

KUR-World

Executive Summary

Chapter 0.0

Environmental Impact Statement



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Abbreviations used in this chapter are as follows:

Abbreviation	Meaning
FNQ	Far North Queensland
EIS	Environmental Impact Statement
MNES	Matters of National Environmental Significance
EPBC	Environment Protection and Biodiversity Conservation
TOR	Terms of Reference



1.0 INTRODUCTION

The KUR-World Integrated Eco-Resort (hereafter 'KUR-World' or 'Project') is designed to create a fundamentally different type of tourism experience in Far North Queensland (FNQ). The project is located at Myola, approximately 22 kilometres north-west of Cairns, soon after reaching the top of the Kuranda Range. It is approximately 35 minutes' drive from Cairns International Airport; with direct flights from most Australian cities and many regional centres, as well as overseas flights from Tokyo, Osaka, Seoul, Manila, Hong Kong and Singapore, with new direct services from several Chinese cities.

Tourism is the third largest export industry in Queensland (behind coal and food)¹, supporting almost 10% of all Queensland jobs through more than 52,000 tourism businesses (61% of those in regional areas)². Increasing numbers of international (+11.3%) and domestic visitors (+5.7%) to Queensland and The Queensland Ecotourism Plan 2016–2020 create a unique opportunity for KUR-World to contribute to the sustainable growth of the region, and to offer experience with diverse activities for a wide range of visitors. Projections prepared as part of this EIS suggest that a large component of the increased tourism demand in Far North Queensland will result from strong growth in Chinese visitation.

The Tropical North Queensland Tourism Opportunity Plan identifies several goals for tourism for the Far North Queensland region, including to support the development of new projects that are different to existing tourist offerings and support its vision:

"To encourage sustainable tourism opportunities that immerse targeted visitors in experiences which complement the region's unique natural and cultural assets"

KUR-World intends to become a hub for nature-based, cultural, educational and agricultural tourism on the Atherton Tablelands and beyond. The resort will offer tourists, students and locals, environmentally-based experiences set around four key themes, these being; 'Luxury Eco-Tourism'; 'Education and Business'; 'Rejuvenation, Health and Wellbeing', and; 'Adventure and Recreation'.

The KUR-World development is predicated on the following environmental and cultural objectives:

- Protecting, managing, and enhancing the site's environmental values for the wellbeing and enjoyment of the local community and wider FNQ region; as well as international and domestic tourists.
- Incorporating sustainable development principles from design to operation, in order to achieve accreditation from Ecotourism Australia (www.ecotourismaustralia.org.au) and EnviroDevelopment (<http://www.envirodevelopment.com.au/>).
- Retaining substantial areas of the site in a natural state to support high-quality, nature-based tourism experiences which acknowledge both Indigenous and non-Indigenous cultural connections to the land, as well as the importance of environmental conservation to the local community.

An integrated, high quality tourism experience is not currently represented in the Tablelands tourism market and would significantly widen and deepen sub-regional opportunities. Whilst close to Kuranda itself, KUR-World's integrated development philosophy and low visual impact would ensure that the established character of Kuranda is maintained.

¹ Queensland Statistician's Office Tourism Research Australia. State Tourism Satellite Accounts: 2014–15

² Tourism Research Australia. State Tourism Satellite Accounts: 2014–15 Tourism Research Australia & Tourism businesses in Australia: June 2011 to June 2015. Australian Bureau of Statistics.



2.0 PROJECT PROPONENT

The proponent of KUR-World is Reever and Ocean Developments Pty Ltd (Reever and Ocean), wholly owned by Mr Ken Lee, an Australian citizen currently residing in Macau, China. Mr Lee has been a regular visitor to Cairns over the past 15 years and decided to purchase the freehold properties in early 2014 for their medium/long term investment potential (the project area is under 10 titles). The company's ABN is 42 612 362 320.

3.0 SITE DESCRIPTION

The project site comprises 10 titles and 648.3 hectares of pasture, regrowth, forest, open woodland and watercourses. Currently, 90 hectares (13%) of the land are being used for cattle grazing and farming activities; the balance of the site is comprised of regrowth, rainforest, open woodland, watercourses and other uses.

4.0 PROJECT DESCRIPTION

KUR-World is comprised of a combination of short-term and permanent accommodation options, education opportunities, recreation, rejuvenation, nature-based activities and rural experiences. Its commercial basis is to focus on appreciation of the site's natural and cultural assets, as well as those of the Atherton Tablelands Key Biodiversity Area, Wet Tropics World Heritage Area and Great Barrier Reef World Heritage Area.

Since early iterations of the project concept, technical investigations of matters relating to a range of matters including flora and fauna, visual impact, cultural heritage and infrastructure services have led to the implementation of multiple design refinements (see Figure 4-5 and Table 4-1 in Chapter 4 'Project Description'). The purpose behind these refinements was to avoid potential project impacts wherever possible, and to mitigate non-avoidable potential impacts. Further design refinements have also been undertaken in response to community feedback, best-practice design methodologies and commercial considerations.

The current master plan (see Figure 0-1) and Plan of Development (Appendix 2B) divide the site into northern and southern nodes; with the northern node located on gently undulating to undulating pasture, having been predominately cleared of vegetation since at least the 1940s (based on aerial photo history), with some previously cleared areas, now characterised by regrowth vegetation. Two recognised watercourses traverse this area - Owen Creek and its tributary, Haren Creek.

The anticipated project capital expenditure is an estimated \$855.3m in resort infrastructure, facilities and accommodation; comprising:

1. Direct capital expenditure through the KUR-World entity - \$536.4 Million.
2. Capital expenditure, as part of the sale (i.e. buildings and land development) or following the sale of land to individual investors (i.e. investors who would then undertake building development) - \$318.9 Million.

The following facilities are proposed for the *northern node*:

- Farm Theme Park and Equestrian Centre
- Queenslander Lots



- Produce Garden
- Lifestyle Villas
- KUR-Village
- Business and Leisure Hotel and Function Centre
- KUR-World Campus
- Sporting Precinct
- Golf Clubhouse and Function Centre
- Golf Course
- Premium Villas
- Five Star Eco-Resort
- Health and Well-Being Retreat
- Glamping
- Environmental Areas
- Services/Infrastructure

The *southern node* is predominantly characterised by rainforest and eucalypt forest remnant vegetation. Aerial photos suggest these lots have mostly never been cleared (at least since the 1930s). Although some clearing occurred on four lots where areas were kept clear until at least 1971, this land remains relatively undisturbed and KUR-World intends to enhance its environmental values. Development within this area would be limited to low impact adventure and nature-based activities at The Rainforest Education Centre and Adventure Park, to be built in areas with no 'of concern' remnant vegetation and essential habitat.

KUR-World will be developed in three stages, although there is some scope for works to be sub-staged; based on demand, construction arrangements and/or the need to deliver infrastructure and services.

Stage 1

This stage sets the tone for KUR-World's targeted domestic and international tourism markets. It is divided into two sub-stages (1A and 1B) and it will be delivered over approximately two to three years. It includes:

- Farm Theme Park and Equestrian Centre (Stages 1A and 1B)
- Queenslander lots (1A)
- Produce garden (1A)
- Lifestyle Villas (1B)
- KUR Village (Stages 1B and 2)
- Business and Leisure Hotel and Function Centre (1B)
- Rainforest Education Centre and Adventure Park (1B), including Zip-Line
- Barnwell road access, main power upgrade and service connections (1A)
- Main access road, sewerage treatment plant, water storage, main power connections and service connections (1B).

Stage 2

Stage 2 is planned to start immediately after the completion of Stage 1 and constructed over a further two-year period. It includes:

- KUR-Village (Phase 2)
- The KUR-World Campus
- Sporting Precinct
- The 5-star Resort.
- Golf Club House and Function Centre
- Golf course
- Premium Villas (*Phase 1*)



- Five Star Eco-Resort
- Water storage, service connections, irrigation.

Stage 3

Stage 3 is planned to start immediately after the completion of Stage 2 and to be constructed over one year. It includes:

- The Health and Wellbeing Retreat
- Premium Villas (*Phase 2*)
- Service connections.



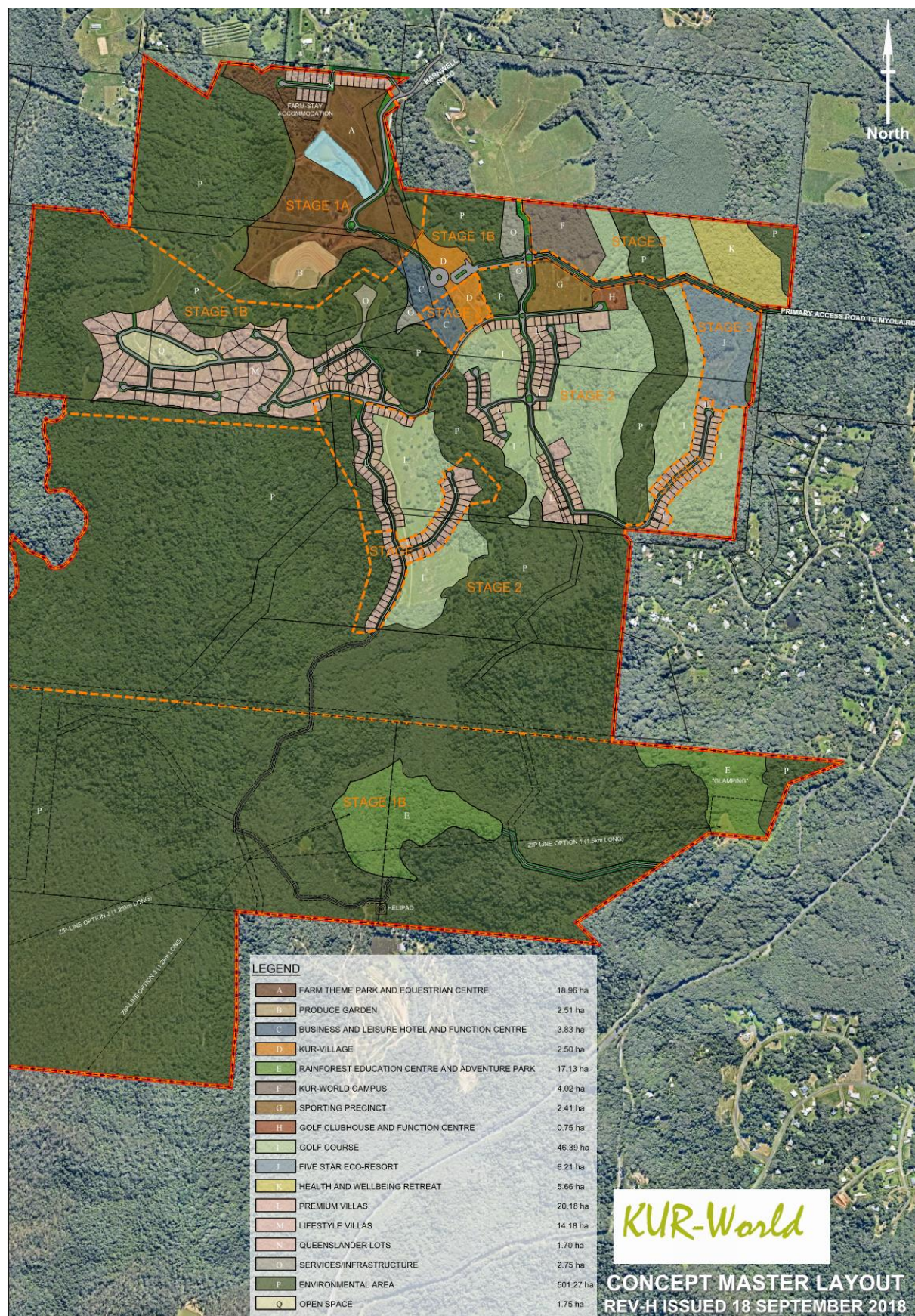


Figure 0-1: KUR-World Master Plan

5.0 LEGAL AND OTHER REQUIREMENTS

KUR-World has been declared a coordinated project by the Coordinator-General (CG), pursuant to Section 26(1)(a) of the *State Development and Public Works Organisation Act 1971* ('SDPWOA'). This Environmental Impact Statement has been prepared in accordance with Section 32 of the SDPWOA to support the CG's assessment of KUR-World under the SDPWOA. Notification was provided by the Australian Government, Department of the Environment (DotE) on 27 June 2016 (now, Department of Environment and Energy) that it considered that KUR-World represented a controlled action for which assessment and approval under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBCA) is applicable.

On 20 July 2016, the DotE advised that the assessment of KUR-World under the EPBCA could be undertaken by way of bilateral agreement with the Queensland Government.

Whilst KUR-World has been declared a coordinated project, it is still subject to the approval processes provided for by the *Planning Act 2016*, as modified by the SDPWOA. Upon receipt of approval from the CG, a development application will be made to Mareeba Shire Council comprising a Variation Request, to vary the effect of the *Mareeba Shire Council Planning Scheme 2016* in relation to KUR-World. The way in which the effect of the planning scheme will be sought to be varied is documented in the Proponent's proposed Plan of Development (PoD).

The provisions of the PoD provide that subsequent development approvals, each providing a Development Permit, will be required for Material Change of Use; Reconfiguring a Lot; Carrying Out Building Work; and Carrying Out Operational Work. Development applications will be lodged with Mareeba Shire Council (MSC) to seek the required Development Permits, aligned to the staging of the project.

6.0 LAND USE

The site comprises 10 freehold allotments. Most land adjoining the site is also freehold, except for:

- Small parcel of reserve land, identified as Lot 291 on NR6631, adjoining the site (Lots 19 and 95 on N157452) to the east; and
- Land adjoining the site (Lot 131 on N157491 and Lot 290 on N157480) to the south/south-west described as Lot 1 on AP19245, which is State Forest, being the Formartine State Forest, which extends along the Kennedy Highway, comprising a land area of 1,710 hectares.

The site has been mainly used for agricultural and grazing purposes since the 1900s. The Proponent has recently completed a refurbishment of the homestead and constructed various rural structures within its vicinity, to support the ongoing use of the site for various rural purposes and associated small scale tourism activities. The site is presently used for the following purposes:

- KUR-Cow: grazing and husbandry of beef cattle as part of the KUR-Cow business, that provides for the exporting of beef.
- KUR-Organics: growing of organic produce.
- Animal Keeping: keeping of animals including miniature donkeys, alpacas, goats and miniature horses. These animals are kept within enclosures near the house.
- Nature and Farm-based Tourism: small-scale tourism activities, associated with the rural and environmental features of the site.

A range of management controls are in place designed to minimise environmental impacts from use of the site for farming and tourism. These include ongoing maintenance of creek crossings and internal roads; supervision of tourism activities; and rotation of site activities between different areas.



7.0 INFRASTRUCTURE

Water supply and wastewater management

KUR-World's buildings and facilities will generate significant water demands and wastewater loads, which will be managed through a combination of water resources and infrastructure both internal and external to the site. Estimated water demand will be met by a combination of onsite sources (including groundwater, recycled water, rainwater and stormwater), as well as the Mareeba Shire Council (MSC) water network. A detailed hydrogeological investigation has been undertaken to provide an understanding of the regional and local hydrology at the site, and ultimately to confirm the maximum long-term sustainable groundwater yield to mitigate impacts on the environment and surrounding groundwater users.

Groundwater abstraction is viable from five of the existing bores. The water balance analysis has considered a maximum available groundwater supply of 0.54ML/day, based on abstraction from all five bores at 14 hours per day.

The recycled water supply assumed in the water balance analysis is based on estimated wastewater loads, as well as the high-level reference design for the proposed advanced wastewater treatment plant. In accordance with the reference design, a recovery efficiency of 90% has been assumed – with 90% of the site-generated wastewater converted to class A+ recycled water; with the remainder removed as part of the bio solids waste stream. As the proposed Waste Water Treatment Plant (WWTP) will not be constructed until Stage 1B, no recycled water supply has been assumed during Stage 1A. The average recycled water supply increases from 0.3ML/day at Stage 1B, to 0.71ML/day at the ultimate Stage 3.

Potential rainwater and stormwater yield has not been included in the water balance analysis and all demand and infrastructure sizing calculations have assumed zero supply from rainwater or stormwater sources. Opportunities for rainwater and stormwater harvesting will however be considered and integrated into the development; and as a minimum will include: 5kL rainwater tanks installed in all residential lots and 20kL rainwater tanks for all commercial precincts.

Other opportunities for stormwater harvesting and re-use will be considered in specific locations where both economically viable and provide other aesthetic and environmental benefits. These will be assessed and confirmed at the detailed design stage.

The proposed strategy for the supply of construction phase water is as follows:

- During construction of Stage 1A: Non-potable water demands will be supplied via temporary intakes from the existing farm dam and groundwater bores, until the onsite groundwater treatment plant is commissioned. Potable water will be supplied via tankers from the MSC network and stored in rainwater tanks for onsite use (estimated maximum 15kL/day).
- During construction of Stage 1B: Non-potable water demands will be supplied by the groundwater treatment plant and non-potable water network, treating and distributing water from the farm dam and groundwater bores. Potable water and any additional demand which cannot be met by the onsite supply (estimated maximum 0.3ML/day or approximately 15 x 20kL tanker vehicles per day) will be supplied via tankers from the MSC network.
- During construction of Stages 2 and 3: All construction and operational water demands will be supplied by a combination of the groundwater treatment plant, wastewater treatment plant, and potable water network in accordance with the ultimate development water supply strategy.

Estimates of construction phase wastewater loads have been developed for each stage. Estimates of construction wastewater load, operational wastewater load and total (combined construction and operation) wastewater load throughout the projected construction phase, along with the capacity of the



onsite wastewater treatment plant have been calculated at each stage. Average Dry Weather Flow (ADWF) figures are given below, reflecting the typical daily loads expected from construction activities given that no inflow or infiltration is expected.

- Construction wastewater loads are estimated to increase from year 0 to year 6 during the construction of Stages 1A, 1B and 2, and commencement of Stage 3, reaching a peak ADWF sewage load of 0.04ML/day, before reducing over the final two years of construction.
- The peak construction phase wastewater load of 0.59ML/day is below the ultimate development operational wastewater load and well within the capacity of the proposed onsite wastewater treatment plant, following commissioning of the first stage of the plant in parallel with Stage 2 of the development.

The proposed strategy for the supply of construction phase water demands is as follows:

- During construction of Stages 1A & 1B: portable toilets will be used for all construction activities, with all wastewater to be transported for offsite disposal to the Kuranda wastewater treatment plant (estimated maximum 0.04ML/day or approximately 2x20kL tanker vehicles per day).
- During construction of Stages 2 and 3: all site generated wastewater will be collected either via tankers or established parts of the proposed sewerage network and discharged to the proposed onsite wastewater treatment plant.

A high-level assessment of the spare capacity available at the Kuranda Water Treatment Plant (WTP) was undertaken for both existing and ultimate conditions, based on population and water demand projections and in accordance with the design criteria outlined in the FNQROC Development Manual. The existing Kuranda WTP is estimated to have sufficient spare capacity under ultimate conditions to meet the Average Day (AD) and Mean Day Maximum Month (MDMM) demand requirements of both the Kuranda Township and KUR-World development.

Although the spare capacity of the Kuranda WTP is insufficient to meet the PD demand requirements of both the Kuranda Township and KUR-World, excess demands under such 'peak' circumstances would need to be managed through appropriately sized storage reservoirs. Based on the projected demands of the Kuranda Township and KUR-World development, it is considered that the additional demand imposed by KUR-World will not trigger the requirement for significant upgrades to the Kuranda WTP, provided it can operate at its design capacity. Connection to the MSC water network is therefore proposed to meet KUR-World's potable water demand as well as to supplement the site's non-potable water supply.

Any significant additional demand generated by KUR-World will require additional storage to be constructed either onsite or at an alternative location on MSC's network. Based on preliminary advice from MSC, additional storage is proposed at the Myola Road reservoir site to meet the additional requirement generated by KUR-World. As there are no existing trunk water mains of any significant size/capacity within a reasonable proximity to the KUR-World site. Upgrades to the existing Kuranda water distribution network are proposed to service the KUR-World development. Further investigations and design will be required as part of future planning for KUR-World to develop the designs and ensure compliance with all relevant guides and standards.

Energy supply

In order to meet the substantial energy load attributed to KUR-World, it is currently proposed that a combination of Kuranda Range and Kuranda networks would be utilised, alongside a mix of renewable technologies. The exact configuration will ultimately depend on a detailed loads analysis and further input from Ergon, who have been engaged to provide further advice.

A review of *wind power* for the proposed development has identified that although the site may classify as a Class 4 Wind Power Resource (subject to further confirmation based on site-specific data), the limitations



to the delivery of wind power for the site mean that it is not currently proposed as part of the energy supply strategy. Further investigation including collection of site-specific wind data would be required in future design stages if wind power generation were to be included in the design.

The current design proposes to include a considerable amount of *Solar Photo Voltaic (PV)* in each precinct. The envisaged solar strategy includes:

- 20% of precinct rooftops to include Solar PV if practical.
- Each villa to include a 4kWp Solar system if practical.

The following Table 0-1 presents the proposed amount of Solar PV envisaged at each stage.

Table 0-1: Proposed solar power.

Stage	Proposed Installed Solar PV capacity per stage (kWp)
Stage 1a	248
Stage 1b	485
Stage 2	367
Stage 3	521

The utilisation of a *waste to energy* plant has not been included in the final concept design, due to the requirements and complexities of managing the waste streams on site; as well as the constraints of space and cost.

Several building design *Energy Efficiency Measures (EEMs)* are in consideration for the development. These EEMs cover several categories such as building envelope, lighting, rainwater reuse, efficient cooling and ventilation, as well as operational strategies. A mixture of measures such as occupancy sensors, natural ventilation, green roofs & walls, efficient cooling, variable refrigerant flow and thermal storage will be incorporated into the design of the development, with the final mix of measures confirmed as detailed design progresses.

Due to the wide variety of building class types proposed for the KUR-World development, there is also potential for a *Thermal Energy Storage* plant to provide efficient cooling to several buildings. This will be determined at the detailed design stage.

Telecommunications

The KUR-World site currently has a single Telstra connection, serviced from Barnwell Road. Initial information indicates that the NBN has been installed nearby and is currently in service. This service can be extended to the proposed development. It is likely that a new hub will be required within the development for the distribution of the Telstra/NBN services. Its location, size and other specific details will be coordinated with the service providers during future design stages.

Stormwater

KUR-World will adopt a best practice approach to stormwater management through the integration of Water Sensitive Urban Design (WSUD) across the development. This approach will assist in both mitigating flood and water quality impacts on the receiving environment and facilitating opportunities for rainwater and stormwater harvesting to supplement non-potable water demands across the site where feasible.



The KUR-World stormwater drainage strategy has been developed to meet the requirements of Section D5.08 of the Far North Queensland Regional Organisation of Councils (FNQROC) Development Manual for Stormwater Quality Management (FNQROC, 2014), including:

- All developments are required to include appropriate interception devices that ensure removal of suspended matter (litter) and treatment of contaminated stormwater prior to crossing the boundary of the development or discharge into downstream roadside gutters, stormwater drainage systems or waterways.
- Water quality interception devices or a combination of interception devices and treatments are required to remove at least 90% of total suspended solids (litter) of size greater than 3.0mm as well as sand, 60% of total phosphorus, and 40% of nitrogen and shall be configured to prevent re-injection of captured contaminants.
- Water quality interception devices or a combination of interception devices and treatments are designed to treat all first flush runoff, defined as that volume of water equivalent to the runoff from the three-month average recurrence interval (ARI) storm event (60% of the one-year ARI storm event).

The proposed development will increase the impervious fraction of the site, increasing the volume of stormwater generated by any rainfall event. WSUD features including rainwater tanks, swales, detention basins, bio-retention systems, ponds and lakes will be used to collect, attenuate and treat excess rainwater and stormwater, and enable harvesting for re-use onsite where feasible.

8.0 FAUNA & FLORA

Introduction

The KUR-World project has been designed to be predominantly developed in cleared areas or areas of non-remnant vegetation, reducing the potential for project-related environmental impacts. Key to the avoidance of impact on fauna and flora is the retention of approximately 500 hectares of existing habitat (equating to approximately 74% of the project area). This habitat is mainly in the western portion of the Kuranda-Myola-Kowrowa rainforest corridor, a significant feature for a large range of wildlife.

Flora and fauna communities in the project area have been described through both reviews of available information and field surveys. Important biodiversity and natural environmental values were identified, including vegetation types of conservation value, Threatened and Near Threatened species, Migratory species, important habitat and habitat corridors. The impacts on biodiversity and natural environmental values were assessed, and recommendations to mitigate impacts incorporated into the project design.

Flora

Three Threatened & Near Threatened (T&NT) plant species were identified within the project area. Details of the threatened species identified are provided below.

- Daintree Gardenia (*Randia audasii*) (NC Act Near Threatened).
- Slender Ginger (*Alpinia hylandii*) (NC Act Near Threatened).
- Myola Palm (*Archontophoenix myolensis*) (NC Act and EPBC Act Endangered).

All the database searches identified the potential presence of other T&NT plant species within the project area. The likely presence of these species on the project site was assessed using information obtained during both the desk-based review and field survey. The results of this assessment are summarised below.



- Probable occurrence (potentially suitable habitat present though species not recorded despite targeted searches):
 - *Crepidomanes majoriae* (NC Act Vulnerable)
 - *Diplazium cordifolium* (NC Act Vulnerable)
 - Endlicher's Filmy Fern (*Polyphlebium endlicherianum*) (NC Act Vulnerable; EPBC Act Endangered)
 - Smooth-bark Rose Apple (*Syzygium hodgkinsoniae*) (NC Act and EPBC Act Vulnerable)
 - Velvet Jewel Orchid (*Zeuxine polygonoides* Syn, *Rhomboda polygonoides*) (NC Act and EPBC Act Vulnerable).
- Possible (possibly suitable habitat present though species not recorded):
 - Rat's Tail Tassel-fern (*Phlegmariurus filiformis*) (NC Act and EPBC Act Endangered)
 - *Cajanus mareebensis* (NC Act and EPBC Act Endangered).

Fauna

The project area is located on the western fringe of the Kuranda township with areas of large residential blocks to the east, north and west. Many of the surrounding areas (as well as the KUR-World site) were historically cleared for farming; particularly to the north and east, and many of these are now occupied by residential areas or forested regrowth.

The project area occurs in a broad section of landscape where north-south connectivity for certain rainforest fauna is relatively limited. Rainforest corridors occur near Barron River Falls and the general Kuranda-Myola-Kowrowa areas. The KUR-World site contributes to the Kuranda-Myola-Kowrowa corridor, most substantially in the western portion. Additionally, the area of Eucalypt woodland/open forest west of the project area may also be an important north-south corridor for a variety of wildlife, especially for species that prefer sclerophyll habitats.

The corridors described above, to which the project area contributes, are potentially important for some high profile threatened species. For example, the rainforest corridors and ecotone areas may be important for the Southern Cassowary and the sclerophyll corridor and ecotone areas may be important for Northern Quoll (*Dasyurus hallucatus*), and (at least historically) for Northern Bettong (*Bettongia tropica*). The potential importance of these corridors to wildlife is recognised in various forums including the *Mareeba Shire Council Planning Scheme* and the *Wet Tropics Conservation Strategy 2004*.

Eight T&NT fauna species were recorded during the field surveys. A list of the recorded T&NT fauna species and their legislative status is listed below.

- Kuranda Tree Frog (*Litoria myola*). Endangered NC Act and EPBC Act.
- Gouldian Finch (*Erythrura gouldiae*). Endangered NC Act and EPBC Act. [NB –Most likely an aviary escapee].
- Bare-rumped Sheath-tail Bat (*Saccolaimus saccolaimus*). Endangered NC Act, Vulnerable EPBC Act.
- Greater Large-eared Horseshoe Bat (*Rhinolophus philippinensis*). Endangered NC Act, Vulnerable EPBC Act.
- Spectacled Flying-fox (*Pteropus conspicillatus*). Vulnerable NC Act and EPBC Act.
- Tapping Green-eyed Frog (*Litoria serrata*). Vulnerable NC Act.
- Macleay's Fig-parrot (*Cyclopsitta diophthalma macleayana*). Vulnerable NC Act.
- Tube-nosed Insectivorous Bat (*Murina florium*). Vulnerable NC Act.



Non-definitive evidence of Southern Cassowary (*Casuarius casuarius johnsonii*) and Red Goshawk (*Erythrotriorchis radiatus*) was recorded on the project area.

T&NT fauna species not recorded during field surveys though identified in the database search areas and could occur on the site are listed below.

- Likely to occur.
 - Southern Cassowary. Endangered NC Act and EPBC Act.
- May occur.
 - Australian Lacelid Frog (*Litoria dayi*). Endangered NC Act and EPBC Act.
 - Northern Bettong (*Bettongia tropica*). Endangered NC Act and EPBC Act.
 - Northern Quoll (*Dasyurus hallucatus*). Endangered EPBC Act.
 - Red Goshawk (*Erythrotriorchis radiatus*). Endangered NC Act, Vulnerable EPBC Act.
 - Semon's Leaf-nosed Bat (*Hipposideros semoni*). Endangered NC Act, Vulnerable EPBC Act.
 - Masked Owl (northern) (*Tyto novaehollandiae kimberli*). Vulnerable NC Act and EPBC Act.
 - Greater Glider (*Petauroides volans*). Vulnerable NC Act and EPBC Act.
 - Ghost Bat (*Macroderma gigas*). Endangered NC Act, Vulnerable EPBC Act.
 - Grey Falcon (*Falco hypoleucos*). Vulnerable NC Act.
 - Blue-faced Parrot-finch (*Erythrura trichroa*). Near Threatened NC Act.
 - Diadem Leaf-nosed Bat (*Hipposideros diadema reginae*). Near Threatened NC Act.
 - Lumholtz's Tree-kangaroo (*Dendrolagus lumholtzi*). Near Threatened NC Act.

The Australian Lacelid Frog, Red Goshawk, Northern Quoll, Ghost Bat, Grey Falcon and Lumholtz's Tree-kangaroo are likely to be non-resident and intermittent. The presence of Southern Cassowary is also likely to be intermittent.

The following Special Least Concern (NC Act) fauna were recorded on the project area.

- Short-beaked Echidna (*Tachyglossus aculeatus*).
- Spectacled Monarch (*Symposiachrus trivirgatus*).
- Rufous Fantail (*Rhipidura rufifrons*).

The Short-beaked Echidna was recorded during fauna surveys on surveillance cameras. The species could occur in any of the forested areas on the site and no specific areas of importance for the species are identifiable. It is likely to be locally common. The Spectacled Monarch and the Rufous Fantail were recorded in the project area during the baseline surveys. Both species are relatively common locally and regionally. A number of migratory-listed fauna could occur on the site:

- Likely to occur.
 - White-throated Needletail (*Hirundapus caudacutus*).
 - Fork-tailed Swift (*Apus pacificus*).
 - Black-faced Monarch (*Monarcha melanopsis*).
- May occur.
 - Oriental Cuckoo (*Cuculus optatus*).
 - Barn Swallow (*Hirundo rustica*).
 - Eastern Osprey (*Pandion cristatus*).



- Glossy Ibis (*Plegadis falcinellus*).

The draft EIS includes 45 recommendations related to the conservation and ongoing management of T&NT and Special Least Concern species, to ensure that they are not significantly impacted by the project. All of these recommendations are to be adopted and integrated into the implementation and management of the project.

Assessment under State and Commonwealth criteria has determined that Significant Residual Impacts (SRIs) are not anticipated for the following.

- DSIP (2014) and EHP (2014) only consider the potential for SRI on Threatened and Special Least Concern (non-Migratory) species. On this basis, the potential for SRI on the following Near Threatened fauna is not considered further. These species comprise: Blue-faced Parrot-finch, Diadem Leaf-nosed Bat and Lumholtz's Tree-kangaroo.
- The fauna species least vulnerable to the potential threats of the project are those predicted to have an intermittent occurrence on the project area, and whose core habitats or areas of activity are likely to be remote to the main area of potential impacts (considering direct and indirect threats). These species comprise: White-throated Needletail, Fork-tailed Swift, Greater Glider, Northern Bettong, Northern Quoll, Red Goshawk, Grey Falcon, Ghost Bat, Oriental Cuckoo and Barn Swallow.
- SRIs on Migratory fauna are not anticipated based on consideration of DoE (2013) SRI criteria. The project area may occasionally, and temporarily, support ecologically significant proportions of White-throated Needletail, Fork-tailed Swift and Spectacled Monarch populations; however, their habitats are unlikely to be substantially modified by the proposed action. The management of biosecurity items (that is Tramp Ants) is of critical importance for avoiding the potential for SRI on the Spectacled Monarch.

For the remaining Threatened fauna, the extent and relative proportion of potential core habitat loss are either minor or mostly affect habitats dominated by regrowth. Potential core habitat loss is minor or nil for the Kuranda Tree Frog, Australian Lacelid Frog and Bare-rumped Sheath-tail Bat. Habitat loss predominantly relates to regrowth vegetation for the Tapping Green-eyed Tree Frog, Greater Large-eared Horseshoe Bat, Spectacled Flying Fox, Macleay's Fig-parrot, Tube-nosed Insectivorous Bat and Southern Cassowary.

With the exception of Tapping Green-eyed Tree Frog, habitat loss is unlikely to have significant impacts on populations at the site, local or regional scales. Habitat loss could reduce the Tapping Green-eyed Tree Frog population at the site scale, though the loss is unlikely to be significant at the local or regional population scales. Further, the magnitude of impact on all the above species (including Tapping Green-eyed Tree Frog) will be reduced by habitat restoration. Consequently, SRI on the abovementioned species is unlikely.

9.0 WATER QUALITY

Historic or existing land-use practices upstream and on the KUR-World site itself have contributed to impacts on water quality, which is preventing the achievement of nominated WQOs for waters within and downstream of the project area. This has important implications for the proposed management of discharges to receiving waters and has been considered in the planning of the project and the development of mitigation measures. Management of point and diffuse sources from the KUR-World development are therefore designed to ensure that receiving water quality progressively improves and that the project design and operation aim to have a net positive impact on water quality.

Potential impacts to surface water and groundwater from the KUR-World development include spills of hazardous chemicals, land clearing, stormwater and waste water (which can all be mitigated through



appropriate on-site management of hazards); with spills contained and cleaned-up quickly. Potential impacts to the receiving environment will be mitigated by the capture and treatment of site waters through stormwater management Water Sensitivity Urban Design (WSUD) and the waste water treatment system.

An Erosion and Sediment Control Plan (ESCP) will be developed for both the construction and operation phases to minimise erosion and sediment loss. Nutrient loads from the Waste Water Treatment Plant (WWTP) discharge will be offset by improving water quality through mitigation measures in the catchment that receives discharge, and rehabilitation plans for improving frog habitat are expected to have a positive impact on water quality.

10.0 WATER RESOURCES

The KUR-World project will implement a best practice, integrated approach to total water cycle management through:

- Minimising water consumption and wastewater generation through water efficient planning, design, construction and operation.
- Maximising opportunities for onsite harvesting, treatment and re-use of rainwater, stormwater, and site generated wastewater.
- Managing stormwater quality and quantity through the integration of best practice water sensitive urban design into the site master plan.
- Sustainably abstracting and utilising groundwater, mitigating impacts to the environment and other groundwater users.

The Mareeba Shire Council holds a permanent 460ML/year high priority allocation for the Kuranda water supply system, as well as a number of other temporary allocations. Kuranda's existing Average Day (AD) water demand (excluding any additional demand generated by KUR-World) is currently estimated at around 1.19ML/day (434ML/year) and this is projected to increase to around 1.88ML/day (686ML/year) under ultimate (2030) conditions. Based on these figures, it is anticipated that MSC's existing high priority water allocation will be exceeded at some point in the relatively near future, and that additional allocations will need to be acquired from the MDWSS water market to accommodate planned growth in the township.

In addition, it is estimated that KUR-World will generate a total AD water demand on the MSC water network of around 0.97ML/day (354ML/year). This demand will contribute to increased water abstraction from the Barron River, which will need to be accommodated through additional allocations acquired by MSC. Given the tight regulation of water abstraction from the Barron Water Management Plan area, any additional allocations will need to be acquired from existing licence holders; so the net impact of the KUR-World project on the Barron River Water Resource is expected to be negligible.

11.0 SOCIAL & ECONOMIC IMPACT

The pattern of development in Far North Queensland underlies Kuranda's economic and social structure, characterised by: (i) a substantial Aboriginal population; (ii) a small-scale or hobby farming population, with land use increasingly reflecting urban fringe activities such as nurseries, horticulture and horse riding stables; (iii) a significant residential population catering for the large number of tourist day trippers and a small accommodation sector, and substantial creative industries/alternative lifestyle element; (iv) a substantial 'dormitory suburb' element who work in Cairns and other Tablelands centres, including substantial professional and higher socio-economic families, as well as a substantial component of more



recent inflow families from southern Australia; and (v) a business and trades population servicing local needs.

Consultation

Consultation for the KUR-World project commenced with its immediate neighbours in September 2016. Following initial feedback, a formal stakeholder analysis was undertaken, and a number of strategies implemented from October 2016 onwards, using a variety of techniques to ensure that engagement took place with all elements of the community:

- **Formal meetings:** between project team members to discuss issues and progress regarding infrastructure, environment and community; between project members, the Coordinator General office and government agencies.
- **Public forums:** Open Days for the wider community took place at Barnwell Farm in February and June 2017, as well as an Open Day for the Aboriginal community during September 2017.
- **Kuranda Pop-up Stall:** A fortnightly activity from 5-7pm located outside the local grocery store (Foodworks) in Kuranda.
- **Focus Group Discussions:** Presentations at regular or special meetings as required. These meetings have included events with the Mareeba Shire Council, The Wet Tropics Management Authority, Aboriginal parties and different government agencies.
- **Newsletters and Fact Sheets:** Including information regarding the project and are issued to subscribers, posted on the KUR-World webpage www.kur-world.com and included in local and regional newspapers (Kuranda, Cairns, Atherton and Mareeba).
- **Webpage:** Electronic newsletter, e-blasts, survey form, regular project updates, business register, charter and minutes of Community Reference Group meetings. Questions or comments posted to the project website or email (info@kur-world.com) were responded to in a timely manner.
- **Question and Answers:** A Question & Answer proforma, updated upon completion of the draft EIS and redistributed via the website and local newspapers.
- **Survey** – based on issues raised at the community meeting at the Kuranda High School in October 2016, a survey form was designed to ascertain the importance of various environmental, social and infrastructure concerns. The issues were listed, and respondents could tick whether this was an issue of high, medium or low concern. This survey was uploaded onto the KUR-World website and mailed to 8,327 residents and postal boxes in Kuranda, Mareeba, Smithfield and Cairns. The survey was also provided at the Pop-Up Stalls, Open Days and handed out to members of the Community Reference Group and loaded onto computer tablets for electronic survey collection. Locations to collect the surveys were provided in Kuranda and Mareeba; a postal address was also provided to mail the surveys.
- **Community Reference Group (CRG):** The CRG has played an important role in communicating community concerns and regional benefits, although the process has been difficult at times due to the diverse interests of the members. The members of the CRG represent key players for the project, including immediate neighbours, traditional owners, businesses, environmental groups, planning and resource management organisations, social services and legal matters. CRG members have also provided valuable information concerning potential contacts and opportunities for training, job readiness and capacity building for locals.

As feedback from surveys, fact-sheets, newsletters, Open Days and CRG meetings has become available, key concerns have emerged, for example:



- Habitat loss for endangered species - especially the Kuranda Tree Frog. To address this, the project has defined buffers to each side of sections of Owen, Haren and Cain Creeks, which have been identified as breeding or foraging habitat for the Kuranda Tree Frog. Additionally, these buffers will protect habitat of other important species such as the Myola Palm and the Southern cassowary, while helping to maintain water quality and quantity.
- Water quality - Infrastructure designs have also taken into consideration the importance of water quality and supply for the community.
- Indigenous employment - Consultations with the Aboriginal party and the wider Indigenous community have revealed an extremely strong desire for the project to provide meaningful and long-term jobs.

These have been addressed through modifications to the design of the project.

Socioeconomic Impact

Construction phase

Construction costs fall into two streams: (i) main resort construction totalling \$536.4 Million; and (ii) construction through property sales totalling \$318.9 Million. Construction is estimated to average about \$95 Million a year over nine years, with a peak in 2020-21 at \$160 Million. Direct construction employment is also expected to peak at about 348 Full-Time and Part-Time positions in 2020-21. With Type 1 'flow-on' effects in the regional economy, total employment generated by construction is expected to peak at about 713 Full-Time and Part-Time positions in 2020-2021.

Property sales

Property sales are planned over the first three years to 2020-21 and to recommence in Years 2023-24 and 2026-27. There will be a small impact of associated activity generated by sales activity, estimated at peak to be in the order of \$14 Million and to create about 30 direct jobs.

Resort operation

Revenue from resort operation is expected to build up over the 10-year period from a starting-point of \$17 Million a year to \$306 Million a year in 2027-28; when the resort will be fully operational. Day visitor numbers are projected to build up from 103,000 in 2018-19 to about 500,000 in 2027-28, an average of about 1,400 a day. Overnight guests are projected to build up from about 1,200 in 2018-19 to 240,000 in 2027-28; staying an average of three nights; generating about 720,000 visitor nights. The total for on-the-ground visitors each day is estimated at 2,000 by project completion.

Direct employment generated at the resort is estimated to reach about 1,450 Full-Time and Part-Time positions by 2027-28 and with Type 1 flow-on effects, generating a total of about 1,860 Full-Time and Part-Time jobs in the region.

Day visitors and overnight guests are estimated to generate expenditure of over \$230 Million in the economy away from the resort by 2027-28; with the majority being on outside tours by overnight stay visitors of about \$170 Million. The total modelled employment generated by this expenditure is expected to be approximately 1,313 in 2027-28 and with flow-on effects to rise to about 1,682. When fully operational, the resort will directly generate about 970 full time equivalent jobs, with a substantial part time employment requirement. Analysis of employment patterns indicates that of the workforce living in Kuranda, almost 60% work outside, especially in Cairns. There will hence be a significant opportunity to provide local employment for Kuranda residents currently traveling away from Kuranda for employment.



With appropriate training there will be a significant opportunity to reduce the high level of unemployment in the area, especially amongst the Indigenous population and to provide jobs for those currently underemployed; as well as a substantial ability to draw workforce from other Tablelands centres.

Economic benefit in 2027-2028

The economic impacts of the project, when fully established in 2027-28, are estimated as follows: (i) total direct expenditure \$470M (including away from resort); (ii) addition to Gross Regional Product (Cairns SA4 region) including Type 1 flow-on effects \$345M; (iii) initial employment generated in the Cairns region: 2,763; (iv) total employment generated including Type 1 flow-on effects in the Cairns region: 3,600. It is estimated that when fully operational, the project will add about 2.0% per annum to Gross Regional Product in the Cairns region (with flow-on effects). The estimated employment impact (including flow-on) is estimated to add about 2.7% to the Cairns region employed workforce by 2027-28.

The project is expected to increase day visitor numbers to Kuranda from a current level of about 1 Million a year to about 1.45 million a year by 2027-28. The KUR-World project is predicated on establishing iconic accommodation on the Tablelands and can be expected to dramatically lift day visitation to Tablelands attractions, stimulating the development of both existing and new tourism and support businesses. It is anticipated that most overnight resort guests will undertake a reef trip, adding in the order of 15% to expected reef visitation.

By 2027-28, KUR-World's overnight accommodation is expected to generate about 460,000 additional passenger movements by 2027-28 through Cairns airport; i.e. about a 9% increase on current passenger movements. The level of passenger movements would represent about 15 inward and 15 outward flights a week; especially flights from Chinese mainland cities.

Socioeconomic impacts on Kuranda

Apart from the direct impacts of the resort, there will be secondary impacts from expenditure by day trippers and overnight stayers amongst Kuranda shops and tourism facilities. Expenditure is estimated to run at about \$36 Million a year by 2027-28, generating a further 150 jobs, most of which are likely to be filled by Kuranda residents. Additional local employment by 2027-28 (including at the resort and due to secondary impacts), is estimated at about 500, generating a population of about 1,000 and requiring 354 additional dwellings.

Kuranda's population is currently about 4,700 and on long-term trends this could be expected to be about 5,500 by 2027-28. The addition to population generated directly by the project and secondary impacts on Kuranda are estimated to be about 1000 by 2027-28, adding 21% to the current existing population in the Kuranda area (i.e. the equivalent of an annual growth rate of 2% per annum). Kuranda's population is currently about 4,700 and on long-term trends this could be expected to be about 5,500 by 2027-28. The addition to population generated directly by the project and secondary impacts on Kuranda are estimated to be about 1000 by 2027-28, adding 21% to the current existing population in the Kuranda area (i.e. the equivalent of an annual growth rate of 2% per annum).

The additional requirement of about 350 dwellings by 2027-28 equates to an average of about 35 a year over the project lead-in period; as compared with an average of about 30 dwelling approvals per year over the past five years. Although dwelling allotments currently available in the area approximately equate to additional dwelling needs by 2027-28, to meet normal underlying growth of Kuranda and maintain a buffer to ensure the market does not overheat, there will be a need for further dwelling allotment subdivisions in the Kuranda area by about 2023-24.



Market ability to absorb KUR-World

Analysis of trends in tourism in Far North Queensland results in forward regional projection of visitation to 2028, as follows: (i) Chinese visitation growing at 15% per annum to 2021-22 and 5% per annum thereafter to about 710,000 per annum by 2027-28; (ii) other international visitors growing at 2.0% per annum from 181,000 to 852,000 by 2027-28; and (iii) domestic visitors continuing to grow at long-term trend of 2.5% per annum by 654,000 to 2,550,000 by 2027-28. Total regional visitation is therefore expected to grow from 2.8 Million to 4.1 Million by 2027-28 (i.e. by about 1.3 Million or an average of 3.2% per annum).

By comparison, visitor nights at KUR-World of 720,000 in 2027-28 compare with estimated additional regional visitor nights of about 8 Million; indicating significant market capacity for the project. Day trip numbers of 500,000 (when fully operational) compare with estimated additional 8 Million regional visitor days by 2027-28; also indicating significant market capacity for the project. The rate of development of the project can also be managed to suit both prevailing market and resource conditions, should these vary from those currently anticipated.

The accommodation sector in the Tropical North Queensland region in 2015-16 comprised of 3,980 rooms in hotels and resorts and 3,933 serviced apartments; a combined total of 7,913. Based on projected growth of tourism in the region, it is estimated an additional 3,800 rooms in hotels and serviced apartments would be required by 2027-28. The project is estimated to supply 1,400 rooms in hotel, resort, serviced apartments and villas by 2027-28; well below projected regional requirements.

Supply chain opportunities for Tablelands & Kuranda business

Surveying among local businesses in the region has indicated substantial opportunities for Tablelands businesses to supply KUR-World during the construction phase - across a range of materials, including concrete, timber and light steel fabrication; as well as opportunities for establishment of plant for fabrication of building trusses. The operational phase of KUR-World will also provide opportunities for Tablelands businesses to supply fresh produce, fruit and meat products, as well as adding significantly to the range of services in Kuranda and the wider Tablelands.

Potential for direct investment

The project will offer opportunities for local direct property investment in villas, 4-star and serviced apartments, with a total value of over \$200 Million.

Benefits for the wider Queensland and Australian economies

The project will strengthen the Cairns regional economy, with flow-on impacts through coastal regional economies to Brisbane and the south-east corner of the State. When fully operational, KUR-World can be expected to add in the order of \$400 Million a year to Gross State Product and add in the order of 4,000 jobs to the Queensland economy. Including flow-on effects, the project is expected to generate in the order of \$60 -70 Million a year in Queensland tax revenues. The project will help consolidate Queensland's position in international holiday tourism and especially help Queensland become the leading State in Australia for holiday visitors from China.

At the national level, KUR-World has the potential to play a significant role in diversifying Australia's growing economic engagement with China; developing significant people to people contact in the tourism sector, as well as across a wide range of goods and services and helping to foster bilateral social and cultural relations. The strongly regional location of KUR-World will help consolidate the role of Far North Queensland in spreading the positive impacts of international tourism beyond major metropolitan centres, with benefits to the Red Centre and Top End tourism, linked by strong air services through the Cairns hub; as well as throughout regional Queensland.



12.0 AIR

The air quality impact of the construction and operation phases of the KUR-World development will not cause or contribute to unacceptable ambient air quality levels in the vicinity. Mitigation measures have been recommended to reduce impacts on air quality and to ensure impacts are within relevant air quality criteria. The dense vegetation at the site is important for controlling impacts of dust and odour emissions on the site. A dust monitoring plan has been recommended for locations sensitive to dust deposition and a feedback and complaints register has been recommended to monitor achievement of air quality objectives.

13.0 TRANSPORT

The proposed KUR-World development will generate additional traffic on the surrounding network. The key potential impacts of the development traffic have been identified as:

- Increased delays, due to insufficient capacity at intersections or on road links within the study area; and
- Reduced safety, due to increased chance of conflict between vehicles.

An assessment of the predicted traffic impacts of the construction and operations phases was undertaken in accordance with the *Guidelines for Assessment of Road Impacts of Development (DTMR, 2006)*, which considered the contribution of both background traffic volumes and the development generated traffic volumes in each stage of the development and over the ten-year design horizon. The results of this traffic assessment showed that the surrounding road network generally had sufficient capacity to accommodate the future traffic volumes with various upgrades to improve road link and intersection capacity required to accommodate development traffic volumes.

The Level of Service (LoS) on the Kennedy Highway (Cairns to Mareeba) is anticipated to reach LoS D in pre and post development scenarios. The addition of traffic related to the KUR-World development resulting in LoS D being reached between four and seven years earlier than in the absence of the development. However, travel time increases are anticipated to be minimal. No measures to improve capacity of the Kennedy Highway are therefore proposed, as these would be unviable. Various other mitigation measures are proposed to reduce the impact of traffic generated by the development however, including Park and Ride sites for operational and construction staff, which are anticipated to begin operation prior to the commencement of construction of Stage 1B.

Proposed road safety upgrades have been developed to reduce the likelihood of accidents on the Kennedy Highway, specifically in relation to increased crash frequency due to development traffic. The proposed measures will require agreement from relevant agencies on their suitability and the rollout of mitigation measures.

There are no adverse impacts anticipated for air or public transport due to the operation of the KUR-World development. No adverse pedestrian impacts are anticipated. The project has potential to improve public transport in Kuranda, should demand exist within the community. It is anticipated that the pavement on the Kennedy Highway has sufficient capacity to accommodate the increase in heavy vehicles due to the development. An agreement is required be reached between Skyrail and Scenic Rail operators to provide for the transport of resort guests to KUR-World. A summary of all the proposed mitigation measures is given below:

Mitigation measures for intersections

- Extensions to the turn lanes at the Kennedy Highway / Myola Road / Rob Veivers Drive intersection to ensure the intersection operates within the acceptable limits over the design horizon. Right and left turn storage bay lengths on Myola Road are to be extended to 25m and 30m respectively, with the



right turn storage bay on Rob Veivers Drive to be extended to 30m. This is to be completed prior to the completion of Stage 3 construction and comply with DTMR and Austroads Standards.

- Upgrade of the Myola Road / Kuranda Heights Road intersection to a roundabout to accommodate the additional leg of the intersection as a development access and ensure the intersection operates within acceptable limits across the design horizon. This is to be completed prior to the completion of Stage 1B construction and comply with MSC and Austroads Standards.
- Provide a Channelised Right Turn Treatment at the Kennedy Highway / Greenhills Road intersection to provide right turn vehicle storage. This is to be completed prior to the completion of Stage 2 construction and comply with DTMR and Austroads Standards.

Mitigation measures for road links

- An additional overtaking lane is to be provided on the Kennedy Highway (Kuranda to Mareeba) for Mareeba bound traffic to improve capacity on this section. This is to be completed prior to the completion of Stage 3 construction and comply with DTMR and Austroads Standards. The suitable location is to be determined in conjunction with DTMR.
- Barnwell Road is to be upgraded to a sealed standard in accordance with FNQROC standards, prior to the completion of Stage 1A construction.

Road safety mitigation measures

- It is proposed to develop (in conjunction with DTMR) a Variable Speed Limit (VSL) on the Kennedy Highway (Cairns to Kuranda) to reduce the expected number of crashes to pre-development levels prior to the commencement of Stage 2 operation. The VSL proposes to reduce the speed limit by 10 or 20km/h dependent on road conditions. It is expected that there will be a reduction in the number of pre-development crashes of 4.3 crashes over five years with the addition of development traffic and the VSL.
- To reduce the expected crash rate on the Kennedy Highway (Kuranda to Mareeba) to pre-development levels with the addition of development traffic it is proposed to:
 - Provide Audio Tactile Centre Line Markings (ATLM) to 50% of the Kennedy Highway from Kuranda to Mareeba to reduce run off road and head on crash frequency. It is estimated that only 15% of the Kennedy Highway currently has ATLM.
 - Provide approximately 8.75 km of additional wire rope barrier on the Kennedy Highway in various locations on the road shoulder. This is proposed to reduce run-off road and loss of control crashes.
 - Provide additional warning and guide signage on the Kennedy Highway in various locations to reduce rear end crashes. The location and type are to be determined in accordance with DTMR.
- Filtered right turns are to be banned at the Kennedy Highway / Myola Road / Rob Veivers Drive intersection to improve safety at this location. This should be completed in conjunction with the capacity upgrades required at this location.
- Road Safety Audits of Barnwell Road, Myola Road and Rob Verviers Drive are to be completed and required mitigation measures (to be determined in coordination with MSC) implemented prior to development traffic volumes exceeding 5% of the base traffic volumes on these roads.



Other traffic mitigation measures

- A detailed Pavement Impact Assessment is required to be completed on the Kennedy Highway (Cairns to Kuranda) to determine pavement impacts of the development prior to the completion of Stage Two Construction.
- An agreement is to be reached between Skyrail and Scenic Rail operators confirming their ability to provide transport to KUR-World for resort guests.
- Sufficient on-site car parking is to be provided to accommodate the expected operational and construction traffic. It is estimated that 365 car parks will be required to be available to the public at the completion of Stage 3 construction.
- Staff Park and Ride facilities and shuttle service between facilities and KUR-World are to be provided at Smithfield and Mareeba for use by construction and operational staff to reduce traffic volumes on the Kennedy Highway. Approximately 170 car parking spaces will need to be provided at Smithfield with approximately 50 car parking spaces to be provided at Mareeba. The exact location of these facilities are to be determined and to be provided prior to undertaking Stage 1B construction (to be provided in stages to meet demand). Conditions of employment for both operational and construction staff should include the use of the shuttle service.
- A Construction Traffic Management Plan will be required prior to the commencement of construction to detail access to the site including the use of Park and Ride Shuttles for Cairns and Tableland based workers.

14.0 NOISE & VIBRATION

Some exceedances of noise relevant limits for the construction and operation phases of the KUR-World development are predicted. General construction noise impacts exceeding daytime noise affected levels are predicted for distances of up to 200 metres, and exceeding highly noise affected levels are predicted for distances of up to 20 metres. Haul truck traffic noise on access roads is calculated to have noise impacts for sensitive receptors on Barnwell Road and Myola Road. General noise mitigation measures to manage noise impacts have been provided, and a Construction Noise and Vibration Management Plan will be developed to address general construction and traffic noise during the construction phase.

Operational noise impacts exceeding relevant criteria were identified in the noise and vibration assessment. The sewage treatment plant is predicted to potentially exceed noise limit criteria. Operation of the sewage treatment plant requires completion of a detailed noise assessment during its design development to assess impacts with greater certainty and determine appropriate mitigation measures. The mechanical plant is determined to be potentially non-compliant; however, specifications for this operation are not yet available for thorough assessment. It is recommended that the mechanical plant be designed cognisant of the relevant noise limit criteria. The operation of the zip line and operational phase vehicle traffic has been determined to be compliant with noise limit criteria under assumed operation conditions. However, a detailed noise management plan will be implemented if the zip line is required to operate under different conditions. The helipad and amplified music venues are predicted to be compliant with noise limit criteria.

Noise impacts on sensitive receptors in the KUR-World development from the existing external pet resort and Billabong Hotel are expected to be compliant with noise limit criteria. Further measures to mitigate identified potential operational noise impacts will be provided by recommended detailed noise management plans at the detailed design stage.



15.0 WASTE MANAGEMENT

Demolition impacts

There will be no demolition undertaken as part of the proposed development, with the existing farm holding and stables being retained as part of the Farm Theme Park and Equestrian Centre precinct.

Construction impacts

Construction waste materials comprise of concrete, bricks, masonry, asphalt, steel, non-ferrous metals, wood, plastic, glass, plasterboard, mixed waste, canteen waste and hazardous waste. The proposed development will also generate excavated material as a result of the reduction in ground level required to construct foundations, piles, surface water drainage and other services and infrastructure.

It is predicted there will be a net surplus of cut and fill material of approximately 12,961 cubic metres in order to provide the required earthworks and landscaping. Where possible, surplus material will be utilised as part of the detailed design of landscaping and the golf course. In the event this is not possible, material will be exported off-site for re-use in other construction projects as a priority.

In line with the Queensland Waste Avoidance and Resource (WAR) Productivity Strategy C&D target by 2024, a minimum of 80% of construction waste generated by the proposed development will be diverted from landfill through re-use, recycling and recovery on and off-site. The implementation of this means that the annual estimated construction waste disposed of to landfill for the proposed development will not exceed 5.14% of the annual C&D disposal quantity for the Cairns region. This represents a minor impact significance. Construction waste that is re-used, recycled or recovered will be utilised on-site (for example, as inert fill or sub base) or by commercial recyclers.

Operational impacts

During operation, KUR-World is expected to generate the following key waste streams:

- General waste
- Segregated food waste from back of house facilities (assuming a capture rate of 75%, with the remaining 25% entering the general waste stream)
- Co-mingled recycling (assuming a capture rate of 75%, with the remaining 25% entering the general waste stream)
- Green waste
- Manure waste and used bedding material from the stables
- Wastewater treatment residues (bio-solids).

Annual estimated operational waste disposed of to landfill for the proposed development will comprise 3.22% of the current annual disposal quantity for the Cairns region, representing a minor impact significance. The annual estimated operational co-mingled recycling requiring processing at CMRF will comprise 9.66% of the predicted capacity of the CMRF and represents a minor impact significance.

It is intended that all segregated BoH food waste and green/manure waste will be managed and processed on-site, and will not be disposed of to landfill; therefore, no impact assessment is applicable relative to regional capacity/generation. The annual estimated operational bio-solids requiring disposal within the Cairns region will comprise 2.07% of the annual disposal quantity for the Cairns region, representing a minor impact.



16.0 BIOSECURITY

Field and desk-based assessments were undertaken to ascertain the potential and actual biosecurity matters relevant to the KUR-World project area.

Forty-three non-native flora species were identified during field surveys, each posing varying levels of threat in terms of their invasiveness, potential for spread and their potential to cause environmental, social and economic impacts. The dominant non-native flora species in the project area were Lantana (*Lantana camara*), Giant Bramble (*Rubus alceifolius*) and Sky Flower (*Duranta erecta*), and while these occurrences detract from habitat integrity, their presence is likely to benefit, or have a net-neutral effect on, some fauna species. Most other occurrences of non-native flora species pose a minor threat to the project area, with the exception of Cat's Claw Creeper (*Dolichandra unguis-cati*).

Non-native fauna species recorded on the project area were Feral Pigs (*Sus scrofa*), Cane Toads (*Rhinella marina*) and Dogs (*Canis* sp.). Three non-native fish species were recorded on the project area. Other biosecurity risks are present in the region, including Yellow Crazy Ants (*Anoplolepis gracilipes*) and Electric Ants (*Wasmannia auropunctata*). Feral Pigs, Cane Toads and Dogs are not noticeably abundant within the KUR-World development area.

The impacts of these species vary but are currently small-scale due to their low abundance. The non-native fish species present in the project area and the other biosecurity risks present in the region (that is Tramp Ants) have the potential to impact the project area. Mitigation and management measures minimising the spread of non-native flora and fauna species, and controlling existing non-native flora and fauna species, will be firmly integrated into the development during both construction and operational phases.

Preventative methods to stop the introduction/spread of Asian Honey Bees, Myrtle Rust, Phytophthora and Chytrid Fungus to the project area will be implemented. For example, any tools, vehicles or machinery entering the project area will go through the wash-down facility; a monitoring programme for Asian Honey Bees will be implemented, and a procedure detailing the control and eradication of Asian Honey Bees developed; during the construction period, the project area should be monitored annually (at a minimum) for plant dieback caused by Myrtle Rust and Phytophthora.

17.0 CULTURAL HERITAGE

Indigenous Culture

Archaeological research shows Aboriginal occupation of the region for over 30,000 years; with low level occupation of rainforest environments for at least 7,500 years before the present. Archaeological evidence suggests that the Wet Tropics was permanently settled in the last 1800 years. The first historical reference to contact of Europeans with *Bama* of the Kuranda area occurred in August 1876. By the 1920s many *Bama* had been removed from their traditional estates to the Mona Mona Mission along with people from the Gulf Savannah, Cape York Peninsula and other rainforest tribes.

Although *Bama* continued to live reasonably close to their traditional estate, restrictions placed on Aboriginal people through the *Aboriginal Protection Act 1987* (Qld) meant that *Bama* had little access to significant cultural sites and resources. In 1962, the Mona Mona Mission closed and many of the residents moved to the nearby townships of Mantaka, Kowrowa, Kuranda and Koah.

While there are multiple Story Waters or Dreaming stories associated with the coast around Cairns and the adjacent interior, one Djabugay story is pertinent to the trade route/Dreaming track associated with



Kuranda, the Barron River and the KUR-World site. This is a Dreaming story concerning the Barron River and its important trade and travel link between the coast and the Tablelands interior. The Djabugay story of *Gudju-Gudju*, the rainbow serpent also relates to the KUR-World site.

The KUR-World project site is a rich Aboriginal cultural landscape. In terms of cultural heritage sites listed on the DATSIP cultural heritage database, a key entry describes walking tracks, campsites and the effects of the Mona Mona Mission. Of note on the site are: campsites/pockets (one is on the Barnwell Homestead site); access to water including creek access and permanent springs; and two walking tracks - one crossing the project site from north to south, the other crossing its southeast corner.

Nut cracking rocks were the primary site type located within the proposed KUR-World development, most of which were portable stones with circular pits used for holding round nuts for cracking. Two nut cracking processing sites were recorded in creek beds, these were rocks that formed the creek bed with large numbers of circular pits used for cracking rocks. Processing sites also include edible and medicinal plants and running water possibly used for leaching.

The cultural and environmental health of the broad environment were both identified as highly significant to the Aboriginal party and the developers of KUR-World are in active discussions about how best to both protect and incorporate matters of *Bama* cultural significance into the development and its subsequent operation.

Non-Indigenous Culture

Historical land use in the Myola area has included: clearing of rainforest for the timber and agricultural industries; a short-lived coffee industry in the late 19th and early 20th centuries; and mixed farming and dairying until around the 1930s. When dairying became uneconomic, a significant area of land was abandoned; resulting in the regrowth of vegetation, particularly wattle. More recently, semi-rural lifestyle blocks have largely supplanted this past agricultural land use pattern.

In relation to their non-Indigenous context, the Myola and Kuranda areas are culturally significant in terms of the early history of the Atherton Tablelands. Within the proposed KUR-World development area, there are at least 26 historic sites with potential heritage value. Of these, six require further research; two have archaeological potential; and another two require further investigation and assessment for potential entry onto the Queensland Heritage Register. One site requires further investigation and assessment for entry onto the Mareeba Shire Council's Local Heritage Register.

18.0 HAZARDS, HEALTH & SAFETY

The management of risk is an integral component of the proposed KUR-World project. The risks include natural hazard events, wildlife and human health hazards, technological hazards, accidents, spillages and abnormal events that may occur during the construction and operational phases of KUR-World. Implications related to climate change are also identified and assessed.

A comprehensive risk assessment covering a wide range of risks has been undertaken. For each risk, the unmitigated risks and impacts were analysed and after control and mitigation measures were established, the risks were re-assessed and the residual risk calculated. After this process, only two out of the 32 risks analysed had 'high' residual risk ratings. These risks relate to pests and diseases, and the "sunny-day" Failure of Tinaroo Falls Dam. Pests and diseases scored a 'high' residual risk for environment, due to the presence of tramp ants in the vicinity of the project site and their behaviour. Although a biosecurity plan will be established, is not possible to fully eliminate the risk of tramp ants arriving to the project site through neighbouring borders. The potential for failure of Tinaroo Falls Dam scored a 'high' residual risk



for property, because it is beyond the capabilities of the proponent to fully mitigate the consequences of the Tinaroo Falls Dam failing, this event would affect the property even when mitigation measures are in place.

19.0 MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

The EPBC Act Protected Matters Search Tool (PMST) was used to generate a Protected Matters Report for the project area within a 10 km radius of point -16.8306, 145.6032 (DoEE 2017a). Supplementary database and mapping searches were used to identify additional potential MNES present:

- DEHP Wildlife Online database (DEHP 2017a). Report was generated for the area within a 10 km radius of point -16.8306, 145.6032.
- Atlas of Living Australia search (ALA 2017). Review of specific species records and a database search within a 5 km radius of point -16.8306, 145.6032.
- Regional Ecosystem (RE) mapping (Version 8.0) (DNRM 2017).
- Reports relevant to the project area: Astrebla (2015a, 2015b); Hoskin (2016).
- Literature relevant to flora, fauna, ecosystems and values known to occur in the region.

Based on the Protected Matters Report (DoEE 2017a) the MNES that may occur in, or may relate to, the project area are:

- World Heritage Properties
- National Heritage Places
- Listed Threatened Species and Ecological Communities
- Listed Migratory Species

The remaining four categories are not relevant to the project. These are:

- Wetlands of international importance
- Commonwealth marine areas
- Nuclear actions (including uranium mining)
- A water resource, in relation to coal seam gas development and large coal mining development.

The Great Barrier Reef Marine Park is not included on the Protected Matters Report. However, since the project site is part of the Great Barrier Reef catchment, and this MNES is also included in the final Terms of Reference for KUR-World, the impacts of the project on The Great Barrier Reef Marine Park are discussed.

A summary of the MNES relevant to the project area and potential impacts is presented in Table 0-2 below.



Table 0-2: Assessment of MNES as Controlling Provisions

EPBC Act MNES	EPBC Act Protected Matters Search Tool results	EPBC Act Controlling Provision	Summary of Potential Impacts
World heritage properties	Wet Tropics of Queensland	World heritage properties	There are no expected direct impacts on the Wet Tropics WHA. Impacts on Threatened species found on the KUR-World site that potentially use the Wet Tropics WHA can be avoided or mitigated.
National heritage places	Wet Tropics of Queensland Wet Tropics World Heritage Area (Indigenous Values)	National heritage places	There are no expected direct impacts on the Wet Tropics WHA. Impacts on Threatened species or cultural values found on the KUR-World site that are relevant to the Wet Tropics WHA can be avoided or mitigated.
Wetlands of international importance (Ramsar)	The project area is not located within a Wetland of international importance. The closest Wetland of international importance is Bowling Green Bay, approximately 400 km to the south-east of the project area	The project area is not located within a Wetland of international importance. The closest Wetland of international importance is Bowling Green Bay, approximately 400 km to the south-east of the project area.	Not applicable
Listed Threatened species and ecological communities	49 Threatened species (or their habitat) and 1 Threatened ecological community are reported by the EPBC Act Protected Matters Search Tool as known to occur, likely to occur or may occur within the 10km search radius from the centre point of the search area.	Listed Threatened species and ecological communities.	With the exception of Tapping Green-eyed Tree Frog, the project is unlikely to have significant impacts on populations at the site, local or regional scales. Habitat loss could reduce the Tapping Green-eyed Tree Frog population at the site scale, though the loss is unlikely to be significant at the local or regional population scales. Moreover, the magnitude of impact on all species (including Tapping Green-eyed Tree Frog) will be reduced by habitat restoration.

EPBC Act MNES	EPBC Act Protected Matters Search Tool results	EPBC Act Controlling Provision	Summary of Potential Impacts
Listed Migratory species protected under international agreements	22 listed Migratory species (or their habitat) are reported by the EPBC Act Protected Matters Search Tool as known to occur, likely to occur or may occur within the 10km search radius from the centre point of the search area.	Listed Migratory species protected under international agreements	The KUR-World site may occasionally and temporarily support ecologically significant proportions of White-throated Needletail, Fork-tailed Swift and Spectacled Monarch populations; however, their habitats are unlikely to be substantially modified by the proposed action.
Commonwealth marine areas	Not applicable. The project area is remote (> 10 km) from the closest point of the Commonwealth marine area.	Not applicable. The project area is remote (> 10 km) from the closest point of the Commonwealth marine area.	Not applicable
Great Barrier Reef Marine Park	The project area is remote (> 10 km) from the closest point of the Great Barrier Reef Marine Park.	The project area is remote (> 10 km) from the closest point of the Great Barrier Reef Marine Park. However, as the project site is part of the Great Barrier Reef catchment, the impacts of the project on The Great Barrier Reef Marine Park are addressed.	Potential downstream effects the KUR-World project on the Great Barrier Reef MP are negligible and can be avoided through adoption of specific on-site mitigation infrastructure.
Nuclear actions	Not applicable. The action will not be a nuclear action.	Not applicable. The action will not be a nuclear action.	Not applicable
A water resource, in relation to coal seam gas development and large coal mining development	Not applicable. The action will not be in relation to coal seam gas development or large coal mining development.	Not applicable. The action will not be in relation to coal seam gas development or large coal mining development.	Not applicable
Other matters protected by the EPBC Act			
Commonwealth Land	The project area is not located on Commonwealth Land.	The project area is not located on Commonwealth Land.	Not applicable
Commonwealth Action	The project is not a Commonwealth Action.	The project is not a Commonwealth Action.	Not applicable
Commonwealth Heritage Places	The project area is not a Commonwealth Heritage Place.	The project area is not a Commonwealth Heritage Place.	Not applicable



EPBC Act MNES	EPBC Act Protected Matters Search Tool results	EPBC Act Controlling Provision	Summary of Potential Impacts
Listed Marine species	31 listed Marine species are reported by the EPBC Act Protected Matters Search Tool as known to occur, likely to occur or may occur within the 10km search radius from the centre point of the search area.	31 listed Marine species are reported by the EPBC Act Protected Matters Search Tool as known to occur, likely to occur or may occur within the 10km search radius from the centre point of the search area.	Potential downstream effects the KUR-World project on marine species are negligible and can be avoided through adoption of specific on-site mitigation infrastructure.
Critical Habitats	Not applicable. There are not critical habitats for the survival of threatened species on the project site.	Not applicable. There are no critical habitats for the survival of threatened species on the project site.	<i>Not applicable</i>
Commonwealth Reserves (Terrestrial and Marine)	Not applicable. There are no registered Commonwealth Reserves within the 10 km search radius from the centre point of the search area.	Not applicable. None within the 10 km search radius from the centre point of the search area.	<i>Not applicable</i>



20.0 CUMULATIVE IMPACTS

The assessment of the cumulative impacts of the proposed KUR-World project is a requirement of the Terms of Reference (ToR) for the EIS. The definition of a cumulative impact in the ToR is defined as the “combined impacts from all relevant sources (developments and other activities in the area)”.

The inclusion of Cumulative Impact Assessment (CIA) is an evolving requirement for EIS and there is no single accepted state of global practice (IFC, 2013). The International Finance Corporation (IFC) which is part of the World Bank Group has produced a Good Practice Handbook to assist developers to assess cumulative impacts. A six-step process recommended by the IFC was used to assess cumulative impacts on valued environmental and social components (VECs) on which other existing or future developments may also have detrimental effects, and (b) avoid and/or minimize these impacts to the greatest extent possible.

The VECs have been drawn from the stakeholder engagement conducted during the EIS process as well as the studies conducted during the EIS. Some of these VECs also overlap with the critical matters studied in detail in this EIS. The present conditions of the VECs (baseline studies) were studied extensively during 2017 and the results of these studies are presented in the EIS.

For the purposes of this CIA, cumulative impacts are considered at the District/Local level (geographical radius 32km from KUR-World); Sub-regional level (radius 64km from KUR-World) and Regional level (128Km from KUR-World) – Map 20-1; Tables 20-3 and 20-5. Within these zones, projects were selected for comparable environmental and/or socioeconomic characteristics and compared in relation to their proximity to WHAs or other Protected Areas (within/adjacent/proximate). To help inform cumulative impact assessment reporting treatment, two broadly comparable tourism-based developments outside these zones have also been described (Lindeman Great Barrier Reef Resort and Iwasaki Capricorn Integrated Resort) – Map 20-1; Tables 20-4 and 20-5.

The main two sources of local cumulative impacts are associated with the tourism industry and residential development (both urban and non-urban) in and around Kuranda. The current situation and future predictions for these potential impacts were studied extensively in the Social and Economic Impact Assessment (Chapter 11) of this EIS. The proposed KUR-World development is predicted to result in no significant negative cumulative impacts but to provide significant positive flow-on opportunities for employment and local business, especially for Kuranda and the wider Tablelands.

The IFC (2013) Good Practice Handbook for CIA recommends that proponents are responsible for determining how their own project is contributing to cumulative impacts and devising their own monitoring and management measures. This has been completed for the proposed KUR-World project with Chapter 21 detailing the Environmental and Social Monitoring and Management Plans (EMP and SMP) for all matters including those considered VECs by this cumulative assessment. If the leading practice standard that has been applied to the KUR-World project by the local and state government agencies was applied to all other developments, the cumulative opportunities identified would be realised and the detrimental impacts managed in accordance with the recommended IFC mitigation approach.

21.0 ENVIRONMENTAL & SOCIAL MONITORING & MANAGEMENT PLANS

The objectives of the Environmental Management Plan (EMP) and Social Management Plan (SMP) are to:

- Establish objectives and performance criteria for relevant concerns.
- Demonstrate compliance with relevant legislative requirements.



- Provide evidence of prevention, minimisation and mitigation measures for potential adverse impacts to stakeholders and the community.
- Provide details of the implementation responsibilities.
- Set achievable reporting requirements and auditing responsibilities for meeting performance objectives.
- Provide a plan for monitoring, assessing and controlling potential impacts on identified values.

The EMP identifies eight environmental elements that require strategic assessment and management. These are: (i) Land Management; (ii) Flora and Fauna; (iii) Water Quality and Aquatic Ecology; (iv) Water Resources; (v) Air Quality; (vi) Noise and Vibration; (vii) Waste Management; and (viii) Biosecurity. The SMP identifies eight social and economic elements that require strategic assessment and management plans: (i) Community and stakeholder engagement; (ii) Workforce; (iii) Housing and accommodation; (iv) Local business; (v) Community wellbeing; (vi) Transport; (vii) Cultural Heritage; and (viii) Hazards, Health and Safety.

The EMP and SMP are intended to be living documents that will be responsive to changes in construction plans, stakeholder priorities and research results. From time to time, amendments to the EMP and SMP may require engagement with relevant stakeholder groups. As a minimum, the EMP and SMP will be reviewed and, if necessary, revised in conjunction with changes to the construction and operation phases. Changes to the construction and/or operation schedule or methods (including recommendations based on the performance monitoring of the control measures) will necessitate changes to the EMP and SMP. The performance of the EMP and SMP will be periodically audited.

