12 months to March 31, who spent more than $19 billion. Sadly, North Queensland's share was only 691,000 visitors who spent $877 million. Aquis Resort on The Great Barrier Reef provides an opportunity to increase overall visitation to Australia, as well as relevantly increase North Queensland's share of those visitation numbers with the aim of exponentially increasing what those visitors spend in the region.

This resort will also be an asset which will attract domestic tourism from throughout Australia and New Zealand, through a renewed interest in the tourism assets of the Tropical North.

Domestic conferences, conventions and other business and event based traffic will be drawn to the world class facilities on offer. Aquis Resort at The Great Barrier Reef is equally focussed on increasing North Queensland's competiveness in the domestic tourism market as it is for the international market. It will become an icon that every Australian will seek to visit at least once in their lifetime, and visitation will grow substantially from the domestic market as well as the international market.

Aquis Resort on The Great Barrier Reef will be an inclusive facility - whether a local retiree or a Chinese billionaire, all will be welcomed, treated equally, and feel special. The resort's planned integrated transport structure will only enhance the desire of locals to visit Aquis and to utilise its wonderful facilities. Aquis Resort at The Great Barrier Reef will attract acts, events, exhibitions and performances in sport, art, entertainment and culture of the likes never before regularly seen in North Queensland, for the direct benefit and enrichment of the local community. The need to travel away to see world class acts and exhibitions will be all but negated. Aquis is the unique facility that the local North Queensland community needs and deserves for its social enrichment.

A Preliminary Economic Impact Assessment prepared by KPMG was prepared as part of the proponent's pre-feasibility studies for the Project. A copy that report has been submitted to the Coordinator General's office as an appendix to the Proponent's Pre-feasibility Statement. The results of that report are summarised in 6.0 Economic effects.

Key outcomes of the KPMG assessment include:

- direct expenditure during construction of in the order of $4.2B in current day expense terms;
- significantly increasing annual Gross State Product during construction;
- increasing annual Gross State Product once operating;
- increasing, on an ongoing and sustainable basis, revenues to State Government from payroll tax, Federal Government GST remission and significant gaming tax and fees once operating.

KPMG have established that:

- Aquis Resort at The Great Barrier Reef will create 16,600 jobs at peak construction (9,300 direct and 7,300 indirect)
- Aquis Resort at The Great Barrier Reef will create 26,700 jobs when fully operational (10,000 direct and 16,700 indirect).

Such outcomes make plain that:

- the issues relating to very high 'low season' unemployment in Cairns will become a thing of the past ;
- supplying the ongoing staffing of the resort means training programs for youth will need to be developed through James Cook University and other local tertiary institutions, which will result in North Queensland becoming more integral tertiary education provider;
- there will be significant training and employment opportunities for indigenous youth; and
- Aquis Resort at The Great Barrier Reef will act as a form of risk mitigation to the likely resources boom deflation.

Based on these preliminary economic findings and the strategic benefits to Cairns, the region and the State there is no feasible alternative to Aquis at The Great Barrier Reef. Should the Project not proceed it has been demonstrated that there would significant loss of business, employment, revenue and flow-effects

Should this development not proceed, there would be a significant loss to the state, the region and Cairns in terms of:

• Financial benefits to the immediate area at a local and regional level

• Loss of investment reputation

• Loss of opportunities for leadership and innovation in tourism

• Loss of opportunities for collateral tourism investment, development and marketing

• Loss of a sustainable and reliable incomes in relation for tourism, business, the performing arts, cultural activities and sporting events

• Loss of opportunity to the state to develop substantial tourism infrastructure from private investment, without state financial assistance required

• Loss of gaming tax revenue to the state from the revenue of the casino

4.2 Timeframes for the project

At this stage it is the stated intent (working in partnership with the Queensland Government, the local authorities, community and other stakeholders) of the AQUIS consortia, subject to achieving the necessary approvals (refer section 8) is to commence significant site works in mid 2014, with project completion mid to late 2018.

4.3 Construction and operational processes

Key construction processes that will need to be considered include:

- Access to water for civil works construction
- Sourcing and transport of construction material including , quarry products and concrete and construction materials and associated logistics of haulage to site.
- Daily transport and/or parking for the construction work force.
- Water Quality Management
- Management of Acid Sulphate soils
- Site management during cyclonic and flooding events
- Waste management and disposal
- Emergency services access

Key operational processes that will need to be considered include:

- Potable water supply and fire fighting
- Sewerage and waste disposal
- Power mains and back up supply
- Transport and delivery of goods and produce
- Daily transport and/or parking for the work force.
- Transport and parking for guests and users of the development facilities
- Water Quality and Stormwater Drainage Management
- Emergency services access
- Special events (Theatre and Stadium)

4.4 Economic indicators

Aquis will provide financial benefits to the State of Queensland both directly and indirectly in addition to heightened financial and investment reputation. Some key points include:

- Ongoing, sustained, increasing tax revenue
- Gross State Product will increase on an ongoing basis; and
- Jobs for Queensland will be created (subject to an expedited approval process from as early as 2014).

Queensland will also gain a reputation as a leader and innovator in tourism investment, development and marketing and will stand well positioned to attract other significant tourism investment from the Asian region.

Such benefits will be sustainable and reliable and will ensure North Queensland becomes a significant Australian destination for tourism, business, the performing arts, cultural activities or sporting events. Aquis will provide increased opportunities for the benefit of both tourism and accommodation operators in North Queensland.

In recent years many issues have had an impact on tourism in North Queensland but, despite all these impacts, tourism income has grown from approximately $400 million per annum in the 1980's to its current value of around $2.2 billion to $2.4 billion per annum.

Tourism Tropical North Queensland in its Strategic Marketing Plan 2011- 2015 stated:

> *"With an increased investment in tourism marketing, a tourism industry goal of $3.2 billion in visitor expenditure is possible – an additional $1 billion injection to the economy (by 2015)."*

Aquis aims to supercharge this target, seeking to take North Queensland tourism expenditure greater than $5 billion per annum from commencement of operations.

Aquis intends to operate with a collaborative approach rather than a competitive approach to local tourism operators. Macau provides a clear, real world example of this philosophy in operation, with each integrated resort assisting its customers and competitors by providing free transport between resorts, facilities and tourism providers.

As Aquis does not intend to provide any significant tourism activities itself it envisages a system of free return transport allowing guests to easily and freely visit the Cairns CBD, major Cairns transport hubs, all major local tourist attractions and tourism providers, such as reef tour departure points. Aquis accommodation options will not suit all travellers, nor will they be sufficient as the expected inbound tourism numbers grow, hence allowing all local accommodation providers to benefit. The Aquis free transport system will allow travellers to stay away from the resort while benefitting from occasional use of the resort's facilities. Every business in North Queensland stands to benefit from what Aquis will bring to the local community.

The lack of any proposals for, or any actual prior projects of the scope and scale of Aquis, plainly demonstrates that such a project is not financially feasible without the fiscal support provided by a casino licence. Similarly, the most significant revenue benefits to the State come from the gaming tax imposed on a Casino's operations.

The business case that a casino underpins the economics of such an international class project is well understood and widely accepted. Whilst Aquis is a 'mega resort' project the proposed casino is only marginally bigger (in terms of tables and machines) than, for example, Crown Melbourne.

4.5 Financing requirements and implications

The proponent's financial and technical capability statement and pre-feasibility statements are submitted under separate cover and are provided on a 'Commercial in Confidence: basis.

5.0 DESCRIPTION OF THE EXISTING ENVIRONMENT

5.1 Natural environment

5.1.1 Climate

The Cairns area has a tropical environment, with a significant monsoon season. Winter months are mostly fine whilst summer months are hot and humid. Thunderstorms typically start in late September or October, while monsoon rains that occur from late November through until early May deliver the highest rainfall.

The area is prone to tropical cyclones (generally from November to May). Cyclones can approach the Cairns area from any direction and those that approach from the east with landfall just north of Cairns are expected to produce the worst storm surge related flooding (principally on the northern beaches). Although storm surge and Barron River flooding often occur as a result of the same event (i.e. a tropical cyclone), the large catchment of the Barron means that the flood peak is delayed by up to a day or more from the time when the cyclone hits the coast. This means that the peak storm surge is very unlikely to coincide with the peak flood.

5.1.2 Land

Topography

The site consists of flat, low-lying land that lies within the Barron Delta in the catchments of Richters Creek, Yorkeys Creek, and Half Moon Creek. Some parts of the site are inundated by the highest high tides. East of Yorkeys Road the land falls gently to the north and north-east towards Yorkeys Creek and Richters Creek whilst the western lots drain northward into Half Moon Creek.

There are no notable topographic features other than Richters Creek that flows along the eastern boundary and patches of remnant vegetation. Part of the site is within a designated Erosion Prone Area and coastal processes will be an important design consideration for the project.

Land Use

The site is currently used for growing sugar cane and approximately 90% of it has been cleared of natural vegetation for this purpose. Some remnant vegetation remains near the boundaries and along some degraded drainage lines.

Strategic Cropping Land (SCL)

The land is currently designated as “Strategic Cropping Land” under the Strategic Cropping Land Act 2011 and the SPP 1/12 Protection of Queensland strategic cropping land.

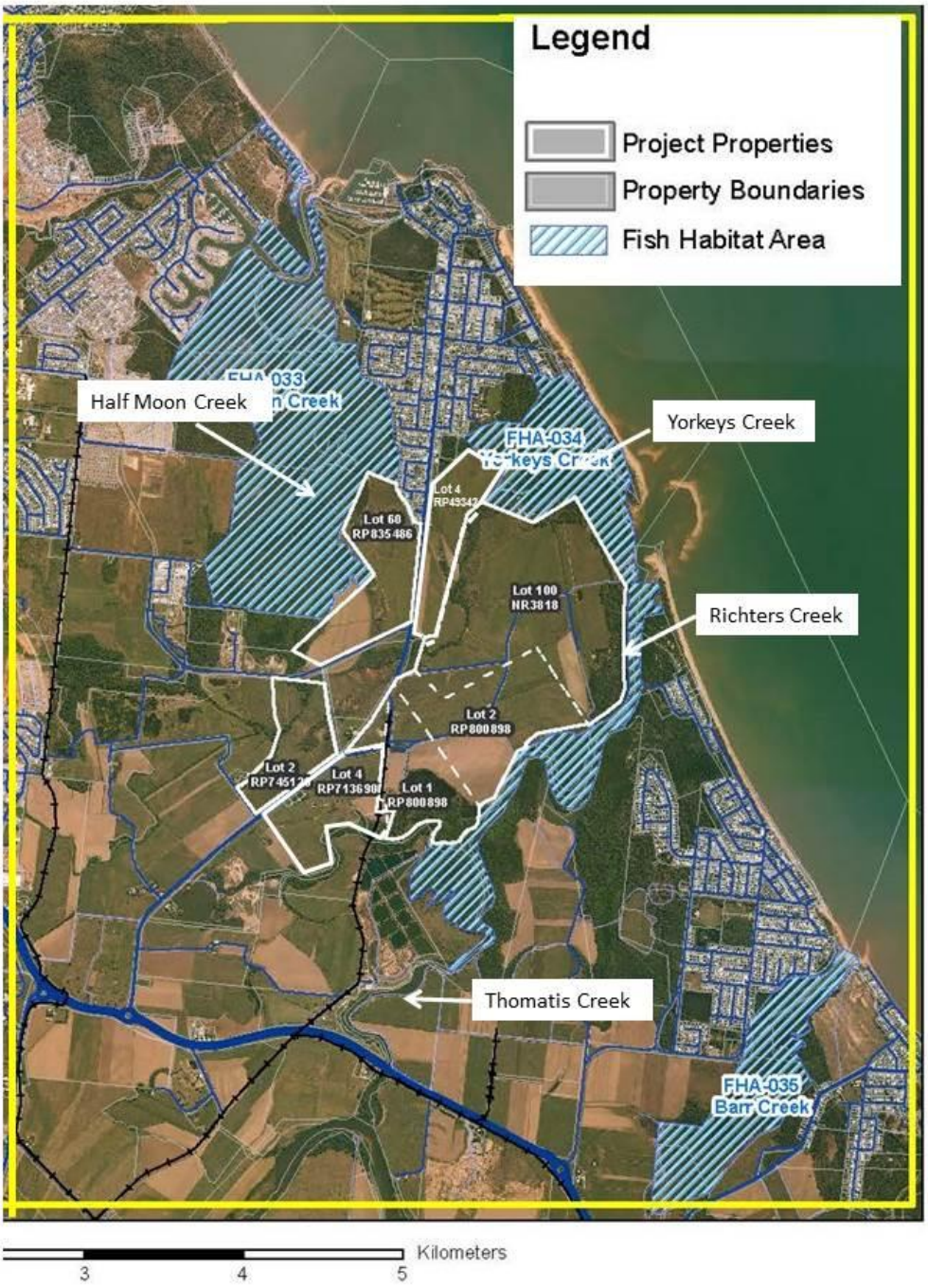
The purpose of this Act and State Policy is to “ensure that planning and assessment of Projects includes appropriate consideration of SCL.” To assist the understanding of the agricultural context and productivity of this site, an accredited agronomist will be commissioned to prepare a Report to assist government assess this Project in accordance with this legislation.

Protected Areas

The following protected areas lie within the vicinity of the site:

- the Yorkeys Creek Fish Habitat Area (FHA-034) located on Yorkeys Creek,
- the Half Moon Creek Fish Habitat Area (FHA-033), and
- the GBR Coast Marine Park.

Figure 4 -Protected Areas



Soils and geology

The site, within the Barron River floodplain, is formed of unconsolidated Holocene age alluvial deposits of sands, gravels, silts and clays. The majority of the site is mapped as covered by zones of younger creek alluvium and coastal tidal flats, mangrove flats, supra-tidal flats and grasslands. The main variation to these zones is a sand ridge along part of the eastern boundary.

These Holocene age deposits are underlain by older consolidated alluvial deposits of stiff to hard clays and inter-bedded layers of medium dense to dense sands and gravels.

Significant variations to this generalised subsurface profile do occur including layer thicknesses and soft clay inclusions and zones associated with paleochannels and varying depositional conditions across the site.

Thicker sequences of soft clays are known to be present along the southern, eastern and northern extents of the site. The identification of these areas is based on limited data and will need to be refined during preparation of the EIS.

Groundwater

The Department of Natural Resources and Mines (DNRM) groundwater database indicates the presence of 21 registered groundwater bores on the subject site. Many of these bores have been abandoned and/or destroyed. The bore depths range from less than 4m to more than 100m. These records indicate the presence of an upper unconfined aquifer within the younger alluvial deposits and a semi-confined aquifer within sandy/gravelly zones within the older consolidated alluvium. Measured water levels in both aquifers between 1980 and the present have ranged between about 0.5m to 2m below the ground surface.

Water quality information indicates that:

- The upper unconfined aquifer is variable quality - from brackish to fresh;
- The upper unconfined aquifer is degraded and has a low pH with possible metals impact from historical disturbance of ASS;
- The deeper semi-confined aquifer(s) is probably fresh.

Acid Sulfate Soils

Cairns Regional Council Acid Sulfate Soils (ASS) Planning Scheme Overlay maps indicate that ASS is likely to be encountered over the entire site. DNRM has also produced more detailed ASS risk maps at a 1:50,000 scale which provide indications of the depth at which ASS is likely to be encountered.

ASS materials will be confined to the younger alluvial deposits and are unlikely to be encountered within the underlying older alluvium. It is expected that the acid generating potential of sandy materials will be significantly lower than soft clay materials.

Landscape and visual amenity

The site lies within a rural setting and contains agricultural land dedicated largely to cane farming and associated out-buildings. Yorkeys Knob Road is a rural standard two lane road that bisects the parcel. A Service Station is constructed on raised land west of the road just south of the CRC Reserve. The main areas providing views of the site are:

- the Kuranda Range Road (especially the Henry Ross Lookout roughly 4 km to the west) – provides a panoramic view of the Barron River Delta and its mosaic of townships, canefields, and remnant riparian corridors,
- the Captain Cook Highway (roughly 1.5 km to the west) – provides mid-field views to the east, with cane land in the foreground and the Richters Creek and Yorkeys Creek riparian fringes to the east and north-east, and
- Yorkeys Knob Road (bisects the site) – provides near-field views of the cane lands and out-buildings and more distant views of the Richters Creek and Yorkeys Creek riparian fringes to the east and north-east, and Half Moon Creek to the north.

The site is also very visible from the air as it lies in the northern flight path at a point close to the airport and where planes are flying quite low. The Richters Creek mangrove forests and woodlands adjacent to the site (but not the site itself) are visible from the southern end of Yorkeys Beach, the northern end of Holloways Beach, and ships at sea.

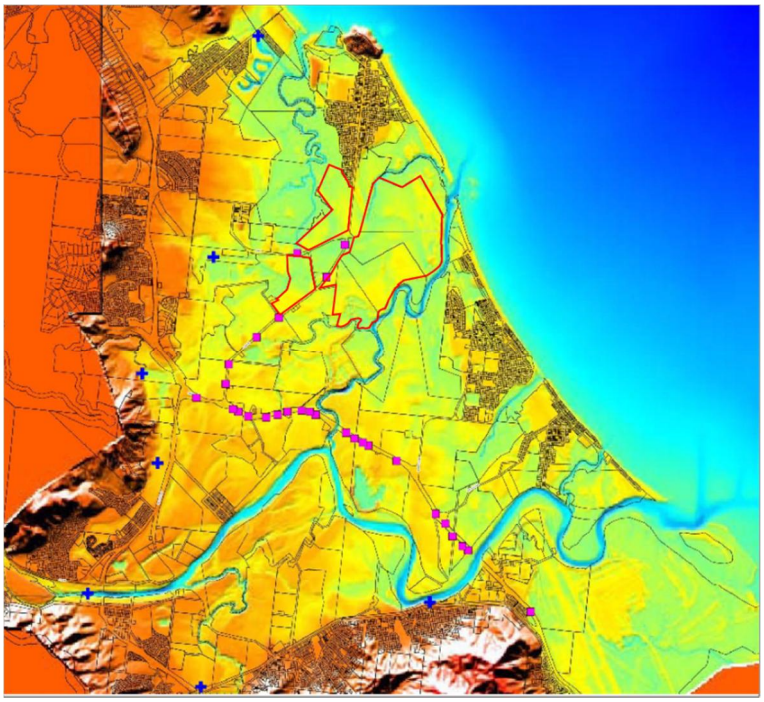
5.1.3 Hydology and Hydraulics

The Barron River has a catchment area of 217,500 hectares and drops from the Atherton Tablelands through the Barron Gorge before reaching the Barron Delta, which has several bifurcations to the sea, including Thomatis-Richters Creek which is immediately to the east of the subject site.

Being a delta, it is a mobile system and over geological time, the main river channel has moved from Half Moon Creek, in the north, as far south as Saltwater Creek which runs through the airport. In recent years, there has been considerable erosion along Thomatis-Richters Creek which carries as much as 30% of main channel flows during bank full floods.

Figure 5 shows the full extent of the delta. This figure also shows topography using a shading scheme from red (high land) to green (low land)..

Figure 5: The Barron River Delta Floodplain



Regular flooding occurs in the Barron Delta and across the site. Gauging records are available since 1915, with at least a dozen major floods in that period that would have inundated the site. Major flooding also occurred in 1911 and 1913 from historic records, and these were very severe floods, around the 1% annual exceedance probability, or ARI 100 year level.

The mouth of the Richters Creek is dominated by longshore sand transport in periods where river flows are low, with the creek mouth intermittently closing. During floods the entrance is blown out and the degree of entrance closure affects flooding on the eastern portion of the site.

Figure 6 shows the site and its proximity to Thomatis-Richters Creek in the east, and Half Moon Creek in the west.

Figure 6: Site relationship to Richters Creek

Flood Levels

Table 1 provides approximate peak water levels and depths primarily associated with the site.

TABLE 1: PEAK FLOOD LEVELS

Event	Approximate Peak Water Level (mAHD)			Approximate Depths (m)		
	Upper	Mid	Lower	Upper	Mid	Lower
ARI 5	3.0	2.5	2.5	0.6	0.5-1.5	0.5
ARI 100	4.5	4.3	3.5	2.5	1.0-3.5	2.0
PMF	7.5	6.5	5.0	5.5	4.5-5.5	3.0-3.5

5.1.4 Water quality

Site drainage during non-flood conditions is principally via Richters, Yorkeys, and Half Moon Creeks. Water quality in these waterways is tidally influenced, with significant freshwater flows during the wet season. Thomatis Creek acts as a distributary from the Barron River by linking Richters Creek and the Barron River and so it is likely that the quality of the two watercourses is similar. It is known that the waters of Thomatis Creek / Richters Creek are well-mixed but, at times, exhibit a weak salt wedge between the mouth and the Barron River bifurcation.

It is likely that local creeks are typical of coastal streams and estuaries in the Wet Tropics Region. However, Yorkeys Creek is severely degraded by acidic and metal contaminants arising from areas of acid sulfate soils in the catchment which impact on local water quality at times. Near-shore water is of poor quality (especially Suspended Solids, Chlorophyll a, and Particulate Phosphorus). It is likely that the Barron River discharges dominate near-shore water quality.

It is known that sugar cane farming can result in significant exports of suspended solids, nitrogen, and phosphorus, with typical Barron River catchment figures being 19 t/km2, 1.0 t/km2, and 0,07 t/km2 respectively. It is planned to adopt Water Sensitive Urban Design principles for the development and as noted in Section 6.1.4, these are known to be able to reduce exports of these pollutants significantly. This will be further addressed in the EIS.

5.1.5 Air Quality

In general, air quality is not currently an issue of concern in the Cairns area. The majority of pollutants emitted from within the Cairns air shed are thought to originate from motor vehicles and industrial sources in the vicinity of the (sea) port. Particulate matter concentrations arising from non-motor vehicle sources, such as bushfires, may continue to result in elevated levels on occasions.

The key atmospheric determinant of air quality is the climate of prevailing winds. In the winter months, Cairns is influenced by high pressure systems which cause cool, dry winds from the south-east. During the summer and early autumn months, the highs move southwards, bringing warm moist air and resulting in high rainfall.

The site currently experiences occasional fuel dumping from low-flying passenger jets and this could be expected to adversely affect local air quality at times.

5.1.6 Greenhouse Gas Emissions

The site can potentially produce 13,000 tonnes of cane per annum which is transported to Mulgrave Mill (at Gordonvale – 40km to the south) This can result in nearly 8,000 tonnes of greenhouse gas (CO_2 equivalent). The overall production of greenhouse gas by cane farming can be reduced significantly if surplus bagasse is burned as fuel used to produce electricity. Mulgrave Mill generates all of the power required by the crush in addition to exporting electricity to the State grid. This situation can result in a net greenhouse gas credit for sugar cane.

5.1.7 Ecosystems

Prior to European settlement, the Barron delta contained a mosaic of coastal, riverine, and lowland vegetation communities dissected by the Barron River itself, the Thomatis Creek distributary, and many major creeks. Within the Study Area lie Thomatis Creek, Richters Creek, Yorkeys Creek, and Half Moon Creek. These waterways have intact riparian vegetation in their lower reaches in the vicinity of the site and the latter two terminate in Fish Habitat Areas / Estuarine Conservation Zones.

Like most of the Barron Delta, the site has been used for sugar cane farming and this has resulted in a fragmentation of the natural landscape.

Typical of most farms in the area, the site contains little natural vegetation apart from remnants around some boundaries and several (internal) degraded streams. It is likely that despite the extent of catchment clearing for farming and urbanisation, the ecological function of the site and its surrounds remains to some extent.

Offshore lies the Great Barrier Reef World Heritage Area (GBRWHA) and the Great Barrier Reef Marine Park (GBRMP). These areas have recognised internationally-significant values that depend to some extent on the integrity of terrestrial and aquatic habitats and ecological process and their connectivity to marine ecosystems.

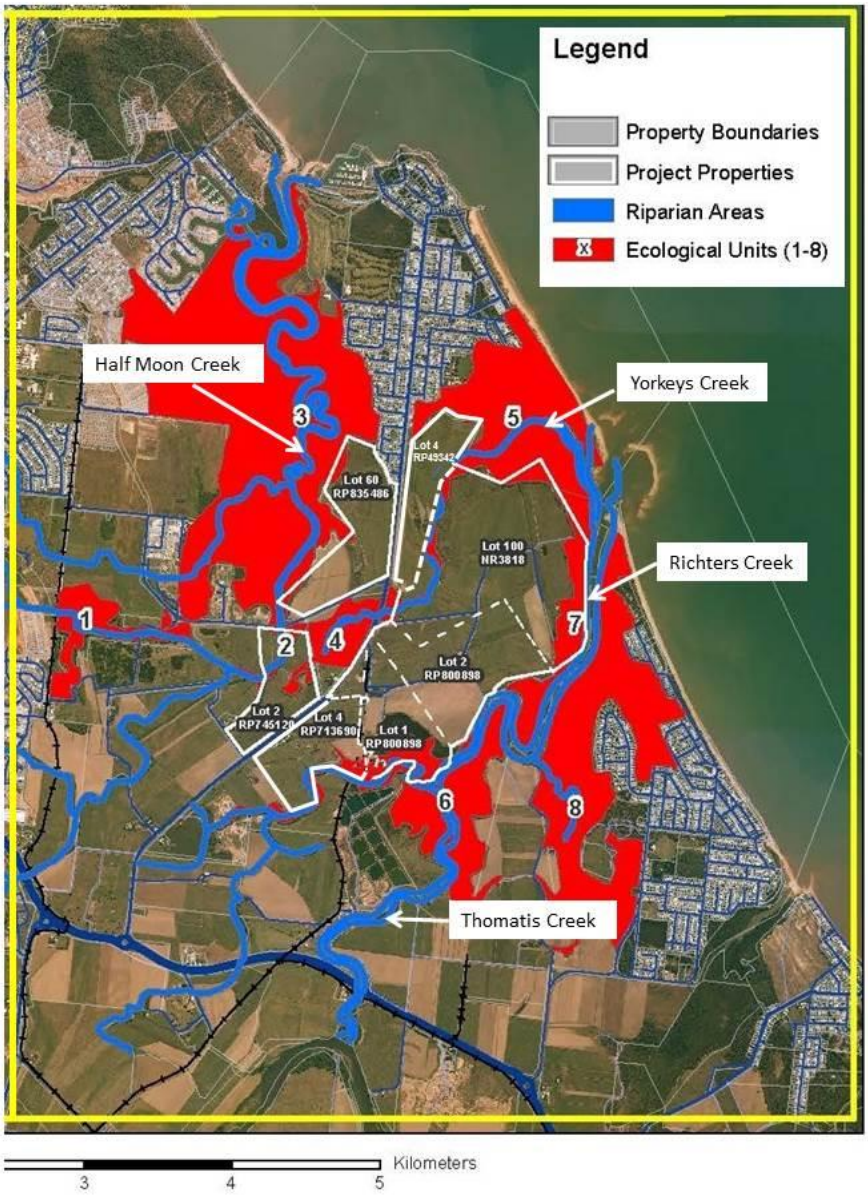
An Environmental Analysis of the site and its surrounds was undertaken using available ecological information to produce a composite environmental values is shown on Figure 7 :

- shaded areas labelled 1 to 8 are remnant areas with recognisable ecological values that interact to provide some ecological function in the landscape, The assessment does not rate these values against any scale as this is an appropriate consideration in the EIS and
- blue lines are existing riparian areas – these serve to connect the Ecological Units, often despite the degraded condition of adjacent areas (i.e. where no Ecological Unit is shown adjacent), and
- unshaded areas within the designated Project Area have virtually no remaining ecological values.

The values of the Ecological Units also take into account mapped areas of significance (i.e. Fish Habitat Areas, marine parks, wetlands etc.).

This analysis shows that the majority of the site has relatively low to moderate conservation values and that adjacent areas contain most of the higher value sites. The site sits within a highly disturbed landscape and even adjacent natural areas are ecologically isolated and subject to pressures from the surrounding developed landscape. However, in the broader landscape context, the site contains important fringing vegetation and a number of watercourses which provide varying levels of aquatic connectivity. In this way the site is intimately linked to adjacent areas of higher conservation value. The actual contribution that the site makes to the ecological function of the broader area is a matter that will need to be addressed in the EIS and considered in detailed design

Figure 7: Composite environmental values of the Study Area.



Ecological Features

The environmental analysis provides an overview of the system as a whole. Ecological features also considered in the Environmental Analysis and present on or near the site include:

- protected areas (e.g. the GBRWHA, GBRMP, Queensland Marine Park, Fish Habitat Areas),
- regional ecosystems (small areas of “Of concern” and “Least concern” regional ecosystems around the fringes of the site), wetlands, and
- Environmentally Sensitive Areas (ESAs) generally included in one or more or the above categories.

Flora and Fauna

Based on an initial search of Queensland and Commonwealth databases and local knowledge, it appears that several species of flora and fauna listed under both the NC Act and EPBC Act could be found on or adjacent to the site. These are summarised below:

- *Casuarius casuarius johnsonii* (Southern cassowary) – unlikely to occur,
- *Crocodylus porosus* (Saltwater crocodile) – known to exist in Richters Creek and most likely the Yorkeys and Half Moon Creeks,
- *Erythrotriorchis radiatus* (Red goshawk) – may use all elements within the study area, but presence very spasmodic at best, and
- *Myrmecodia beccarii* (Ant plant – epiphyte found in Melaleuca woodlands and mangroves) – may be present on banks of Richters Creek.

A number of other NC Act and/or EPBC Act listed species (particularly wetland species, migratory birds and birds of prey) are expected to overfly the site or utilise the fringing habitats. Suitable habitat for these species occurs along the riparian zones and within the mangrove and wetland areas on the eastern and northern boundaries of the site. In addition, various marine species of conservation value (e.g. dugong, turtle, and other marine megafauna) are thought to / known to inhabit the offshore waters (to be confirmed in EIS). These species depend on the continued presence of good water quality.

5.2 Social and economic environment

5.2.1 Economic and demographic characterisation

The Cairns region has an estimated population of 165,859, as at 30 June 2012, and annual growth rate of 1.9%[1]. Persons aged 15 to 64 years of age represent 68.8% of the population with a median age of 36 years.

Couples with children represent 26% of households in Cairns with over 65% of dwellings being single detached houses. House sales in the 12 months ending 30 September 2012 totalled 3,723 dwellings (2,221 detached dwellings and 1,502 attached dwellings). The median sale price was $345,000 (detached dwelling) and $202,000 (attached dwelling).

There is an unemployment rate of 8.4% (December quarter 2012) or 8,000 people. At the same time Queensland had an unemployment rate of 5.8%.[2] Of the 62,556 people who work in the Cairns area, 96% live in the area. Of these, 34% live and work in their immediate area and 61% travel within Cairns to get to work.

In relation to transport, there are 63,553 vehicles in the Cairns local government area, with 82.3% of households owning at least 1 vehicle. Only 8.5% of households do not own a vehicle. There is also an emerging trend of increasing vehicle ownership with more households opting to own two vehicles and decreasing numbers of household without a vehicle.[3]

The Yorkeys Knob – Machans Beach area has a population of 6,300 persons with 72.9% aged 15 to 64 years and median age of 40.3 years. Unemployment in this area is 11.5%, however, this reflects a higher number of retirees, higher percentage of attached dwellings and the remoteness of these suburbs from the main Cairns recreation, education and employment centres. The local labour force is 3,731 persons.

[1] http://statistics.oesr.qld.gov.au/report- iewer/run?__report=profile.
[2] Based on Australian Bureau of Statistics, Australian Statistical Geography Standard (ASGS), July 2011.
[3] Source: Australian Bureau of Statistics, Census of Population and Housing 2006 and 2011.

No new dwelling units or residential buildings were constructed in the Yorkeys Knob – Machans Beach area during the 12 months ending 31 March 2013. Alterations, additions and conversions during that period equated to $811,000.[4] Residential sales were also low with 146 dwellings (66 detached dwellings and 80 attached dwellings) sold in 12 months ending 30 September 2012.[5]

Businesses in the Yorkeys Knob – Machans Beach area are predominantly small business 97% (less than 20 people), 3% medium sized businesses (20 – 200 people) and there are no large business (200+ persons). In terms of industry types, the three main industries are construction (28.4%), professional, scientific and technical services (10%) and rental, hiring and real estate services accounts (9.6%). Retail trade accounts for 7.9% or 36 registered businesses and accommodation and food services is 5.5% or 25 registered businesses.

5.2.2 Accommodation and housing

The proposal will generate demand for workforce accommodation during the construction phase and for permanent accommodation for the operational workforce. Some of the workforce will be existing residents of the Cairns area, some will move to Cairns for the duration of construction and some will move to Cairns to work in the resort facilities.

5.2.3 Social and recreational services

Yorkeys Knob has a supermarket, post office, bottleshop, bakery, and a variety of other shops. A newsagent and a small store are on the beachfront. It has a small number of restaurants including the one at the Half Moon Bay marina.

Close by attractions include Skyrail, Cairns Kart Hire, Cable Ski Hire, Tjapukai Aboriginal Cultural Park, Golf Driving Range, Half Moon Bay Golf Club. Further afield is Barron River White water rafting, Bungy jumping, Kuranda Scenic Railway, Paradise Palms Golf Club, Cairns Zoo, Hartleys Croc Farm, horse riding, a variety of fishing experiences, Great Barrier Reef, Daintree Rainforest and attractions and activities on The Tablelands. Half Moon Bay Golf Club, Yorkeys Knob is a short layout (5,129 metres long and par 70).

Yorkeys Knob is serviced by Sunbus seven days a week, running hourly Monday to Saturday, and every second hour on Sundays. This service also runs to the Smithfield Shopping Centre. A direct service is available during peak periods, travelling to Cairns in the mornings and back to Yorkeys in the late afternoon.

The site is 5 km south east of Smithfield Shopping Centre, the main shopping centre of the northern beaches. It contains over 60 speciality stores, medical centre, Coles, Woolworths, K-Mart, MacDonalds, Hungry Jacks, all the banks. Smithfield also has a 50m swimming pool, 25m heated pool and splash pool, Council Library, and the Marlin Coast Youth Recreational Centre. Smithfield State High School is also located in this area.

[4] Source: Australian Bureau of Statistics, *Building Approvals, Australia*, various editions, cat. no. 8731.0
[5] Source: Department of Natural Resources and Mines, Office of the Valuer-General, Property Sales

5.2.4 Cultural heritage (Indigenous and non-Indigenous)

Indigenous cultural heritage

The study area is within the territory of Yirrganydji Traditional Owner group. A cultural heritage study, undertaken by Grimwade & Cribb (1991)[6] notes that the subject site contains "sparse shell middens and scatters and three non-indigenous post-contact sites". Further details are currently unavailable. A cultural heritage study will be conducted as part of the EIS. and a Cultural Heritage Management Plan will be prepared.

Non-indigenous cultural heritage

The only nearby site listed on the Queensland Heritage Register is the former (relocated) Innisfail Court House located at 40 Buckley Street, Yorkeys Knob.

As part of the EIS, further work on non-indigenous post-contact sites in the Yorkeys Knob – Machans Beach area will be undertaken.

5.3 Built environment

There has been no large scale integrated tourist resorts constructed in the Cairns region since the Mirage Resort, Port Douglas in the late 80's. Accommodation and hotels within the Cairns City area have expanded since the 90's with a focus more on refurbishment and renewal of existing resorts during the 2000's. There has been a shift from hotel units towards serviced apartments within the area which has addressed changing trends in travel and tourist accommodation to the area.

The only declared coordinated project north of Townsville is the Ella Bay Integrated Resort. It was approved by the State Government in November 2012 and the Federal Government (controlled action) in December 2013. The proposal, by Satori Resorts Ella Bay Pty Ltd is the redevelopment of a 470ha cattle station to an integrated tourism and residential community. It is to be located 10km north east of Innisfail, in the Cassowary Coast Regional Council local government area.

The Ella Bay resort comprises 3 x resort precincts comprising 540 units and villas; 4 x residential precincts comprising 540 homes; village community precinct; research and education precinct; residential communal facilities, including swimming pools, tennis courts, playgrounds; Ella Bay Road upgrade and new bypass road.

5.3.1 Infrastructure

Current and future planning for roads, drainage and services infrastructure have not considered the demands created by the development. The demands created by the development will likely impact the following existing infrastructure:

- Sewerage : Trunk sewerage mains in Yorkeys Knob Road and the Marlin Coast Wastewater Treatment Plant.
- Water Supply: Trunk water mains between the Captain Cook Highway and Yorkeys Knob.
- Power : High voltage power transmission lines between the Captain Cook Highway and Yorkeys Knob.
- Telecommunications : Copper and optical fibre
- Roads and Highways : Yorkeys Knob Road and the intersecton of the Captain Cook and Yorkeys Knob Road.

[6] Study undertaken as part of research for previous proposal on this site

5.3.2 Traffic and transport

From the Cook Highway to Dunne Road, Yorkeys Knob Road is classified as a “Major Rural” road. Varley Street from Dunne Road into Yorkeys is classified as a 2 Lane Undivided Sub-Arterial. Based upon current configuration the Captain Cook Highway would have a capacity of around 40,000 to 50,000 vehicles/day.

Yorkeys Knob Road can be accessed via private car or vehicle, taxi, bus, hire car or limousine. It is possible to cycle and walk to and from Yorkeys Knob but it is a long walk from other urban centres or the airport. There is a bicycle lane on each side of the Captain Cook Highway, Yorkeys Knob Road and Varley Street. Dunne Road does not have a bicycle lane.

Yorkeys Knob is serviced by Sunbus seven days a week, running hourly Monday to Saturday, and every second hour on Sundays. This service also runs to the Smithfield Shopping Centre. A direct service is available during peak periods, travelling to Cairns in the mornings and back to Yorkeys in the late afternoon.

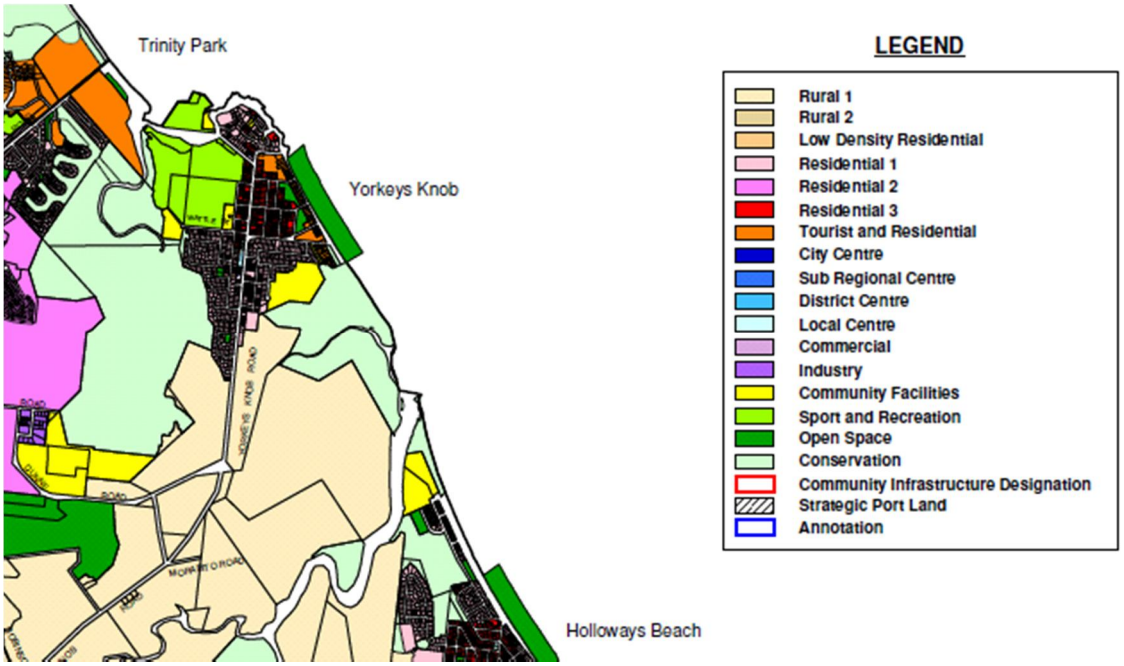
The Captain Cook Highway runs north-south from Palm Cove to Cairns City. It intersects with Yorkeys Knob Road to the south of the site. Intersection upgrades will be needed as Yorkeys Road has a low flood immunity. Multiple access points into the site will be needed. Traffic generation will predominantly come from the workforce coming and going from the development, not from overseas clientele.

5.4 Planning instruments, government policies

5.4.1 CairnsPlan 2009

The site is located within the Barron-Smithfield District under CairnsPlan 2009. The site is included in the Rural 1 Planning Area.

Figure 8: Extract of Barron-Smithfield Planning Area Map



District Information for the Barron-Smithfield Planning Area identifies that

> *”Yorkeys Knob is intended to provide opportunities for convention residential living, medium density residential living and for tourist accommodation in proximity to the waterfront..”*

The land is affected by the following CairnsPlan 2009 Overlays:

- Vegetation Conservation Value (Vegetation Category 1, Vegetation Category 2, Vegetation Category 4)
- Waterway Significance (Category 1,2,3 and 4)
- Connectivity Overlay (Open Space Links)
- Potential or Actual Acid Sulfate Soils Material (Land less than 20m AHD)
- Flood Inundation (ARI 100 year) (Defined flood Event 1:100 ARI)
- Obstacle Limitation Surfaces (Various – 46m AHD – 120m AHD)
- Australian Noise Exposure Forecast 2005 (Various – 20 ANEF – 25 ANEF)
- Primary Light Control Plans (Part Zone D450cd)
- Bird & Bat Strike Hazards (Area 2: 3-8km)
- Road Hierarchy (Yorkeys Knob Road – Sub arterial, Cane Haulage Railway)
- Pedestrian and Cycleway Movement (Yorkeys Knob Road – District route,
- Strategic Corridor (Possible Public Transport Corridors, Sugar Cane Railway)

5.4.2 Far North Queensland Regional Planning

The Far North Queensland Regional Plan 2009-2031 applies to the site. While the FNQ Regulatory Provisions no longer apply to the implementation of the Regional Plan, the FNQ Regional Plan contains the following regional policies that remain applicable in considering major new development in the region:

1. Natural environment (biodiversity conservation, coastal management, air and acoustic environment)
2. Regional landscape and natural resources (regional landscape values, natural resource management, scenic amenity)
3. Strong communities (social planning, social infrastructure, healthy and safe communities, sense of community and place, cultural heritage)
4. Urban Development (urban form, regional activity centres, housing choice and affordability, sustainable building and tropical design, environmental hazards,
5. Economic Development (growth and diversification, innovation and technology, primary industry, tourist development)
6. Infrastructure (planning and coordination, funding, energy, waste, information communication technology)
7. Water Management (protection of waterways, wetlands and water quality, total water cycle management, water demand and supply)
8. Transport (networks, infrastructure)

Each policy area contains desired regional outcomes, regional objectives and strategies. The listed elements under each policy will be addressed for its local and regional level of influence in assessing the potential impacts and likely mitigation and management of the concept plan for the proposed development. These will be further addressed in the preparation of the EIS.

5.4.3 Queensland State Planning Policies

The following are the current (July 2013) State Planning Policies that apply to development of the site:

SPP1/92	Development and the Conservation of Agricultural Land
SPP1/02	Development in the Vicinity of Certain Airports and Aviation Facilities 1.0
SPP1/03	Mitigating the adverse impacts of flood, bushfire and landslide
SPP1/12	Protection of Queensland's Strategic Cropping Land
SPP2/02	Planning and managing development involving acid sulfate soils
SPP3/10	Acceleration of compliance assessment
SPP 3/11	Coastal Protection (suspended by Draft coastal protection state planning regulatory provision on 8/10/12)
SPP 4/11	Protecting wetlands of high ecological significance in Great Barrier Reef catchments
SPP 4/10	Healthy Waters
SPP5/10	Air, noise and hazardous materials
TSPP2/12	Planning for prosperity (expires 24/8/13)
Draft SPP	State Planning Policy (public notification til 12 June 2013)

The Draft SPP is part of the State Government's suite of Planning Reforms. Following adoption, the Project would be assessed against the following state interests:

Housing and liveable communities

Amenity and community wellbeing

Land development and housing supply

Economic growth

Agriculture

Development and construction

Mining and extractive resources

Tourism industry

Environment and heritage

Biodiversity

Coastal environment

Cultural heritage

Healthy waters

Hazards and safety

Air, noise and other emissions

Hazardous materials and developments

Natural hazards

Transport and infrastructure

State infrastructure and services

State transport infrastructure and networks

Strategic airports and aviation facilities

Strategic ports

Water supply catchments and infrastructure

Each of these policies will be reviewed in detail during preparation of the EIS, using the principles identified for mitigating potential environmental impacts identified in section 6.0 of this report.

5.4.4 Commonwealth Matters of National Environmental Significance (NES)

The following table lists the matters of National Environmental Significance and relevant to the site.

TABLE 2: MATTERS OF NES AND RELEVANCE TO SITE

MATTER OF NES	DETAIL	NOTES
World heritage properties	Wet Tropics of Queensland WHA Great Barrier Reef WHA	Approximately 6 km west (upstream). Approximately 0.5 km east (downstream).
National heritage places	Wet Tropics of Queensland WHA Great Barrier Reef WHA	Approximately 6 km west (upstream). Approximately 0.5 km east (downstream).
Wetlands of international importance	Nil	
Listed threatened species and ecological communities	43 possible species 1 possible ecological community (Littoral Rainforest and Coastal Vine Thicket (Endangered)	Approximately 2.5 km south-west (cross country)
Listed migratory species	52 possible species	
Protection of the environment from nuclear actions	Nil	
Commonwealth marine areas	External to site	
The Great Barrier Reef Marine Park	External to site	Approximately 5.5 km east (downstream).

Source: Environment North (2013b) based on EPBC Act Protected Matters Report.

6.0 POTENTIAL IMPACTS OF THE PROJECT

6.1 Introduction

As is common when preparing an IAS, the design of the project is currently at a very conceptual level and will be developed during the EIS based on an improved understanding of the site's values, opportunities and constraints, as well as economic and engineering inputs. Accordingly, it is not possible to be definitive about impacts at this time. Rather, the focus of the impact assessment contained in this section is to outline likely impacts to the extent that these can be determined now, and rely on the principles that will guide the design as it evolves through the EIS process and beyond. The EIS will need to address cumulative impacts as well as consider external matters such as climate change.

Environmental management is intended to complement these design principles. In particular, all construction and operation impacts described below are intended to be managed via the proposed environmental management regime described in Section 7.

The development of the proposal concept has been based on an assessment of the site values and the development footprint respects existing remnant environmental values in a generally degraded environment caused by 50 years of agricultural activities on the land. The development proposal provides opportunities to rehabilitate some degraded areas of the site and to re-establish biological connectivity through the site.

6.2 Critical Issues

Critical Issues associated with the project predominantly relate to addressing flooding and water quality issues and coastal process.

6.2.1 Flooding

The proposed large lake system, coupled with piered structures above flood influence, is an hydraulic solution that should not result in unacceptable impacts on flooding beyond the site and would allow suitable development standards and emergency flood management planning for the project. Flood modelling work will be carried out to determine the appropriate arrangement and characteristics of the lake and site cut and filling profiles. This is likely to require numerous iterations with input in relation to water quality requirements for the lake, acid soils constraints, civil engineering, resort planning and environmental constraints. A project specific sub-model of Council's full delta model will be developed for this stage of the work, as it will allow quicker run times and allow rapid turnaround on development refinements..

The flood modelling process will be a dominant driver in the ultimate site earthworks requirements and a major input to the final development form and layout.

Emergency flood management is also a major issue for the project, which can be integrated with cyclone management for the site. Site access roads are cut at a low level and therefore the decision to evacuate needs to be very early in a flood event. An on site ability to shelter in place with suitable cyclone proof and flood proof facilities, with emergency food rations and water supply, medical and first aid requirements, and facilities for emergency medical evacuation during flood events by helicopter and boat will be provided.

6.2.2 Water Quality

Runoff from paved areas, landscaped areas and roof areas will be treated with conventional Stormwater management water quality control devices such as rain-gardens, bio-basins and sediment control devices. The main challenge in relation to water quality will be in achieving a suitable water quality in the site lake, and managing the risk of pollutants, such as algal blooms, low pH waters and aquatic plant growth leaving the site and entering receiving waters, and ultimately Trinity Bay. With tropical climate and seasonality, there is a significant risk of algal blooms and excessive aquatic plant growth, die-back, and low dissolved oxygen leading to aquatic fauna and flora die-off.

Saline lakes reduce the risk of excessive plant growth, and lakes that interchange between saline, to brackish to fresh have the advantage of reducing the potential for water quality problems whilst minimizing maintenance requirements. In the drier months, the system will progressively become saline, whereas with normal wet season flooding, the system would revert to fresh water for some months.

During major floods, there is also potential for sediment and flood debris to enter the lake system.

In the dry season, Richters Creek mouth can close, and whilst there is still tidal fluctuation in the creek from its connection upstream with the Barron River, the water quality deteriorates. The presence of a prawn farm upstream on the creek adds to the nutrient load. Lake depth will be a critical factor in the design; with management of dissolved oxygen levels, nutrient levels and pH critical to the design of the lake.

A tidal exchange system with Richters Creek alone together with supplementary internal lake circulation pumping and mixing, including vertical mixing, will be required. .

To control pH in the lake which may be an issue due to acid sulphate soils, the use of saline water and appropriate lake edge treatment (e.g. lime slots) is a tried and proven technique. Control temperature, mixing and lake depth are critical factors. To control dissolved oxygen levels, excessive aquatic plant growth will be managed, in conjunction with lake mixing. Artificial wetlands will be required with lake waters circulated through these wetlands. Plants such as mangroves that are primarily saltwater tolerant but can live in brackish and fresh water will be considered.

6.2.3 Coastal Processes

Cyclonic storm tide significantly affects the site, and under extreme events, wave overtopping of the frontal dune could become an issue. The development platform will be set above the ARI 100 year level The effect of a direct hit severe cyclone on beach erosion and bite will be considered for emergency management planning. Facilities proposed behind the frontal dune will be designed to allow for wave overtopping and greater freeboard provided. The development will be designed to avoid any significant change in the dynamics of the creek entrance and adjacent shoreline. The frequency of creek mouth closure affects creek water quality and flushing as well as coastal erosion and creek mouth delta sand dynamics will be considered.

Climate change and sea level rise impacts will be assessed.

Emergency management catering for up to extreme cyclones will be incorporated into the design, with early evacuation but with a back-up safe refuge in place strategy.

6.3 Natural environment

The conceptual design of the project has been informed by the Environmental Analysis and involves:

- protecting areas with mapped values,
- reinforcing edges of natural vegetation and including buffer areas, and
- ensuring best-practice design in terms of matters that could impinge on downstream values (by, for example, degrading water quality).

Figure 9 shows the buffer areas adopted for concept design and as initial input to the EIS process. At this stage the buffers provided have been based on general ecological principles and do not necessarily conform to statutory buffers under Queensland legislation although this has guided their selection. A detailed analysis of ecological needs and statutory buffers will be addressed in the EIS.

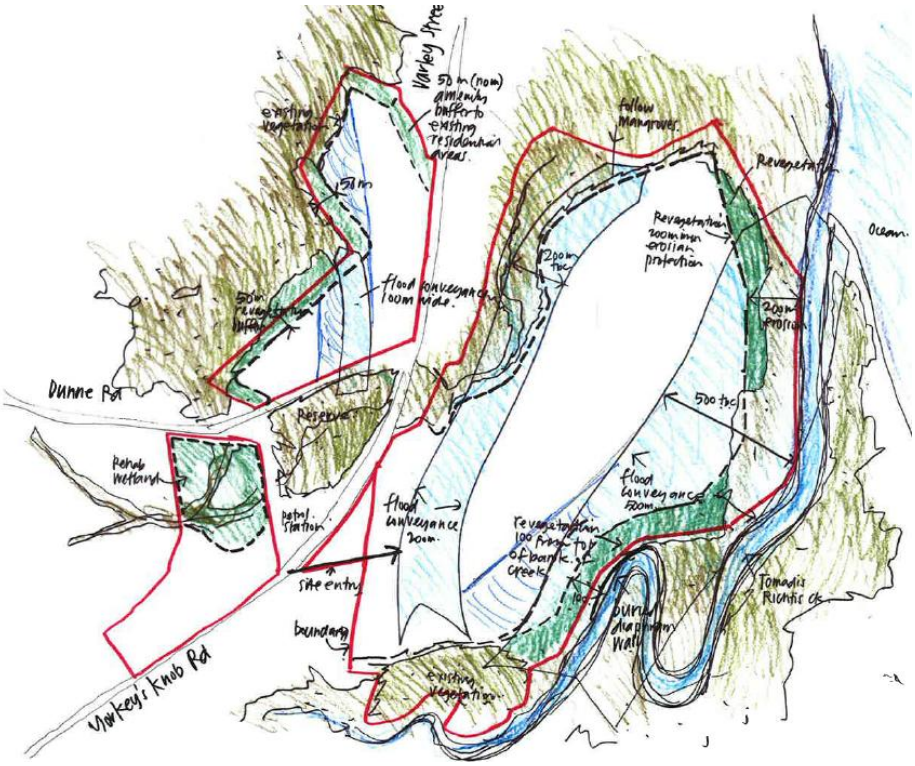


Figure 9 Concept Buffer Design.

6.3.1 Change of Land use – Agricultural to Tourism

The site is currently a sugar cane farm. The cleared areas are designated as Strategic Cropping Land under SPP 1/12 Protection of Queensland strategic cropping land.

An assessment of the potential for land use conflict will be carried out as part of the EIS, addressing the overriding need (for the development) in terms of benefit to the community. Refer to Sections 5.0 and 8.0 of this IAS. Investigations will follow the procedures set out in the planning guideline that was originally produced in conjunction SPP 1/92 Good Quality Agricultural Land.

6.3.2 Flooding

The key potential environmental impact that has influenced the concept design of the proposal is its flooding constraints and the need to maintain flows, volume and safety across the site without adverse affects such as increasing flood heights, diversion or concentration of flows on neighbouring properties.

The potential flooding impacts are:

- Flood depth of 2 to 3 metres over the entire site in the 1% AEP (100 year ARI) flood event.
- Major flow path carrying up to 40% of Barron River bank-full flows down Thomatis-Richters Creek.
- The site provides considerable flood storage in a significant flood event and flood storage is to be maintained with development of the site.
- The site conveys significant flood flows from south to north and this conveyance capacity needs to be maintained with any development of the site.
- Yorkeys Knob Road has less than ARI 5 year immunity and the Captain Cook Highway has less than 20 year immunity. Hence, site access via road is not possible on a relatively frequent basis, unless Yorkeys Knob Road is upgraded. Any upgrade will be required to avoid adverse impacts on neighbouring properties though the use of causeways, culverts or bridge works.
- Minimum development platform levels for hotels and critical services and infrastructure need to be at least 300mm above the 1% AEP (ARI 100 year) flood level. This will require elevation of platforms by 2 to 3.5m above the existing farm ground levels.
- Because of the large flow rates and volumes flowing across the site in major flood events, development would be best suited to a streamlined shape parallel to the flow.
- Because of isolation during flood events, consideration needs to be given to events more extreme than the 1% event and for emergency flood management planning, for event up to the PMF, which is up to 6 metres above the existing farm ground levels.
- Safe flood refuge may be provided within a multi-storey hotel complex, with emergency management facilities provided.

6.3.3 Geotechnical, Groundwater and Acid Sulfate Soils

Settlement of soft compressible clays will occur due to imposed loads from filling or building foundations. The impacts of settlement will need to be mitigated by avoiding soft clay areas or through conventional ground improvement techniques including:

- Preloading
- Surcharging
- Removal and replacement of soft materials (typically for lightly loaded structures including building of up to 2 storeys)

The unconsolidated alluvial materials are unlikely to provide foundation support for buildings of more than 2 storeys. Piled foundations are likely to be required to support most buildings on this site. Piles will need to be founded within the underlying older alluvium.

Unsupported batter slopes of excavations (including lakes and water features) and fill slopes will need to be evaluated for stability. Based on experience with these alluvial materials, the following slope angles could be adopted for initial planning purposes:

- Lake revetments 1:4 (V:H)
- Fill batters generally up to 2m 1:2 (V:H)

Further investigation and assessment will be required to confirm suitable unsupported slope angles to maintain stability. Supported slopes or engineered retention structures could also be adopted as an alternative to unsupported slopes.

In terms of groundwater the development area sits directly above the zone where the salt/fresh water interface occurs. Large excavations, such as lakes, may result in the following impacts:

- Change of salinity levels within the groundwater system causing impact to adjacent environments.
- Alteration of the underground and surface hydrology in near tidal areas.

The magnitude and severity of such impacts will be evaluated by further investigation and modelling. These impacts can be mitigated using measures including restricting the location and scale of excavations, controlling lake water levels to prevent drawdown and/or outflows into surrounding area, or adoption of lined water holding bodies.

Excavations resulting in mixing between the upper and lower aquifer may also result in a deterioration of water quality. Avoidance of excavations into the older alluvium would prevent this impact. Further investigation and modelling will be undertaken during the EIS to assess engineered mitigation measures.

The uncontrolled disturbance of ASS may result in the generation of sulfuric acid. This may occur when excavated soils are exposed to the air and insitu when groundwater dewatering allows air to enter the soil matrix. This is a management issue during the earthwork stages of the project.

6.3.4 Water Quality

The potential (i.e. un-mitigated) effects of the project on surface water quality of the immediate receiving waters (essentially Richters, Yorkeys, and Half Moon Creeks) are likely to arise from construction and normal operational activities such as:

- pollution of stormwater drainage (suspended solids, nutrients, gross pollutants, hydrocarbons from accidental spills of fuel etc.),
- discharge of water from the “moat” (a system of artificial waterways required for management of hydraulics) if a closed system is not adopted,
- discharge of water from other elements (e.g. the Aquarium and Water Park) – any intentional discharges will be to sewer and accidental / emergency discharges will be addressed by design,
- runoff from the Golf Course (principally nutrients), and
- contamination of flood waters during construction and operation.

With respect to groundwater, impacts could include:

- construction impacts arising from acid sulfate soils,
- mixing of aquifers (see above for moat system), and
- contamination arising from burst sewers and pumping station overflows.

These are all amenable to mitigation by design and management. It is not possible at this stage to predict the effect of the project on water quality on the nearby creeks and

the GBR lagoon as details are not sufficiently developed. However, as described below, best-practice management can be expected to deliver improvements in water quality compared with the existing situation.

6.3.5 Ecological Processes

This following assessment assumes that environmental mitigation principles and buffers are adopted:

- Connectivity of habitats (terrestrial connectivity). All existing terrestrial connections are proposed to be maintained and enhanced. On this basis there will be a net beneficial impact on terrestrial connectivity. This benefit will accrue not only within the site but also upstream (i.e. Cattana Wetlands) and downstream (i.e. the two FHAs and the GBRWHA/Marine Parks).
- Unrestricted watercourses that permit the free movement of aquatic fauna (aquatic connectivity). All existing aquatic connections are proposed to be maintained and enhanced. On this basis there will be a net beneficial impact on aquatic connectivity. As above, this will enhance site and off-site values.
- Absence of pollution of surface and groundwater (water quality). At this stage the impact on the quality of surface water and groundwater is unknown. Detailed design will be required to develop appropriate management and mitigation strategies to protect water quality. It is likely that there will be a net beneficial impact on surface water quality (via application of Water Sensitive Urban Design SUD principles) and no adverse impact on groundwater quality. Possible contamination of floodwaters during construction and operation will require assessment in the EIS.

All ecological features present on the site are proposed to be maintained and enhanced by the proposed buffers. These buffers and the ecological enhancement works can be expected to ensure that the ecological features adjacent and downstream of the site are protected in terms of ecological function as described above. Management of groundwater will be required (principally to prevent contamination by acid sulfate soil and undesirable mixing of aquifers).

On this basis there will be a net beneficial impact on on-site and adjacent ecological features. It is expected that there will be little or no adverse impact on the adjacent FHAs, the GBR Coast Marine Park, the GBRWHA, and the GBRMP. Ensuring that this remains the case is a project objective.

6.3.6 Flora and Fauna

With the exception of possible clearing for access and services, all native flora on site is proposed to be maintained by the preservation of areas of existing natural vegetation and enhanced by appropriate planting of buffer areas as noted above. On this basis there will be a net beneficial impact on on-site and adjacent flora.

The protection and enhancement of areas of existing natural vegetation will also protect and enhance available fauna habitat. This will involve a net beneficial impact on on-site and adjacent fauna habitat that will thus benefit native fauna.

However, the development and increased human population could adversely impact on native fauna through noise and light emissions, road-kill, and a range of other human/animal interactions. Domestic animals are unlikely to be an issue.

Lighting may be an issue for nocturnal species. For example, turtles are known to nest on Yorkeys Beach and the impact of the project on these and other nocturnal species will need further attention during detailed design and in the EIS.

6.4 Amenity—including noise, air quality, vibration, lighting, urban design and visual aesthetics

Air Quality: The project is not expected to have a significant adverse impact on air quality although the construction process will require careful management to reduce dust emissions.

Smoke, dust and other air emissions together comprise one of the issues covered under CairnsPlan's *Operational Aspects of the Cairns International Airport Code* which will apply to the project.

Greenhouse gas emissions of the construction and operation phases will be considerable and sustainability criteria will be investigated during the EIS to limit these.

Noise and Vibration: Various noise sensitive receptors (as defined by Queensland legislation) occur in the vicinity of the site and include residential premises of the communities of Yorkeys Knob and Holloways Beach. Environmental (biodiversity) receptors include the Cattana Wetlands and the Park & Recreation Reserve (Lot 126 NR5009) located in the broad centre of the parcel of properties that comprise the site.

Vibration (arising from pile-driving and bulk earthworks) is unlikely to be a consideration other than on Lot 60 RP835486 as (with this exception) the site is remote from sensitive receptors. The Water Park is proposed to be located on this lot and vibration associated with pile-driving could create nuisance. Construction noise and vibration is likely to be significant at some stages and is one of the environmental elements to be dealt with under the recommended EMP (Construction).

Once the project is constructed it can be expected that operational vibration will be minimal and noise will be limited to extra traffic to and from the various precincts of the project, and outdoor recreational and entertainment areas (waterpark, pools, playgrounds, etc.).

Lighting: At this stage it is not known what lighting will be incorporated in the design. Lighting is one of the issues covered under CairnsPlan's *Operational Aspects of the Cairns International Airport Code* which will apply to the project. The associated Overlay Map sets out allowable maximum intensity of illumination for designated zones.

In addition to the airport issues, careful consideration of lighting will be an important part of the visual assessment and ecological assessment to be undertaken in the EIS.

Visual Aesthetics: It is expected that the development will involve a major change in the visual setting of the land. It will involve a shift from a rural to highly developed resort-style land use characterised by large buildings and other features that will be unavoidably visually prominent. Large parts of the site (particularly around the edges of all lots in the parcel) will remain covered with natural vegetation and extensive additional plantings will be involved to reinforce this vegetation. This will help screen the lower parts of the development but the larger buildings will remain visible.

The development is expected to be highly visible from near and distant vantage points as well as ships at sea and from the air. Whether this visual prominence is of concern and whether or not the buildings themselves are aesthetically pleasing will be a matter of the opinion of individual observers.

The EIS process will involve consideration of architectural design and the broader issues of visual absorption and impact such as are routinely addressed in a visual impact assessment.

6.5 Social environment—beneficial and adverse potential impacts

The social impact assessment for the project and the nature and extent of the community consultation program will be described and a summary of the results incorporated in the EIS.

A Social Impact Assessment Framework, developed by The Cairns Institute, identifies key themes for the social assessment of the proposal. These are summarised in Table 3 below, including potential positive and negative impacts of each impact.

TABLE 3 – POTENTIAL SOCIAL IMPACTS – POSITIVE AND NEGATIVE

Impact Category	Potential positive impacts	Potential negative Impacts
Regional infrastructure	Enhanced facilities for local community. Trigger for new infrastructure development.	Competition between visitors and locals for local infrastructure
Housing and accommodation	Creates opportunity for local builders. Encourages investment in new rental stock.	Drive up house and rental prices in immediate area, Increased need for social housing.
Airport	New routes, facilities/jobs. Increased General Aviation/support.	Increased noise from flights over northern beaches.
Human services impact and regional services	Wider range of improved regional services for locals as population base increases.	Pressure on Govt. CRC and Not for Profit Agencies for support services for low income clients.
Regional economic impacts	Significant economic injection in construction and operations phases. Major new employment driver. Potential wider regional employment opportunities.	Increases economic dependence of tourism. Loss of agricultural production from the site
Regional employment	Increased jobs, more career opportunities for progression in region, higher retention of school leavers.	Large number of low skilled jobs, Seasonality of regional employment could become more pronounced.
Skills and education	Enhance region's skills base. Opportunity for business and hospitality training at TAFE and James Cook University.	Outside labour brought in if region cannot generate required skills. Local skills shortages.
Business, retail and	New businesses opportunities,	Outside or corporate investors move in and buy up local

commercial	expansion of existing businesses	business. Pressure on commercial/ industrial space.
Cultural impacts	Enrich local community's cultural scene, opportunities for local business, culture, art/ entertainment.	Locals feel alienated via increased migration. Potential for segregated communities.
Regionally significant retail and amenities	New activities for regional community. Generate demand for new regional shopping centres, attracts new retail businesses leading to greater choice and lower prices for locals.	Possible adverse impact on existing businesses. Unplanned pressures on land use and consequent infrastructure. Alienation of small businesses.
Major and high rise development next to a village, based in the flood plain and visible from the ocean.	Could create new visual icon the compliments/ enhances Marlin Coast values. Associated engineering works (road and flood mitigation) may improve local flood immunity.	Inconsistent with current planning norms and cultural preferences. Increased lighting.
Internal view out.	Enhanced by vegetation renewal.	Changed local landscape.
Tropical design environmental sustainability	New technologies and design, encourage local community to adopt new technologies.	Depending on design could create a non-representative node and community isolated from the landscape.
Environmental issues & landscape restoration/ context	Potential for environmental regeneration including riparian corridors and floodplain enhancement.	Noise from vehicles and lighting, loss of natural amenity and changed aesthetics of area, visual impact from ocean and from ridgelines
Traffic	Trigger for new arterials with less congestion in Nth Beaches. Flood proofing of will assist community.	Peak hour delays, large number of heavy truck movements during construction, increased congestion
Jobs	Decrease in regional unemployment level, new career paths with a more pyramid shape management structure. New categories of jobs/ careers. Opportunities for local contractors.	Large number of low end jobs Attraction of out of area low skill workers/ contractors will create housing issues. Housing of new workers during construction.
Poor visuals & noise	A new iconic structure in longer term.	
Perceptions of high end casino culture	Increase spending in Cairns region, new jobs. Opportunity for new post secondary training, increased revenue for CRC, more competitive in convention business leading to	Criminal linkages, increase in prostitution, increase in drug use and availability, entry of organised crime links..

	jobs.	
Problem gambling	Increased resources to deal with problem gambling and flow on social impact.	Public health issues including depression, anxiety, substance use disorders and nicotine dependence. Absenteeism Domestic violence. Vulnerable group impacts.
Potential casino related crime	Often not a problem in the first few years	Potential increase over time.
Wider urban development pressure on Barron Delta cane production and Local loss of farming land	Reduced industrial traffic in harvest. Reduced nitrogen to GBR.	Redundancy in local tramways. Agricultural and service industry job losses. Minor job losses
Infrastructure & commercial activities	Increase accessibility to Smithfield/JCU/Cairns.	Big business taking out locals.
Local amenities and services.	Improved quality and supply. Employment & education opportunities	Loss of local amenity and village level services.
Minor property & personal crime	More police services	Local perceptions of changing risks and security.
Cultural impacts	Cultural heritage protection/ enhancement. Wider cultural recognition. Site access Cultural enhancement via employment in interpretation.	Possible destruction of significant sites and artefacts. Loss of cultural knowledge. Site access decreases.
Opportunities	Commercial and employment opportunities.	Employment marginalisation. Population mix changes. Alcohol/ gambling impacts.
Employment Within the Project/ Development	Strong project employment.	Marginalised from internal employment.

6.6 Economic effects

Both during construction, and once operational, Aquis Resort at The Great Barrier Reef will provide substantial economic stimulus to North Queensland. KPMG have modelled the financial benefits to North Queensland to an extent which shows that Aquis Resort at The Great Barrier Reef is a vital element in the future prosperity and economic sustainability of the region.

The p0rject will involve:

- direct expenditure during construction of in the order of $4.2B in current day expense terms;
- significantly increasing annual Gross State Product during construction;
- increasing annual Gross State Product once operating;
- increasing, on an ongoing and sustainable basis, revenues to State Government from payroll tax, Federal Government GST remission and significant gaming tax and fees once operating.

These factors show the substantial and direct economic benefit to North Queensland from Aquis, and which will only steadily increase in future years. Such benefit is real and sustainable. Whilst not part of the KPMG modelling it is fair to assume that with a significant increase in employment comes other indirect benefits of an economic nature to the local community, such as increased property values driven by greater rental demand in the areas surrounding the project.

Aquis Resort at The Great Barrier Reef will directly provide employment, and indirectly provide the need for training and development of skills, at a level never before seen in North Queensland. This need for training and skills will drive the educational and vocational institutions in North Queensland to new levels of expertise, business acumen and pursuit of opportunity. North Queensland currently experiences a cyclical state of employment with the 'high season' bottoming out as the seasons change and tourism fades. Aquis Resort at The Great Barrier Reef will bring a levelling of the seasons and demand will remain high all year round. Unemployment will likely be as low in North Queensland as anywhere in Australia as a direct consequence of the development of Aquis Resort at The Great Barrier Reef.

KPMG have established that:

- Aquis Resort at The Great Barrier Reef will create 16,600 jobs at peak construction (9,300 direct and 7,300 indirect)
- Aquis Resort at The Great Barrier Reef will create 26,700 jobs when fully operational (10,000 direct and 16,700 indirect)

Such outcomes make plain that:

- the issues relating to very high 'low season' unemployment in Cairns will become a thing of the past ;
- supplying the ongoing staffing of the resort means training programs for youth will need to be developed through James Cook University and other local tertiary institutions, which will result in North Queensland becoming more integral tertiary education provider;
- there will be significant training and employment opportunities for indigenous youth; and
- Aquis Resort at The Great Barrier Reef will act as a form of risk mitigation to the likely resources boom deflation.

Aquis Resort at The Great Barrier Reef aims to be the catalyst for the rejuvenation of tourism and infrastructure development in North Queensland, delivering economic, social and environmental benefits to the region. Aquis will consider it a material signal of its success if the youth of North Queensland no longer feel the need to travel south or internationally for education, employment, culture and a vibrant, diversified and prosperous lifestyle. Relevantly, Aquis seeks to bond together all North Queensland

residents (indigenous and nonindigenous) in a common spirit of endeavour to grow together as a community using Aquis as a starting point for their ultimate benefit.

The Far North Regional Plan 2009-2031 highlights “Far North Queensland’s international reputation as a world-class destination for nature-based and sustainable tourism”. It objective, as stated in section 5.5 of the FNQRP is to maintain and enhance that reputation. Tourist attractions are to be developed that is of an appropriate scale for the locality; linked with the rural, ecological and resource values of the locality; and where located in areas of high ecological significance are to present and interpret the ecological values” allows for opportunities for economic diversification for rural landholders.”

In August 2012, the state government implemented a Temporary State Planning Policy – Planning for Propersity, specifically focussing on significant areas economic growth across Queensland.The policy highlights tourism as an important industry for the state when any regional level planning is being undertaken.

The policy states that “the State interests in economic growth include:-

“promoting tourism by:

a. protecting Queensland’s tourism attractions and significant natural assets, for the benefit and sustainability of the tourism industry;

b. facilitating tourism projects that complement local conditions; and

c. removing hurdles and locational limitations for appropriate tourism development.

Development for tourism is distinct from other development owing to the diversity of its type, size, location and impact. Tourism supports local and regional economies in urban and non-urban areas – providing opportunities for growth and employment.

Tourism provides resilience and diversity in local economies that may otherwise be dependent on a narrow economic base. Growth of the tourism industry will complement and balance rural pursuits and nature conservation activities.”

At the decision making stage on a development application, the purpose of this policy will be achieved by a balancing of competing or conflicting outcomes that gives additional weight to tourist development which can be shown to be complementary to an area’s environmental, scenic and cultural values.

6.7 Built environment

6.7.1 Water, Sewerage, Power, Telecommunications and Roads

Council planning for future trunk infrastructure has not considered development on this site or to this scale. The anticipated likely impacts resulting from the proposal include:

- Upgrade of the water main from Captain Cook Highway to Yorkeys Knob and network connections along Dunne Road;
- Trunk pumps stations to transport sewage to the Marlin Coast Wastewater Treatment Plant;
- Extension of HV Power from Captain Cook Highway to the site with associated power infrastructure;
- Upgrade to Local and state controlled road networks to accommodate generated traffic and transport demand

- Possible widening and upgrading of Yorkey's Knob Road from Captain Cook Highway to Dunne Road to reflect functional hierarchy and improve flood immunity.

6.7.2 Community Facilities

The proposal is located on cleared rural land outside the existing urban footprint of Yorkeys Knob and will not displace or replace existing community facilities. The proposal will provide additional activities, locations, facilities and programs that will be available to existing residents and visitors. The increased population that will be attracted to this area will have a flow-on effect by increasing the use of community amenities and facilities.

Community consultation during the preparation of the EIS may raise opportunities for social benefit and opportunities for the local area. The community may identify community facilities and programs that the proponent may support in the short, medium or longer term. These may range from community park upgrades, renewals or similar through a community grant program (similar to the current one run by Brothers club or the Reef Casino community grants), direct inputs or philanthropic support for research or academic programs of relevance to Cairns, the region and the tropics.

6.8 MNES under the EPBC Act

A referral to the Australian Government has not been made prior to the submission of this IAS to the Queensland Government, on the following basis:

- There is no proposed work involving the mouth of Thomatis/Richters Creek;
- Areas of ecological significance have been avoided;
- Buffer areas have been included to drainage channels and significant vegetation areas;
- Rehabilitation of natural areas containing significant and/or degraded ecological communities is proposed to maintain and improve the area's natural functions and amenity. This may be based on the Queensland Government's Environmental Policy in relation to offsets; and.
- Water quality measure are to be designed and implemented to ensure no there is no reduction in water quality entering the creeks, mangroves and ultimately the waters of the Great Barrier Reef.

On this basis, the project is considered to be unlikely to involve a controlled action. Environmental studies in response to Terms of Reference for the Queensland EIS will include consideration of Matters of NES.

Detailed consideration will be given be given to Matters of NES and measures developed to avoid and/or mitigate impacts.

The proponent will refer the project to SEWPaC prior to construction commencing when environmental assessments have been completed and all relevant information is available.

7.0 ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURES

The overarching management of potential impacts identified in Section 6 above will be addressed through the preparation of a suite of Management Strategies and EMP Plans during the three stages - planning, construction and operation.

The EMPs will be developed in consultation with relevant agencies and within the framework of AS/NZS ISO 14001:1996 'Environmental management systems – Requirements' and will manage and control the works to ensure that all environmental aspects for the construction and operation phases of the project are addressed.

7.1 Environmental Management

Planning – during the Planning Phase (i.e. as part of the preparation of the EIS):

- consider all avoidance and mitigation principles described previously (expanded as required to address identified values and possible impacting processes) – this is essentially "mitigation by design",
- develop an Environmental Management Plan (EMP (Planning)) that provides guidance for impact mitigation through the (post-approval) detailed design, construction, and operation phases (it is expected that a number of *Environmental Management Strategies* will be developed to document all actions required to protect the values under consideration in an holistic and integrated manner), and
- consider necessary offsets for impact that cannot be otherwise satisfactorily addressed (see below).

Detailed Design – during the Detailed Design Phase:

- address all measures specified in the EMP (Planning) and as required by approval conditions,
- continue to seek mitigation outcomes as detailed design develops,
- develop and implement appropriate *Environmental Management Strategies* that bring together all required design, construction and operational actions for key issues (e.g. water quality, flood response) and develop the associated detailed management plans,
- include all required Construction Phase management actions in contract documents, and in particular require that all contractors develop a detailed EMP (Construction) to set out all controls required to protect the identified values (all reputable contractors have systems in place for this and standard plans can readily be adapted for project- and site-specific environmental management needs), and
- consider all required Operation Phase management actions and specify in relevant contract documents and operational procedures.

Construction – during the Construction Phase:

- require all contractors to adopt all of the required Construction Phase management actions developed during the Planning Phase as described above by complying with contract requirements and implementing their EMP (Construction) including monitoring and emergency plans, and
- provide a comprehensive on-site management system including monitoring, pre-planned responses and contingency plans.

Operation – adopt all of the required Operation Phase management actions developed during the Planning Phase as described above and as expanded on during the EIS and detailed design (details to be determined for management of matters such as maintenance of water quality, maintenance and management of revegetated areas, protection of native fauna, and protection of aircraft operations).

A further principal management tool involves the development of a suite of Environmental Management Strategies. These are proposed to include a framework for an integrated and coordinated approach to protect the value under question during design, construction, and operation as appropriate. Identified strategies described below are (listed alphabetically):

- Acid Sulfate Soil Management Strategy,
- Aircraft Safety Strategy,
- Contingency Strategy (to address all relevant construction and operation risks and in particular flooding),
- Fauna Management Strategy,
- Landscape and Habitat Strategy,
- Sustainability Strategy, and
- Water Quality Management Strategy (surface water and groundwater).

Finally, the Queensland Government Environmental Offsets Policy (QGEOP) (EPA 2008) includes two relevant offsets policies that could apply to the project, namely the Biodiversity Offsets Policy (DERM 2011) and the Marine Fish Habitat Offset Policy (DAFF 2012). These will be explored in detail in the EIS. The need to provide offsets is only triggered when there are residual impacts (i.e. after mitigation is taken into account) from a development.

7.1.1 Acid Sulfate Soils Management

Detailed investigation and development of an ASS management plan will be required for this project. The ASS Management Strategy will have the following objectives for the construction and operation phases:

- Avoiding disturbance of clayey deposits (with higher acid generating potential).
- Limiting the time of soil stockpiling prior to treatment.
- Limiting the time and extent of groundwater drawdown.
- Monitoring ground and surface water quality and water treatment where required.

7.2 Built environment

7.2.1 Flooding

In order to address the identified flooding impacts on the land, the following design principles have been adopted for the concept planning of the development:

- Minimum development platform levels for hotels and critical services and infrastructure o be at least 300mm above the 1% AEP (ARI 100 year) flood level. (elevation of platforms by 2 to 3.5m above the existing farm ground levels).
- Development to a streamlined shape parallel to the flow (to allow flood flow rates and volumes to pass across the site in major flood events) without impacts on adjoining properties.

- Planning for emergency flood management based on the the PMF for the site (up to 6 metres above the existing farm ground levels).
- Safe flood refuge within the multi-storey hotel complex, with emergency management facilities provided.

7.2.2 Emergency Flood Management (part of Risk and Hazard Management)

Key elements to be considered and incorporated into an Emergency Flood Management Plan include:

- Early evacuation/evacuation routes by road or other means
- Adequate warning times (6 hours minimum)
- Upgrade of Yorkeys Knob Road
- Safe Refuge incorporated (Shelter in place)
- Emergency Medical Evacuation procedures
- Emergency site facilities (Water supply, power, communication, medical supplies, food and shelter)
-

7.2.3 Water, Sewerage, Power, Telecommunications and Roads

- Upgrade of trunk water mains to meet the demands imposed by the development and ensure no loss of level of service being provided to existing community.
- Upgrade of trunk sewerage network including additional pump stations and rising mains.
- Connection to the National Broadband Network. (NBN is scheduled for Yorkeys Knob by 2015).
- Extension of HV Power supply to the site with associated electrical infrastructure on site.
- Upgrade of the local and state controlled road network to cater for the traffic generation and transport demands generated by the proposal

7.3 Cultural heritage management plan (Indigenous)

Construction impacts on Indigenous cultural heritage values will be included in the EMP (Construction). The need for a formal Cultural Heritage Management Plan with the Djabugay people will be explored during the EIS.

7.4 Non-Indigenous cultural heritage management

The EIS will include research, investigation and identification of any additional sites (additional to the Old Innisfail Courthouse). This will include antedotal assessment of the current condition of the site(s) and recommendations in each case. Inclusion of community based programs or actions as part of the community consultation with the community (focussed on the Yorkeys Knob area), will be part of this research.

7.5 Social Impact Mitigation

The proposal could open up significant new opportunities for development but also create the potential for ‘push back’ from some sectors or community members. Managing this requires both structured engagement and open information flows.

Associated engagement about the opportunities need to be able to contribute to community debate in a structured and well managed way.

The project will also act as a catalyst for follow-on development of private housing, commercial precincts and other development, potentially becoming the catalyst for significant master planning in the Barron Delta and Northern Beaches and major transport planning to the south of Cairns. Ideally, such things need to be managed in partnership with the State and CRC and in a manner that avoids decision making bottlenecks in approvals and infrastructure provision.

Table 4 below sets out possible avoidance and mitigation approaches in relation to regional and local communities' social values in relation to this proposal.

TABLE 4 – SOCIAL IMPACT AVOIDANCE AND MITIGATION MEASURES AND RESOURCES

Impact Category	Possible avoidance & mitigation approaches	Potential resources
Regional infrastructure	Early infrastructure planning partnerships. Agreed cost sharing mechanisms for infrastructure to be developed and used by project. Infrastructure Charges contributions ot trunk infrastructure upgrades	Department of Transport and Main Roads (DTMR) CRC Asset Plans. Cairns Public Transport Strategy. Construction Industry Cluster.
Housing and accommodation	Proactive CRC planning to open new land in parallel with construction and initial operation. Encourage new investment in rental stock that parallels increase in demand.	Cairns Plan. CRC, Developers State and Federal Agencies. Construction Industry Cluster.
Airport	Scheduling of airline movements. Enhanced Airport Planning.	Cairns Airport Plan. China Flights Strategy.
Human services impact and regional services	Raise human service sector capacity and planning to ensure the vulnerable have ready access to required services.	Appropriate State and Federal agencies, RDA, CRC, Cairns HS Alliance.
Regional economic impacts	Supporting major impetus for building a stronger knowledge-based economy. Supports industry adjustment (e.g. strategic development of agriculture in the south and new spin off clusters in energy and tropical design.	Advance Cairns, Regional Development Australia.
Regional employment	Upskilling of current workforce, develop new training/ education infr. to attract students.	JCU, TAFE, Qld Dept of Ed, Catholic Ed, Centrelink,.
Skills and education	Work with region's education sector to develop a training plan to cover skills requirements.	Regional education providers.

Business, retail and commercial	Partnerships with Chamber of Commerce, Advance Cairns to enhance business outcomes. Master planning in Barron Delta and Northern Beaches.	Chamber of Commerce, Advance Cairns. Cairns Plan.
Cultural impacts	Early partnerships with local Chinese and wider community. Significant public information delivery.	CRC, local Chinese community.
Regionally significant retail and amenities	Master planning in Barron Delta and Northern Beaches.	CairnsPlan - CRC DSDIP.
Major and high rise development next to a village, based in the flood plain and visible from the ocean.	Major public information and input into design phase. Master Planning in the Barron Delta and Northern Beaches. Serious consideration of risk management standards and flood mitigation strategies. Well-structured insurance and asset management frameworks to limit exposure to State Govt. and Council.	Cairns Plan. CRC, JCU, State agencies
Internal view out.	Significant attention to internal tropical design and appropriate screening. Major public information and input into design phase. Master Planning in the Barron Delta and Northern Beaches.	Cairns Plan. Tropical Green Build Cluster.
Tropical design environmental sustainability	Significant attention to internal tropical design. Major public information and input into design phase. Master Planning in the Barron Delta and Northern Beaches.	Cairns Plan. Tropical Green Build Cluster.
Environmental issues & landscape restoration/ context	Noise reduction planning, building codes, ensure tie in with environmental assessment, including strong focus on energy/water use. Early exploration of potential for development to kick start major partnerships in regionally significant floodplain recreation and environmental precinct, including strong environmental and connectivity improvements to coastline, Lake Placid, Cattana Wetlands and JCU. Effective integration of environmental programs with JCU course curriculum.	BRICMA/ Terrain. JCU CRC. Regional NRM Plan. Northern Beaches Biodiversity Studies.

Traffic	Master Planning in the Barron Delta and Northern Beaches.	Cairns Plan, DTMR & CRC.
Jobs	Local based training to focus on career progression skills. Early partnering with CCoC and Advance Cairns and clusters of interests associated with construction.	Chamber of Commerce Advance Cairns LEC QITE Centrelink
Poor visuals & noise	Effective development scheduling/ timing. Effective screening and traffic management.	Cairns Regional Council,DTMR
Perceptions of high end casino culture	Early, cohesive and evidence-based partnerships between developer, QP and AFP services and CRC. Posting of specialist state and federal law enforcement officials.	QP/AFP. CRC, TTNQ
Problem gambling	Early, cohesive and evidence-based partnerships between developer and Cairns HS Alliance and CRC. Regulation of problem gamblers by Casino Self-exclusion Policies.	Centacare QDoCs Relationships Australia Gambling Help Services WuChopperin Lifeline
Potential casino related crime	Early, cohesive and evidence-based partnerships between developer, QP and AFP services and CRC.	Police and Corrective Services.
Wider urban development pressure on Barron Delta cane production	Support regional approach to land available/infrastructure. Master Planning in Barron Delta/ Northern Beaches to avoid uncoordinated land use change.	Mill District Data. Cairns Public Transport Study.
Local Loss of Farming Land	Local farm negotiations of required changes in local harvest transport arrangements.	Mulgrave Mill and Canegrowers.
Infrastructure & commercial activities	Local Community Reference Group processes. Inclusive tendering for outlets provided by development.	Local knowledge & businesses. CRC. Local Councillors.
Local amenities and services.	Local Community Reference Group processes. Major public information and input into design and operational phases. Master Planning in the Barron Delta and Northern Beaches.	Local knowledge & businesses. CRC. Local Councillors. JCU TAFE Religious institutions

		.
Minor property & personal crime	Local Community Reference Group processes. More police surveillance Better technology solutions.	State Government Private security firms. JCU.
Alcohol, drugs, prostitution	Local Community Reference Group processes. Improved regulation, services/meditative spaces.	Local support groups
Cultural impacts	Effective engagement, site mapping and cultural heritage protection. Exploring cultural stories/ opportunities within emerging development.	NQLC Claim Material. DEHP Data Base JCU (CI)
Opportunities	Structured engagement and associated plan/ agreement for maximising traditional owner benefits.	Traditional Owners Groups DATSIP RAPA JCU
Employment Within the Project/ Development	Structured engagement and active Indigenous Employment Strategies.	Traditional Owner Groups DATSIP

7.6 Greenhouse gas management plan

Greenhouse gas emissions is just one of a number of sustainability issues that will need to be addressed in the EIS. It is proposed to prepare a Sustainability Strategy to address issues such as energy, water, ecoefficiency, greenhouse gas emissions and climate change.

7.7 Waste management

Waste generated during construction and operations of the development with be subject to detailed consideration during the EIS process and a comprehensive Water Management Strategy will be developed to inform the Waste Management Plans for construction and operations.

7.8 Hazard and risk, and health and safety

Project Hazards and Risks will be identified and managed through a structured process of risk management.

The Hazard /Health and Safety risk management regime will form a sub-set of a whole of project risk management process that will also encompass such risk groups as technical risk, design risk, construction risk, environmental risk, financial risk, community risk and political risk to name a few.

The risk management regime will focus on the construction and operational phases of the project and will be considered and ranked in the context of:

- the severity of the risk,
- likelihood of the risk,
- the consequences of the risk transpiring
- risk mitigation option and the cost of the options
- effectiveness of the mitigation treatments

Risk identification and management for each of the risk groups will fall under the responsibility of the technical reference groups established for the preparation of the EIS and subsequent design processes. The risk and hazard identification an management process will be a dynamic and ongoing regime that will be regularly maintained and updated by the technical reference groups through a process of workshopping and issues identification. The risk management regime overall will be managed by a dedicated Risk Manager whom will be responsible for ensuring the risk management processes are undertaken and for the coordination and integration of risks across the reference groups.

7.9 Climate Change

Consideration of climate change (and in particular increased intensity and frequency of tropical cyclones and elevated sea levels) will be required during the EIS in a number of areas. The most important of these changes is the likelihood of higher flood levels and storm surge. The best predictions of these effects will be used to inform hydraulic modelling for design and emergency management responses.

8.0 APPROVALS REQUIRED FOR THE PROJECT

Approvals for the proposed development at Yorkeys Knob relate to Commonwealth, State and local government legislation. The EPBC Act, SDPWO Act and the SPA Act are relevant for the land use approval of the proposal. Subsequent to approval Operational Works and Environmentally Relevant Activity approvals will be needed.

8.1 Development Approval – SDPWO to Assessment Manager Approval

Steps in the Environmental Impact Assessment conducted under this Act are typically:

- Proponent prepares and submits an Initial Advice Statement (this document).
- The Coordinator-General considers the project against the criteria for a Coordinated Project and advises it decision.
- Draft Terms of Reference for the EIS are prepared by the Coordinator-General's office for consideration by State Agencies, Council and the community.
- Terms of Reference are finalised.
- The proponent prepares an EIS 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 provided to all relevant State and local Government agencies and the community
- Comments from members of the public and agencies are submitted to Coordinator-General.
- The Coordinator-General considers all comments received on the EIS and may direct the proponent to provide further information (as considered necessary).
- If required the proponent prepares and submits a Supplementary EIS (SEIS) addressing matters raised in comments on the EIS (as requested).
- The SEIS is distributed to referral agencies and registered submitters who are requested to submit final comments 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 are to be attached to the project and subsequent development approvals. This COG Report is issued to the Assessment Manager (Cairns Regional Council) and the proponent.

8.2 Sustainable Planning Act 2009

The Sustainable Planning Act 2009 (SPA) is Queensland State Government legislation, implemented by Local Government.

In accordance with Division 4, Section 36 and 37 of the SDPWO Act, where a development requires an application for development approval under SPA, the Coordinator-General's report on the EIS for the Project is provided to the Assessment Manager. The Integrated Development Assessment processes of information, referral and notification stages do not apply.

Further, a properly made submission about the EIS is taken to be a properly made submission about the application and the Coordinator-General's report is taken to be a concurrence agency's response for the application.

8.3 Queensland Government Environmental Offsets Policy (QGEOP)

The Queensland Government Environmental Offsets Policy (QGEOP) (EPA 2008) includes two relevant offsets policies that could apply to the project, namely:

- the Biodiversity Offsets Policy (DERM 2011), and
- the Marine Fish Habitat Offset Policy (DAFF 2012).

These will be explored in detail in the EIS. The need to provide offsets is only triggered when there are residual impacts (i.e. after mitigation is taken into account) from a development.

8.4 Environment Protection and Biodiversity Conservation Act - Commonwealth Government

At the time of preparing this IAS, the proponent has assessed that a referral the Federal Minister for Environment under the Environmental Protection and Biodiversity Conservation Act (Cwth) is premature.

The 'action' of developing this site in accordance with the research, development principles and concept plan is not likely to have a significant impact on any matters of national environmental significance. This initial assessment has been based on careful planning of the development to concept plan stage incorporating appropriate site selection for the location of buildings and activities, master planning of the site to avoid or mitigate known environmental issues (flooding, coastal processes, vegetation), the timing of construction and operation of those activities as they relate to the adjoining and adjacent areas and the development principle of maintain and enhance for the overall proposal.

During the EIS process the management and mitigation measures process will continually be tested against MNES and provisions of the EPBC Act. Should the proponent decide that referral to SEWPaC is required, it will be prepared and submitted under that legislation prior to construction commencing.

The Commonwealth Government also has an environmental offsets policy (SEWPaC 2012) that relates to the EPBC Act.

8.5 Great Barrier Reef Marine Park Act 1975

This Act establishes the Great Barrier Reef Marine Park Authority (GBRMPA), its functions and powers. It also establishes the Marine Park's territories and zones, offences under the Act, penalties and process for prosecution. As this Act applies to acts, omissions, matters and things in the "Australian jurisdiction" (including on land), it applies to this Project. Consultation with GBRMPA to discuss the Project, its details and designs will be undertaken during preparation of the EIS.

The agenda for this consultation will include an overview of the Project's existing environment, its potential impacts and possible management strategies on matters of relevance to the Marine Park and the Authority. No access or opening from the site to the ocean or to the waters of the Great Barrier Reef Marine Park is proposed. It is anticipated that the planning, design, construction and operation principles outlined in Section 7 will address identified values and actions associated with the project.

8.6 Other Approvals

A review of other applicable legislative requirements is provided in the Table 5 below.

TABLE 5: LEGISLATIVE REQUIREMENTS

Legislation	Policy Approval	Requirements Applicable to Proposed Development
COMMONWEALTH		
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.	The site consists of freehold titles not subject to native Title..
STATE		
Vegetation Management Act 1999	Approval is required for the clearing of remnant native vegetation.	Remnant vegetation is present on the subject land 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 mayl be required.
Water Act 2000 *(IDAS approval)*	Approval would be required to conduct operational works that involve disturbance of the bed and banks of a stream if this is proposed. A water allocation is required to extract water from groundwater or surface waters.	Stormwater drainage outlets to Ricthers Creek may involve disturbance to the banks. There is no intention to extract water from aquifers or surface waters.

Aboriginal Cultural Heritage Act 2003 *(NON IDAS approval)*	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.	The Cultural Heritage Study for the EIS will investigate the site and its surrounds for cultural heritage material. 90% of the site is cleared, degraded cane farm. A CHMP is required as the project will undergo an Environmental Impact Assessment.
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)	If there is any proposed trimming and removal of mangroves, this will require Operational Works approval. Disturbance to mangroves is to be avoided as a "first principle" of design and construction of the proposal.
Environmental Protection Act 1994 and EP Regulation 2008 (IDAS Approval)	Development Approval for carrying out Environmentally Relevant Activities (ERAs)	Subject to detailed sign the Project may include Crude Oil and Petroleum Product Storage, concrete batching (during construction), vehicle repair workshop.
Transport Infrastructure Act 1994	Development not contiguous to a State-controlled road that exceeds the threshold must be referred to Main Roads.	Traffic studies are to be undertaken to determine likely traffic generation to and from the site and impacts on Captain Cook Highway.
Land Act 1994 (non –IDAS approval)	Land reservation; road opening or closing; leasing of land	Road access may require dedication of land as a road or closing of existing road reserve(s) within the subject site

Coastal Management and Protection Act 1993	Resource Allocation (non-IDAS Approval) Operational Works Development Permit for Tidal Works (IDAS Approval)	Required for any excavation of material from Creek. This is not currently proposed.
Strategic Cropping Land Act (EIS referral)	The Project will be assessed against the provisions of the Act.	The land is identified as Strategic Cropping Land under the Act..
Marine Parks Act 2004 (Non IDAS approval)	required to undertake works (eg construction of weirs, drainage pipe outlets and culverts, boardwalks, revetment walls, dredging etc) in an Estuarine Conservation Zone.	Works are permissible in this zone of the marine park when the scale of adverse environmental impacts are minor or insignificant in the context of the protection of the natural integrity and environmental values of the zone in which the development is proposed.
Queensland Coastal Plan 2012 (EIS referral)	Demonstrate compliance with policies set in the Management Plan.	Relevant policies have been identified and form the basis of design principles adopted for the site
Far North Queensland Regional Plan 2009-2031	Demonstrate consistency with the Plans regional vision and strategic directions.	Yorkeys Knob is located within the FNQRP area.
LOCAL		
Cairns Regional Council Planning Scheme	Site is included in the Rural 1 Planning Area within the Barron- Smithfield District.	EIS to address compliance with Desired Environmental Outcomes, Codes and Policies.
Development Permit for Operational Works.		Operational Works for Earthworks

9.0 COSTS AND BENEFITS SUMMARY

9.1 Local, state and national economies

The Queensland State economy will derive benefits from the proposed Aquis Resort at The Great Barrier Reef resort through:

- boosting the tourism portfolio of the State by adding a high–profile and high–quality resort–based attraction, complementing current attractions at Cairns, the Great Barrier Reef and coastal–based locations. The project will attract interstate and overseas visitors, and will increase the region's contribution to tourism Gross State Product (GSP). The Yorkeys Knob Integrated Resort will also be more accessible as a holiday destination due to the Cairns domestic and international airport and deep water marina berths close by;
- diversifying the Cairns Regional economy and adding a combination of tourism product to its tourism market;
- targeting relatively high unemployment in the region, including creating an estimated 17,000 jobs during construction and 26,000 jobs when operating; and
- providing an ongoing boost to local and State Government revenue, through rates, headworks charges, property transaction duties, land tax and payroll tax.

9.2 Natural and social environments

Table 6 summarises expected costs and benefits with respect to the natural environment.

TABLE 6: NATURAL ENVIRONMENT COSTS AND BENEFITS SUMMARY

VALUE	BENEFITS	COSTS
Climate	Nil.	Nil.
Land	Management of ASS that currently are largely un-managed.	Possible release of sediment and acid runoff (see Note 1).
Hydrology and hydraulics	Nil (a no net impact solution (afflux and velocity) is required for flood impacts).	Nil (a no net impact solution (afflux and velocity) is required for flood impacts).
Water quality	Improvement of stormwater drainage quality via use of WSUD techniques. Improvement in water quality of exiting watercourses through reinforcement of riparian vegetation. Beneficial use of treated sewage effluent from Dunne Road STP.	Possible accidental discharge of poor quality water from moat, Aquarium, Water Park, and Golf Course (see Notes 1 and 2). Possible adverse impacts on groundwater from ASS influences or mixing of aquifers (see Notes 1 and 2).
Air	Nil.	Dust emissions during construction (see Note 1). Increased greenhouse gas emissions through international jet travel, construction activities, energy and material consumption during operation (see Note 3). Possible impacts on airport operations (see Note 4).
Ecosystems	Enhancement of terrestrial and aquatic ecological processes for site and upstream and downstream areas.	Potential introduction of additional weed species and other impacts during construction and operation (see Note 1).
Flora and fauna	Additional habitat for native flora and	Traffic (i.e. roadkill) and noise disturbance to

VALUE	BENEFITS	COSTS
	fauna. Improved habitat connectivity for fauna.	fauna during construction & operation (see Note 1). Possible lighting impacts on fauna. Possible bird-strike impacts on aircraft operations (see Note 4).
Matters of NES	Avoidance of direct impacts and enhancement of natural values and processes on the site will enhance Matters of NES or at worst have no adverse impact.	To be determined. Indirect impacts on water quality and subsequent impacts on, for example, seagrass, dugong and turtle and the resources upon which they depend will need assessment.

Notes:

1. This potential impact is amenable to management via the EMP (Construction) and where relevant, EMP (Operation & Maintenance).
2. This is essentially a design issue. The design objective will be to manage surface water and groundwater such that there will be no adverse impacts. It is recommended that a Contingency Strategy be developed during the EIS to investigate management of un-planned releases (e.g. during flood).
3. It is recommended that a Sustainability Strategy be developed during the EIS to investigate opportunities to reduce greenhouse gas emissions and enhance other aspects of sustainability.
4. This is essentially a design issue. The design objective will be to limit all impacts on aircraft operations.

Table 7 summarises expected costs and benefits with respect to the social environment.

TABLE 7: SOCIAL ENVIRONMENT COSTS AND BENEFITS SUMMARY

VALUE	BENEFITS	COSTS
Indigenous cultural heritage	Opportunities for Djabugay involvement in cultural heritage management.	Nil (see Note 1).
Non-indigenous cultural heritage	Nil.	Nil.
Noise	Nil.	Likely emission of noise during construction (see Note 2). Likely operation phase noise particularly from Water Park (see Note 3).
Vibration	Nil.	Possible vibration impacts during construction (see Note 2).
Lighting	Nil.	Possible impacts on airport operations (see Note 4). Possible impacts on the nearest communities.
Visual aesthetics	Some viewers can be expected to see the development as visually attractive (see Note 6).	Some viewers can be expected to see the development as visually unattractive (see Note 6).

Notes:

1. Construction impacts on Indigenous cultural heritage values will be one of the elements included in the EMP (Construction). The form and detail of any Cultural Heritage Management Plan will need to be negotiated with the Djabugay people. This will be explored during the EIS.

2. This potential impact is amenable to management via the EMP (Construction) and where relevant, EMP (Operation & Maintenance).
3. This is essentially a design issue. The design objective will be to limit operation phase noise emissions.
4. This is essentially a design issue. The design objective will be to limit all impacts on aircraft operations.
5. It is recommended that a Sustainability Strategy be developed during the EIS to investigate opportunities to reduce greenhouse gas emissions and enhance other aspects of sustainability.
6. A visual impact assessment will be required during the EIS. This will identify the impact of the development and allow stakeholders to make informed decisions.

10.0 COMMUNITY AND STAKEHOLDER CONSULTATION

In respect of the likely response from the local and regional community to Aquis on the Great Barrier Reef, the proponent sought initial advice from The Cairns Institute (JCU, Cairns Campus) to ensure that locally relevant, yet world class and well networked Social Impact Assessment capacities were integrated early into the project design and definition stages. The Cairns Institute were consulted regarding the initial identification of social values, potential social impacts and possible mitigation and/or opportunities arising from the project for the local and wider community.

The Cairns Institute response congratulated the proponent on considering Social Impact Assessment from the outset and welcomed a long term partnership through all phases of the proposal.

The Cairns Institute recommended that "given the size and significance of this project the SIA process be designed within the context of a strong engagement framework." To assist the Cairns Institute prepare a Social Impact Assessment Framework as a basis for the project.

A variety of tools will be used to engage and consult. There will a community reference group formed with representatives from economics, environmental and community interests. Additionally there will be a technical working group from state agencies, liaison with DSDIP/CRC as assessment managers; engagement with a range of special interest areas and groups eg tourism, regional tourism operators, training and education, community groups, indigenous groups and organisations. A telephone survey may be undertaken, media advertising, use of social media feedback.

The following is a preliminary list, not exhaustive, of stakeholders identified for the provision of information and consultation in relation to the development:

Yorkeys Knob and Surrounds	• Friends of Redden Island (FoRi) • Machans Beach Community Association • Yorkeys Knob Residents Association • Stratford & Freshwater Community Association (SaFCa) • Holloways Beach Residents Association • Yorkeys Knob Promotional Group (linked to the YK Residents Assoc) • Local Tourist Attraction operators: Yorkeys Knob Marina, Skyrail, Cairns Kart Hire, Cable Ski Hire, Tjapukai Aboriginal Cultural Park, Golf Driving Range, Half Moon Bay Golf Club
Cairns and Region	• The Pullman Reef Hotel Casino • Cairns Chamber of Commerce • Advance Cairns • CAFNEC – Cairns and Far North Environment Centre • UDIA – development industry • JCU and Educational Institutions (TAFE), private language, business and training schools • Other Operators: Barron River White water rafting, Bungy jumping, Kuranda Scenic Railway • Paradise Palms Golf Club, Cairns Tropical Zoo, Hartleys Croc Farm, horse riding, a variety of fishing experiences • Great Barrier Reef operators, Daintree Rainforest and attractions and activities on The Tablelands

	• Tourism Tropical North Queensland • Cairns Region Tourism Association Inc • Tourism Palm Cove • Cairns Marine Tourism Operators Association • Cairns Professional Game Fishing Association Inc • Far North Queensland Tour Operator Association (FNQTOA) • Tourism Kuranda • Port Douglas Daintree Tourism Association
Other groups	• Great Barrier Reef Marine Authority (BGRMPA) • Yirrganydji Traditional Owners • CASA – Civil Aviation • Treeforce Association • Conservation Volunteers Australia • Recruitment and Employment agencies • Retailers Association of Qld
Tourism Organisations and Associations[7]	• Alliance for Sustainable Tourism • Association of Marine Park Tourism Operators (AMPTO) • Australian Amusement Leisure and Recreation (AALARA) • Australian Liquor, Hospitality and Miscellaneous Workers Union (LHMU) • Australian Hotels Association • Tourism Queensland • Indigenous Tourism Australia • Tourism Training Australia

[7] Source: http://www.tq.com.au/resource-centre/industry-directory/tourism-industry-contacts/tourism-industry-contacts.cfm

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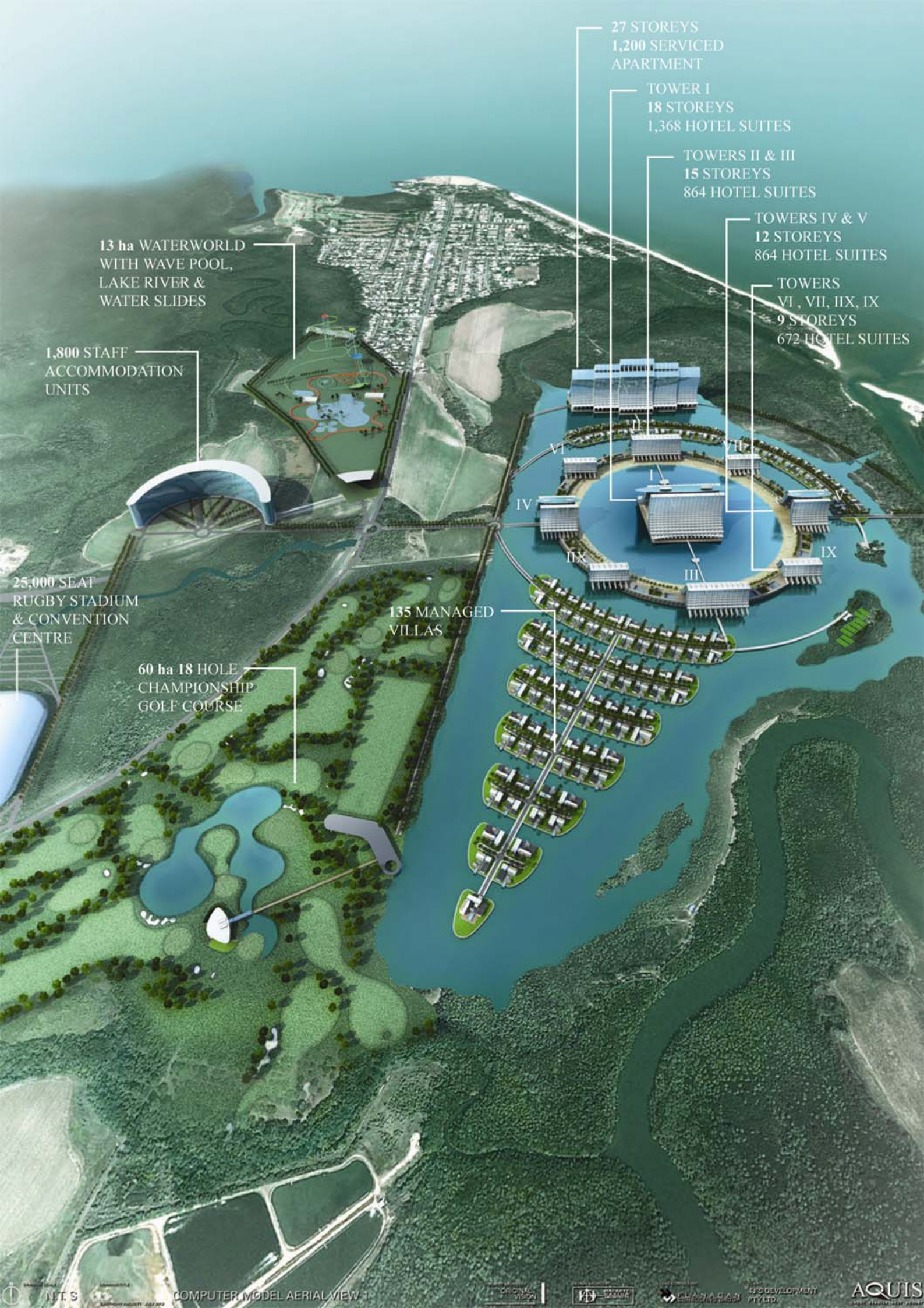
APPENDIX A



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65 ha MAN MADE LAKE
SERVICE APARTMENTS
A 27 STOREYS 360 UNITS
B 24 STOREYS 468 UNITS
C 21 STOREYS 352 UNITS
FACILITIES
R 135 RESIDENTIAL VILLAS
1 13ha WATERWORLD
2 1,800 STAFF ACCOMMODATION UNITS
3 25,000 SEAT RUGBY STADIUM & CONVENTION CENTRE
4 60ha 18 HOLE CHAMPIONSHIP GOLF COURSE
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