FLANAGAN CONSULTING GROUP
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Ports North

CAIRNS SHIPPING DEVELOPMENT PROJECT

Revised Draft Environmental Impact Statement

APPENDIX AP: Social Impact Assessment Report (2017)

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Cairns Shipping Development Project: Revised EIS Report

TS9: Social Impacts

Prepared for:

Flanagan Consulting Group

By:

Briggs & Mortar Pty Ltd

Job No.
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Acronyms and Abbreviations

Acronym/Abbreviation	In Full
ABS	Australian Bureau of Statistics
AHD	Australian Height Datum
ASGS	Australian Statistical Geography Standard
CBD	Central Business District
CCLT	Cairns Cruise Liner Terminal
CRC	Cairns Regional Council
CSD Project	Cairns Shipping Development Project
DET	Department of Education and Training
DoEE	Department of Energy and Environment
DILGP	Department of Infrastructure, Local Government and Planning
DSD	Department of State Development
DMPA	Dredge Material Placement Area
DTMR	Department of Transport and Main Roads
EIS	Environmental Impact Statement
EPBC Act	Environment Protection and Biodiversity Conservations Act 1999
ERP	Estimated resident population
FNQRP	Far North Queensland 2009-2031 Regional Plan
FNQTSRM	Far North Queensland and Torres Strait Roadmap 2013 – 2016
FCG	Flanagan Consulting Group
GBRWHA	Great Barrier Reef World Heritage Area
GBRIMC	Great Barrier Reef International Marine College
GBRMP	Great Barrier Reef Marine Park
GBRMP Act	Great Barrier Reef Marine Park Act 1975
GBRMPA	Great Barrier Reef Marine Park Authority
GBRWHA	Great Barrier Reef World Heritage Area
IMO	International Maritime Organisation
IRSD	Index of Relative Socio-Economic Disadvantage
LGA	Local Government Area
NPWS	National Parks and Wildlife Service
O&EECs	Outdoor and Environmental Education Centres
PASS	Possible Acid Sulphate Soils
Ports North	Far North Queensland Ports Corporation Limited
QPS	Queensland Police Service
RDA	Regional Development Australia

RL	Reduced Level
SA1, SA2, SA3	Statistical Areas Level 1, 2 and 3 (see below)
SEIFA	Socio-Economic Indexes for Areas
SEWPaC	Department of Sustainability, Environment, Water, Population and Communities
SIA	Social Impact Assessment
ToR	Terms of Reference
TSHD	Trailer Suction Hopper Dredge

Glossary of Technical Terms

Term	Meaning
Cane headlands	The area at each end of a planted field for turning
Capital Dredging	Dredging undertaken to create new shipping channels or enlarge existing ones, as well as berth areas, swing basins, marinas and boat harbour areas, as opposed to maintenance dredging (see below)
Estimated resident population	Adjustment of census counts of usual residents to include those missed in the census and those who were overseas on census night and also take account of births and deaths occurring between 30 June and census night (usually early August)
Maintenance dredging	Dredging undertaken to maintain existing port and marina facilities to provide vessels with safe access
Population based on place of usual residence	The address where a person usually lives. It may, or may not, be the place where the person stayed on Census Night
SA1, SA2, SA3	Geographic areas used by the Australian Bureau of Statistics and defined under the Australian Statistical Geography Standard

EXECUTIVE SUMMARY

Introduction

This Technical Study is an input to a Social Impact Assessment (SIA) of the Cairns Shipping Development (CSD) Project revised draft Environmental Impact Statement (EIS) being prepared for the Far North Queensland Ports Corporation Limited (Ports North).

It focuses on the social impacts of dredge placement within two land placement precincts which will be the subject of the revised draft EIS. It is proposed that delivery of dredge material to these sites will be by pumping and the project includes inlet pipelines and tailwater management. It will also assess other social changes arising from redistribution of shipping between Cairns and Yorkeys Knob.

The placement sites are at:

- Barron Delta (Northern Sands) Dredge Material Placement Area (DMPA) (an existing void in the Barron River delta created by past sand extraction and now used for burial of 'inert' construction and demolition fill).
- Previously reclaimed Ports North land at Tingira Street, Portsmith.

Background

The study is undertaken in the context that strong growth in the cruise ship market in Australia offers an opportunity for the region as an existing major cruise ship port. However, this growth has been accompanied by an increase in the size of cruise ships. Cairns is recognised as having a major challenge to achieve the deepening of the harbour channel and port anchorages to accommodate these larger cruise vessels. At the same time, while economic development is an important community value, environmental sustainability and protection of the Great Barrier Reef are also important.

A previous proposal conflicted with the latter values in that marine placement of dredge material was considered. The overall key outcome of engagement activities was broad support for the CSD Project proceeding in relation to the economic benefits it will deliver to the local and regional economy; however given the significance of the Great Barrier Reef to tourism and the role tourism plays in the local economy, the majority of people were also very keen to ensure the reef is protected during the process.

The current proposal evaluates land based disposal of capital dredge material at two locations in order to resolve those conflicting values.

Initial Assessment

Future possible impacts of the proposal were identified through a process of prediction based on the profile of the existing social environment including surrounding land uses, the nature of the proposed development, review of documentation on community character and values, and the findings of consultation.

It found that there would be the following potential adverse impacts:

<u>Barron Delta DMPA</u>

- a minor temporary change in the coastal area from the establishment and operation of a pipeline making landfill near the mouth of Richters Creek
- a minor temporary change in the amenity of residents in nearby suburbs, including those overlooking the Barron Delta DMPA and those in the northern part of Holloways Beach
- a minor temporary change in the use of the beachfront and creek mouth of Richters Creek by a small number of users, and a minor threat to safety and wellbeing which could be mitigated by appropriate fencing and signage

- some temporary minor restrictions to recreational fishing and boating on Richters Creek, and to the amenity of the creek environment

Tingira St DMPA

- only negligible adverse impacts.

Other areas

- a minor impact of land based wharf upgrade construction works, dredging and change in number of ship arrivals on residents in the Wharf St area, and a moderate impact long term as a result of increased ship arrivals
- a minor adverse impact on local business and tourism operators, and the Boat Club, in the short term, but a beneficial impact long term, in relation to the change in number of ship arrivals at Yorkeys Knob.

Positive beneficial impacts were found likely to include:

- a beneficial impact in the short term for the landowner of the Barron Delta DMPA
- a compatible land use in the Tingira St DMPA area, which would result in the provision of additional port industrial land
- a beneficial impact short term for ship passengers and crew, and long term for local business and tourism operators, and the Boat Club, in relation to an increased number of ship arrivals at Yorkeys Knob.

Risk Assessment

A risk rating analysis identified that there were no high or extreme risks relating to social impacts of the proposal, and only one medium risk during construction:

- establishment of the pipeline and laydown area changing the character of the coastal area

and two during operation:

- the Increased number of ship arrivals affecting the amenity of residents in the Wharf St area
- the decreased number of ship arrivals in Yorkeys Knob in the short term affecting business and tourism operators, and the Boat Club.

On the other hand there were five extremely or highly positive likely outcomes during operation.

Mitigation/Enhancement Measures

The mitigation measures inherent in the proposal have been found to be extensive. There are nevertheless some possible opportunities to further mitigate adverse impacts and to enhance some beneficial impacts. Other opportunities which may further reduce social impacts have been proposed by visual, noise, air quality and traffic assessments.

Conclusion

Overall, the adverse social impacts identified in this Technical Study have generally been found to be negligible or minor. The majority are temporary in nature. There was only one impact that was identified as potentially

moderate. Several beneficial impacts were also identified by this Technical Study. From a social perspective, there are no concerns which would warrant the project not proceeding.

1. Introduction

1.1 Introduction

This Technical Study has been prepared for Flanagan Consulting Group (FCG) as an input to a Social Impact Assessment (SIA) of the Cairns Shipping Development (CSD) Project revised draft Environmental Impact Statement (EIS). The EIS is being undertaken by FCG for the Far North Queensland Ports Corporation Limited (Ports North).

A draft Socio-economic Impact Assessment (SEIA) was previously carried out in 2014 as part of a draft EIS to assess the potential social impacts and benefits associated with the construction and operation of the proposed CSD Project at the Port of Cairns as it was then proposed. This included a larger volume of dredging and marine placement of dredged material.

Since that time, project recalibration investigations have been undertaken to redefine the extent of channel dredging by considering changes to target cruise ships and assessing the impact on channel design to reduce dredge volumes and costs.

In addition, a Dredge Material Placement Options Study was undertaken by FCG to expand on the land based placement options assessed in the draft EIS, in order to inform a detailed assessment of impacts in a revised draft EIS.

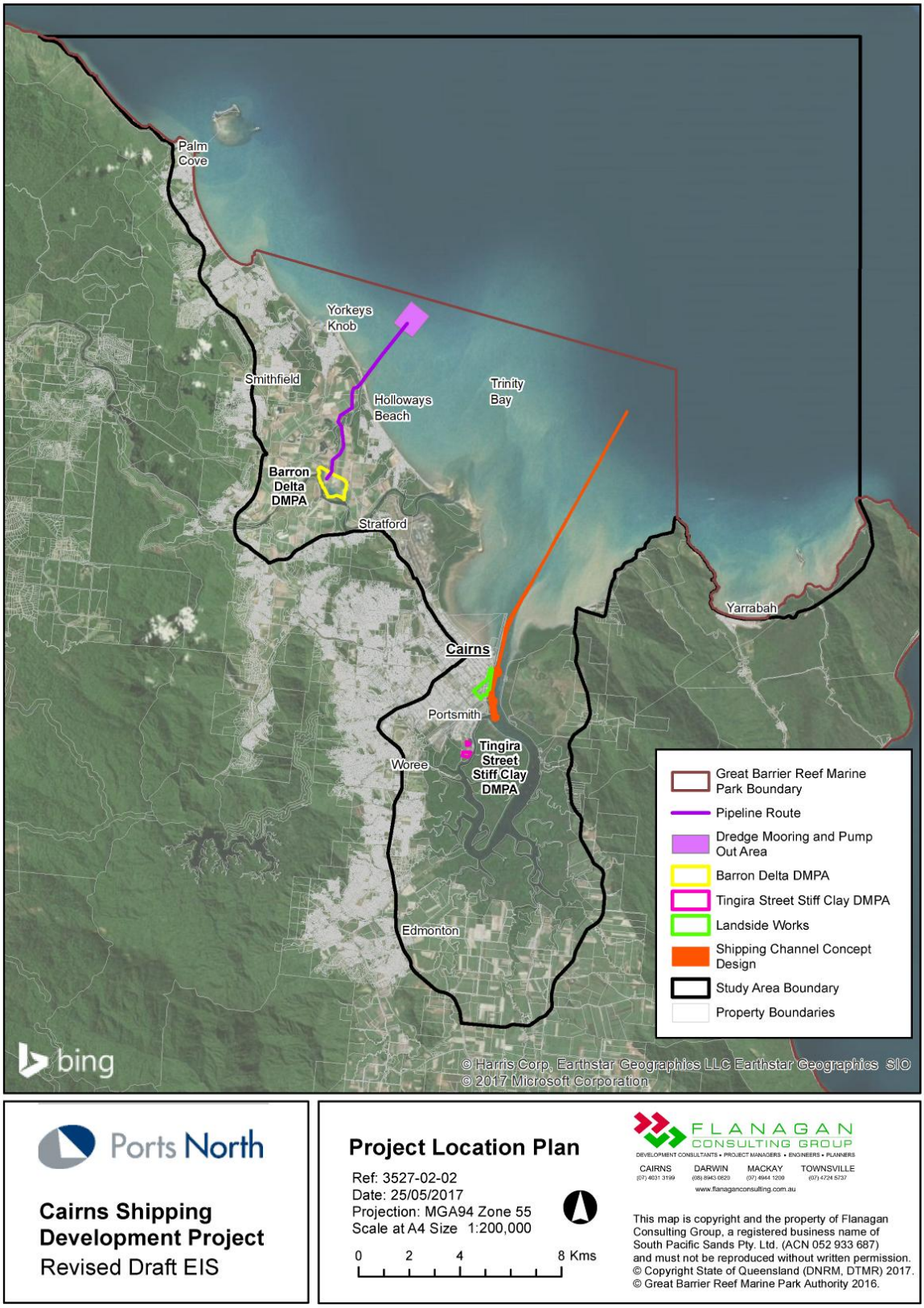
This Technical Study has been prepared to focus on the social impacts of dredge placement within two land placement precincts which will be the subject of the revised draft EIS. It is proposed that delivery of dredge material to these sites will be by pumping and the project includes inlet pipelines and tailwater management. It will also assess other social changes arising from redistribution of shipping between Cairns and Yorkeys Knob.

The placement sites are:

- Land placement of the soft clay component of the capital dredge material at Barron Delta (Northern Sands) Dredge Material Placement Area (DMPA) (an existing void in the Barron River delta created by past sand extraction and now used for burial of 'inert' construction and demolition fill).
- Land placement of stiff clays at previously reclaimed Ports North land at Tingira Street, Portsmith.

These sites are shown on the Project Concept Plan (**Figure 1**).

Figure 1. Project Area



Ports North

Cairns Shipping Development Project
Revised Draft EIS

Project Location Plan

Ref: 3527-02-02
Date: 25/05/2017
Projection: MGA94 Zone 55
Scale at A4 Size 1:200,000

0 2 4 8 Kms

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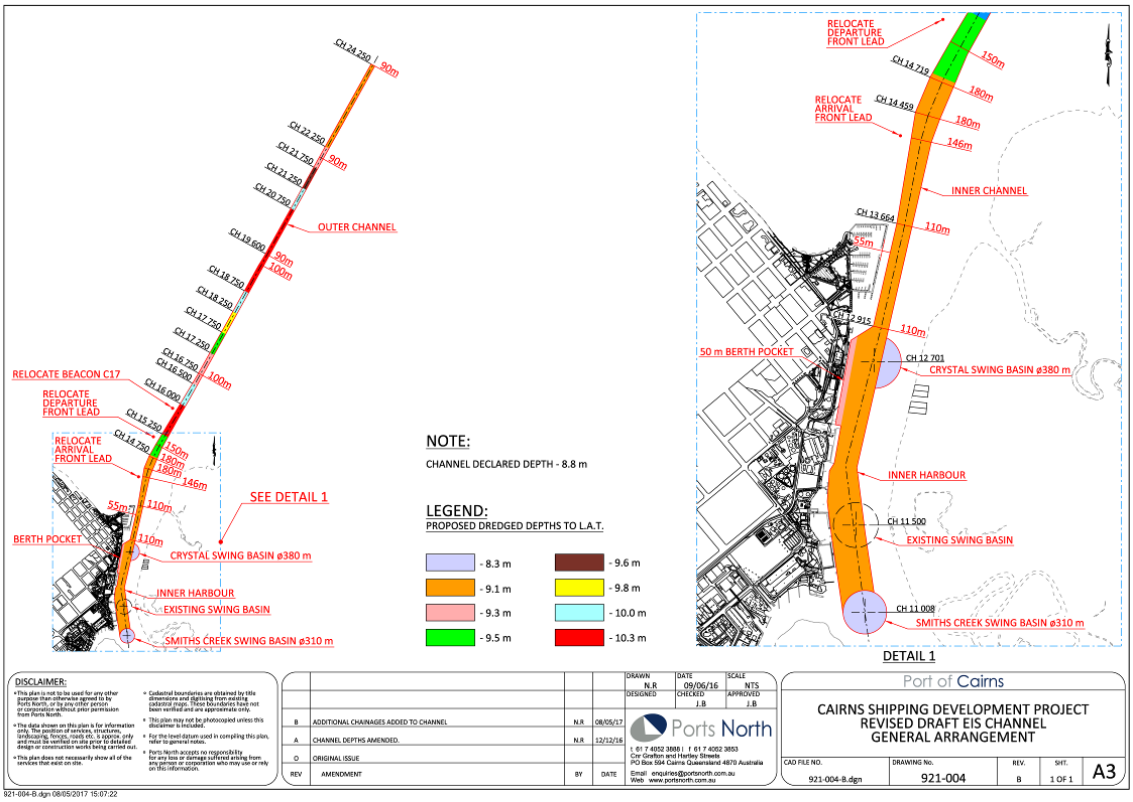
1.2 Description of the Proposed Project

The objective of the CSD Project is to accommodate larger cruise ships and a potential expansion of HMAS Cairns Navy Base through widening and deepening of the Cairns Shipping Channel and improvement of navigation and wharf facilities.

The channel design to be assessed in the revised draft EIS will involve the following elements (**Figure 2**):

- -8.8m Declared Channel depth
- Expanded Crystal Swing Basin to 380m
- Smith's Creek Swing Basin to 310m
- Outer Channel width 90 -100m
- Inner Channel width generally to 110m (outer bend to 180m)
- Further optimisation may occur at dredging contract negotiation stage.

Figure 2. Recalibrated CSDP Channel



Dredge material quantities include soft clays (710,00m^3, including 247,000m^3 Possible Acid Sulphate Soils (PASS) and 453,000m^3 (self-neutralising clays)) and stiff clays (80,000m^3).

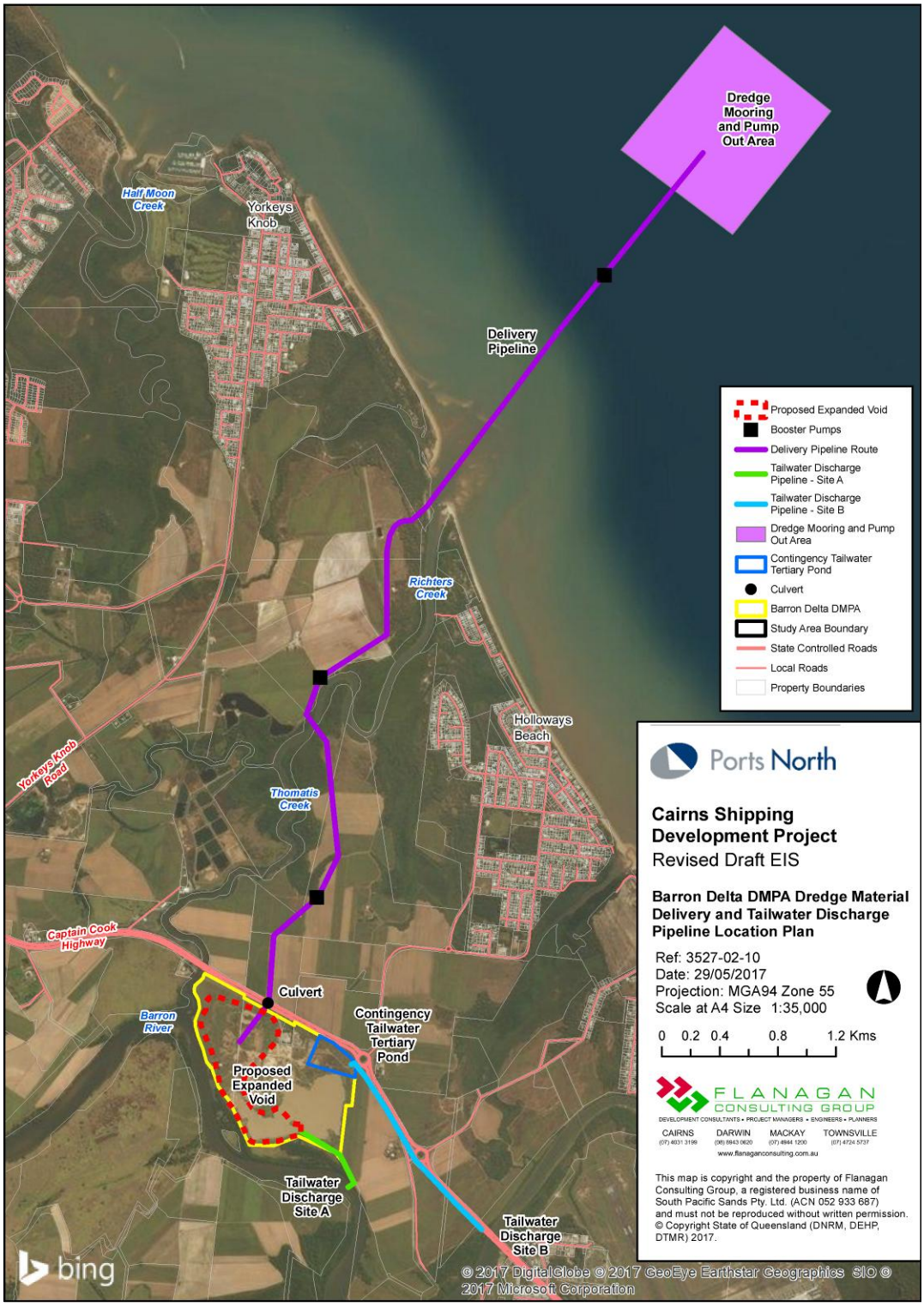
Soft clay dredge material is to be transported to a shore based Dredge Material Placement Area (DMPA) at the Northern Sands sand extraction operation on the Barron Delta. Stiff clay dredge material is to be transported to previously reclaimed Ports North land at Tingira Street, Portsmith.

The soft clays are to be dredged via a 5,600m^3 capacity Trailer Suction Hopper Dredge (TSHD) discharging to a temporary floating pump out facility between approximately 2.6 and 3.6 km NE of Yorkeys Knob.

Dredge material will be pumped from the pump out facility via a submerged steel pipeline, which will make landfall near the Richters Creek mouth, thence to the Barron Delta DMPA via cane farm headlands and Captain Cook Highway culverts (**Figure 3**).

Due to the 8km pipeline distance from pump out to the Barron Delta DMPA, up to three pipeline booster pumps will be required, depending on TSHD pumping capacity.

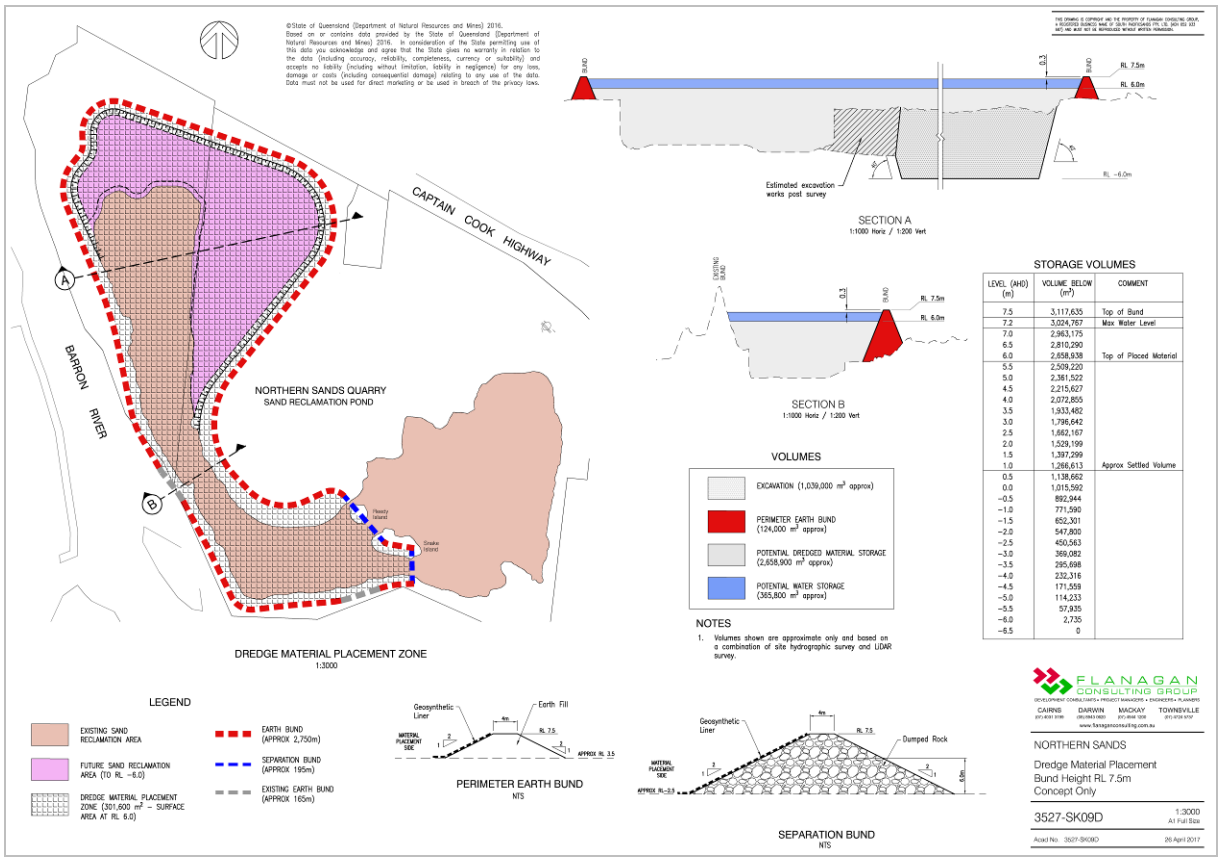
Figure 3. Barron Delta DMPA Location and Pipeline Concept



The DMPA will consist of the following elements as shown in **Figure 4**:

- Facility capacity required during placement is 2,400,00m^3. Material is expected to further consolidate with time to approximately 1,000,000m^3 (with additional void shaping, assumed final settled bed level at approximately 0.0m AHD)
- Temporary bunding to at least 100 year flood immunity plus freeboard (7.5m AHD), which will minimise risk of sediment remobilisation in the event of event exceedance
- Water volume above RL 6.0 approx. 350,000m^3 (allowing 300mm free board from top of bund)
- Sheet pile wall at Reedy/Snake Island to separate DMPA from southern sand pit
- Tailwater is proposed to be discharge adjacent to site or pumped to an outfall at the Barron River highway bridge.

Figure 4. Barron Delta Concept Design



It is proposed that the stiff clays will be transferred to shore in dumb barges via temporarily moored barge mounted excavators loading heavy haulage vehicles at the two barge ramps shown in **Figure 5** in the Tingira Street DMPA; minor earthworks including temporary piles may be necessary at the ramps to facilitate unloading.

Figure 5. Tingira Street DMPA

1.3 Methodology

1.3.1 Scope

This Technical Study has been prepared to meet the requirements of the Brief for Technical Studies Part B – Detailed Brief TS9: Social Impacts issued in March 2017 by FCG and Ports North in so far as it relates to changes from the previous proposal.

The revised draft EIS is required to meet the following:

- Terms of Reference (ToR) issued by the Coordinator General (Queensland) dated 30 November 2012.
- EIS Guidelines issued by the Commonwealth Departments of Energy and Environment (DoEE) / Sustainability, Environment, Water, Population and Communities (SEWPaC) dated 21 March 2013.

This Technical Study will form one input to the preparation of an SIA by FCG which meets those requirements. Accordingly, it has been prepared in accordance with the Queensland Government Department of State Development, Infrastructure and Planning (DILGP) Social Impact Assessment Guideline (2013).

The experience and qualifications of the author of the study to prepare an SIA are provided in Appendix 1.

1.3.2 Stages

The stages in the methodology adopted are summarised below.

1.3.2.1 Inception

An inception stage was undertaken involving a site visit to become familiar with the respective parts of the EIS study area, confirming the methodology and transferring information held by the FCG or the client.

1.3.2.2 Baseline Study

A baseline study of the existing environment was undertaken to profile existing conditions, characteristics and trends upon which assessment of social impact could be based. This included:

- review of the proposal, review of information received from the client, feedback from previous community consultation, and a literature review of other studies and reports to determine potential social issues and community values and aspirations
- establishment of the regional and local community structure and activity patterns
- a land use review of directly impacted and immediately neighbouring properties
- overview of local commercial and employment activities
- a demographic profile of potentially affected communities
- a description of the future community.

1.3.2.3 Review of Consultation

A review was undertaken of existing consultation findings, and a summary developed of key issues/benefits identified through consultation relating to potential social impact. This was supplemented by a review of the outcomes of targeted localised consultation undertaken by Ports North to inform the SIA.

1.3.2.4 Assessment

Potential social impacts (adverse and beneficial) were predicted and synthesised across each stage of the project lifecycle (construction and operation), informed by the baseline study and the feedback from consultation. Assessment was then undertaken of potential impacts and opportunities by considering the likely changes to the values of the affected areas. The mitigation measures inherent in the concept design were identified and considered.

Evaluation of the significance of the impacts on individuals, groups and communities was undertaken using a table of significance adapted for social impact. The likelihood of an impact occurring, and the likely risk of an impact occurring was evaluated by using a risk matrix (the product of significance versus likelihood).

1.3.2.5 Mitigation/Enhancement and Management/Monitoring Measures

Desirable mitigation/enhancement measures in design, construction, operation and maintenance phases which might minimise adverse social impacts and optimise social benefits, were identified. The level of residual impact was assessed following mitigation/enhancement measures.

Management/monitoring measures necessary to maintain the residual outcome were also identified, including indicators to measure the achievement of objectives.

A conclusion based on the above regarding the significance of the mitigated impact and consequences for the project was developed.

1.3.3 Consultation

Ports North engaged a range of stakeholders and community members during the preparation of the EIS for the project commencing in 2011-2012. The outcomes of these consultations relating to social matters were reviewed by the social consultant, and key individuals/groups or communities potentially affected, and key issues/benefits potentially arising, were identified.

In addition, the social consultant identified a number of additional consultations which it requested Ports North to undertake as part of its engagement program, in order to specifically inform the Technical Study. This included consultation in the two placement precincts, and in the vicinity of the pipeline.

Additional stakeholders consulted included:

- affected landowners

- Holloways Beach Environment Education Centre
- Cairns Regional Council (Infrastructure Services, Parks, Engineering and others).

Outcomes of the consultation were documented and summarised by Ports North for use by the consultant.

1.3.4 Study areas

Social impacts can be viewed at several geographic levels. Various definitions have been adopted for the purposes of this Technical Study, based on the following geographic boundaries:

- EIS Study Area - The Cairns Regional Council Local Government Area (LGA) (referred to as Cairns LGA), has been adopted as the EIS Study Area or where demographic information has not been available, the combined Cairns Regional Council and Douglas Shire Council LGAs (referred to as Cairns Douglas LGA) (**Figure 6**).
- Project Area – The Project Area has been defined for the purposes of the EIS as the area including the immediate footprint of the project, including the shipping channel, dredge material placement areas (DMPA) and wharf upgrades. They are as shown on **Figure 1** to **Figure 5**. The DMPAs are also shown in **Figure 7** and **Figure 8** below.
- Barron Delta (Northern Sands) DMPA Study Area – This comprises the lower 'Northern Beaches' area of Cairns, as well as areas extending up the Barron delta. For demographic purposes, a number of sub-areas have been reported on:
    - Yorkeys Knob
    - Holloways Beach
    - Machans Beach
    - Kamerunga
    - Caravonica (containing the Barron Delta DMPA itself).

  The Barron Delta DMPA Study Area is shown in **Figure 7**.
- Tingira Street DMPA Study Area – This comprises several sub-areas adjacent to and containing the Tingira Street DMPA. The majority of these are uninhabited or sparsely populated. Two sub-areas have been selected for further reporting:
    - The surrounding area of the Portsmith Industrial Area
    - The area opposite and nearby the Cairns Cruise Liner Terminal, called in this study the 'Wharf Street Area'.

  The Tingira Street DMPA Study Area is shown in **Figure 8**.

Where reference is made to the DMPA (Dredge Material Placement Area) itself, this refers to the actual sites identified in the previous section.

Figure 6. LGA Study Area

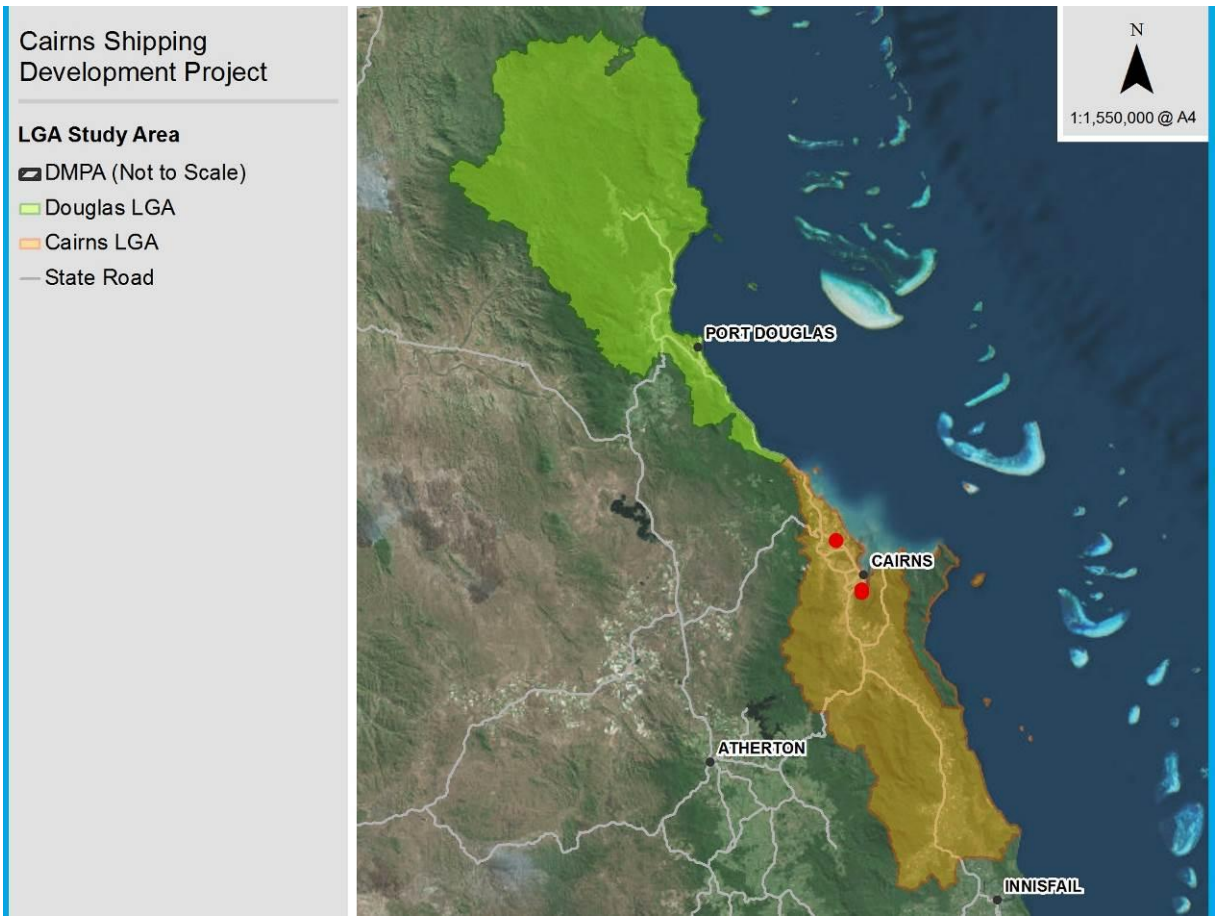
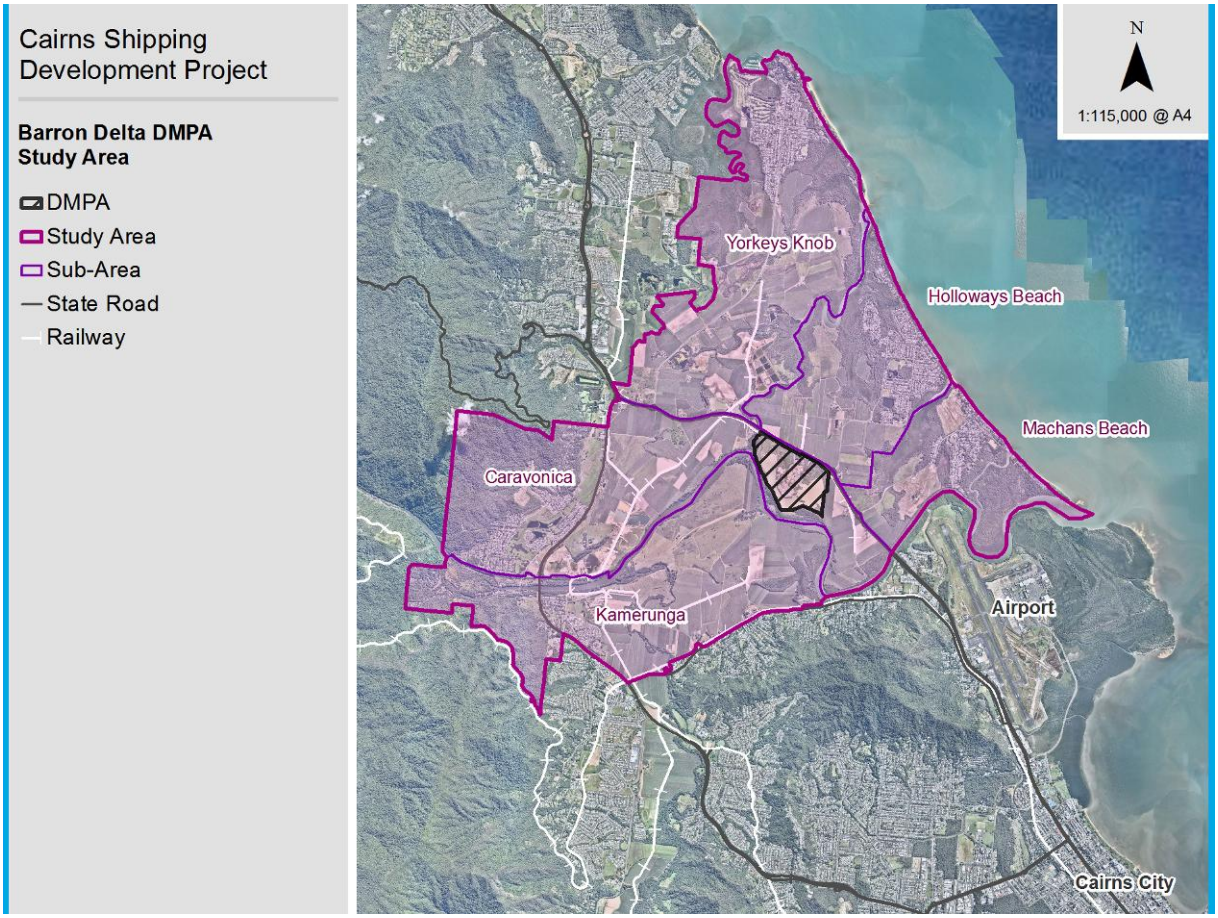
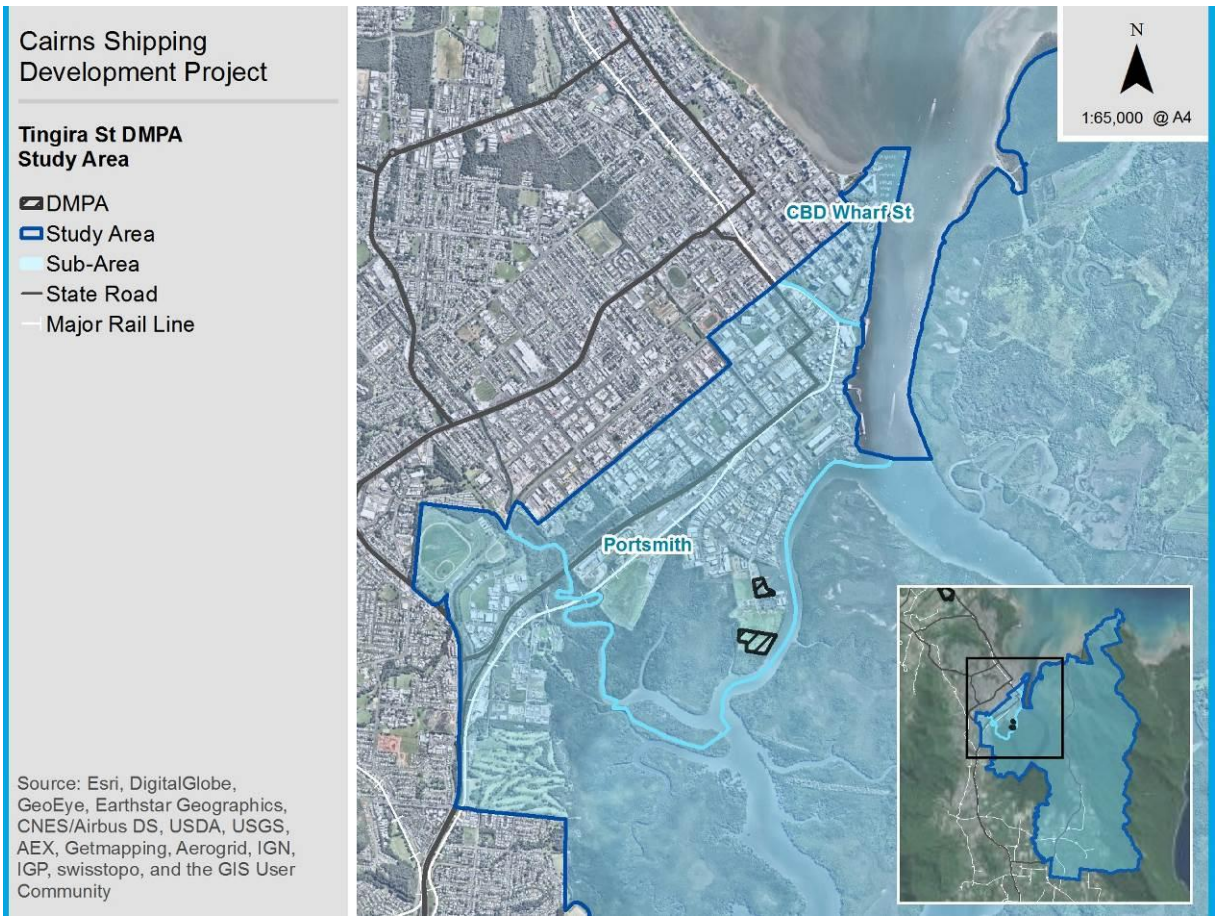


Figure 7. Barron Delta DMPA Study Area and Sub-Areas



Notes: Based on suburbs as defined in ABS ASGS 2011.

Figure 8. Tingira St DMPA Study Area and Sub-Areas



Notes: Based on SA1 areas as defined in ABS ASGS 2011. The inset map shows the extent of the study area to the east and south of the Tingira St DMPA Project Area.

2. Existing Baseline Situation

2.1 Policy Context and Legislative Framework

Policies, plans and strategies relevant to establishing the social context of the CSD Project and community values which may be enhanced or affected have been identified and summarised below.

2.1.1 National

2.1.1.1 The Reef 2050 Plan

The *Reef 2050 Long-Term Sustainability Plan* was released by the Australian and Queensland governments in March 2015 and is the overarching framework for protecting and managing the Great Barrier Reef until 2050. The Plan outlines management measures for the next 35 years to ensure the Outstanding Universal Value of the Reef is preserved now and for generations to come.

The Plan sets clear actions, targets, objectives and outcomes to drive and guide the short, medium and long-term management of the Reef. The Plan firmly responds to the pressures facing the Reef and will address cumulative impacts and increase the Reef's resilience to longer term threats such as climate change.

At the core of the Plan is an outcomes framework that will drive progress towards an overarching vision:

> *"To ensure the Great Barrier Reef continues to improve on its Outstanding Universal Value every decade between now and 2050 to be a natural wonder for each successive generation to come."*

The Great Barrier Reef is identified in the Plan as playing an important role in community life. Many people are seen to have strong connections to the reef through culture, occupation or familiarity. Human wellbeing – happiness, good health, and prosperity – is also seen to be inextricably linked to environmental health. People were also seen to derive less tangible benefits from healthy ecosystems, such as nature appreciation, opportunities for relaxation and enjoyment, and a better understanding of the complex natural world. The Reef also provides coastal residents with protection from wave action, especially in extreme weather.

The Plan seeks to ensure that community benefits derived from the Reef are considered in local and State-level policy and planning instruments and development and management decisions.

As an outcome of the Plan, the Australian Government has placed a permanent ban on disposal of material in the Great Barrier Reef Marine Park from capital dredging projects. In addition the Queensland Government has legislated to restrict capital dredging for the development of new or expansion of existing port facilities to within the regulated port limits of Gladstone, Hay Point/Mackay, Abbot Point and Townsville, and prohibit the sea-based disposal of dredge material from these sites in the Great Barrier Reef World Heritage Area (see Section 2.1.2.1).

2.1.1.2 Environment Protection and Biodiversity Conservations Act 1999

As the project was deemed by the Minister to require assessment under the Environment Protection and Biodiversity Conservations Act (EPBC Act) in relation to a number of matters of national environmental significance, the method of assessment is an EIS and Ports North is required to prepare the EIS according to the EIS Guidelines provided by the DoEE Minister. These guidelines include a requirement for a socio-economic assessment.

2.1.1.3 Great Barrier Reef Marine Park Act 1975

The *Great Barrier Reef Marine Park Act 1975* (GBRMP Act) is the primary Act in respect of the Great Barrier Reef Marine Park (GBRMP). It has provisions for the establishment of the Marine Park and the Authority responsible for its management (the Great Barrier Reef Marine Park Authority (GBRMPA)), the planning and management of the Marine Park, acceptable uses of the Marine Park and enforcement mechanisms for breach of these (Great Barrier Marine Park Authority, 2017).

Great Barrier Reef Marine Park Regulations 1983 (GBRMP Regulations) are the primary regulations in force under the Great Barrier Reef Marine Park Act 1975. A component of the project requires permission under the GBRMP

Regulations and therefore the GBRMP Act. To streamline the assessment process, the EIS Guidelines also include requirements for this permission to be assessed.

Great Barrier Reef Marine Park Zoning Plan 2003 (GBRMP Zoning Plan) is the primary planning instrument for the conservation and management of the Marine Park. Subsection 32(1) of the Great Barrier Reef Marine Park Act 1975 sets out that the Zoning Plan takes account of the World Heritage values of the Marine Park and the principles of ecologically sustainable use. The Zoning Plan aims, in conjunction with other management mechanisms, to conserve the biodiversity of the Great Barrier Reef ecosystem within a network of highly protected zones, and provide opportunities for the ecologically sustainable use of the Reef and access to the Great Barrier Reef Region (Great Barrier Marine Park Authority, 2017).

2.1.2 State

2.1.2.1 Sustainable Ports Development Act 2015

The *Sustainable Ports Development Act 2015* is the legislative framework developed by the Queensland Government to implement the main port-related actions of the *Reef 2050: Long-Term Sustainability Plan*. The legislation restricts new port development to areas within current port limits (or outside Commonwealth and State marine parks), restricts capital dredging for new or expanded port facilities to priority ports only (Gladstone, Hay Point/Mackay, Abbot Point and Townsville) (however there is a special exemption for the Port of Cairns, and the Port of Cairns Shipping Development Project as outlined below), and prohibits sea-based disposal of material generated by port-related capital dredging into the Great Barrier Reef World Heritage Area (GBRWHA).

Capital dredging relates to dredging for creating or enlarging channels, basins, ports etc., new port foundations, or laying pipe, cable or tubing, rather than for maintenance of existing channels, basins, ports etc. (or protecting human life or property).

As well as allowing capital dredging in priority port areas, the legislation permits limited capital dredging within the Port of Cairns' inner harbour to a total of no more than 50,000 cubic metres per approval and a total limit of 150,000 cubic metres in a four-year period. There is a further exemption of this provision for projects which are the subject of an ongoing EIS process started before the commencement of the Act, which includes the CSD Project.

However, the Act prohibits capital dredging where dredge material is deposited or disposed of in a restricted area including the GBRWHA, unless used for land reclamation, beach nourishment or environmental restoration. There are no exemptions to this requirement.

2.1.2.2 State Development and Public Works Organisation Act 1971

The project has been declared a coordinated project for which an EIS is required. A separate set of guidelines were issued by the Queensland Government for this assessment, namely the ToR. The ToR require that a social and economic impact assessment is undertaken and included in the EIS.

2.1.2.3 Far North Queensland 2009-2031 Regional Plan

The *Far North Queensland 2009-2031 Regional Plan* (FNQRP) remains the current Queensland Government strategic planning document for Far North Queensland. It is noted that the Queensland Government is in the process of updating the state's regional plans. The FNQRP highlights the Port of Cairns as a key node for the development of tourism in the region.

2.1.2.4 Advancing Tourism Plan 2016-2020

Advancing Tourism is the Queensland Government's plan to attract more visitors to the state. It identifies a number of key competitive advantages of Queensland including: diversity in products and experiences; iconic natural assets that offer unique experiences; accessibility through strong transport connections, safe, clean and green environment; and close proximity to Asia.

The Great Barrier Reef is identified as a natural asset that can support new and refreshed ecotourism and nature-based tourism products and experiences. Indigenous and cultural tourism products, events and experiences are also identified as an area for growth.

Encouraging private sector investment in key cruise ship ports is identified as an action to improve access to tourism transport and infrastructure. Also related to the cruise ship market is an action to undertake a study to investigate opportunities around superyachts and investigating the economic contribution that base porting in Queensland could provide.

2.1.2.5 Advancing Tourism Plan 2016-2020: Advancing Tourism in North Queensland

A supplement to the Advancing Tourism Plan, the Advancing Tourism in North Queensland Strategy provides specific actions for the North Queensland region.

The Great Barrier Reef is again noted as an important tourism draw-card for the region, and supporting cruise and other maritime infrastructure is again noted as an action.

2.1.2.6 Draft Queensland Tourism and Transport Strategy 2016

Acknowledging that transport is an important component of a successful tourism industry, the Queensland Government developed a transport strategy to improve access to places around Queensland for visitors. The strategy was released as a draft in 2016, and a final version is due to be released responding to feedback in mid-2017.

The cruise ship market is identified as one of the fastest growing sectors of the tourism industry in the strategy, and aviation and cruise infrastructure are therefore considered priorities in the strategy. The Port of Cairns is identified as a key cruise port in Queensland supporting the cruise market which is one of the fastest growing travel sectors.

As well as actions on improving visitor information, transport services, and ticketing and products, the strategy identifies actions on planning and investment to encourage long term tourism growth which include actions related to the cruise ship market. The actions include:

- Supporting the development of the cruise shipping ports by continuing to encourage private sector investment in the industry and developing a prioritised list of opportunities to optimise long-term growth
- Capitalising on cruise industry market opportunities by studying potential economic impacts of superyachts, highlighting economic contribution of base porting, and providing a coordinated approach to cruise shipping across Queensland Government.

2.1.3 Local

2.1.3.1 Cairns Regional Council Corporate Plan 2013-2018

The Corporate Plan is an overarching strategy to guide CRC decision making in annual budgets and operational plans and is updated every five years. The vision for the Cairns region includes valuing the natural environment, lifestyle and surroundings; supporting and respecting distinctive and vibrant communities; being innovative and creative; and growing and diversifying the economy.

Economic development is identified as a key priority for CRC. A multi-pronged approach to achieve sensitive and sustainable economic development is outlined, including a focus on diversifying the economy with emphasis on both tourism and agriculture, as well as a various other sectors.

Protection of productive rural land from urban encroachment is also mentioned in the planning for the future priority area.

Other priority areas include regional cooperation, infrastructure management, arts and culture, disaster management, environmental management, community health and wellbeing, and community services and public safety.

A number of strategic goals are outlined based on the quadruple bottom line approach to governance:

- Community: A vibrant, inclusive and healthy community with access to services and facilities which reflect its unique character, role and needs

- Economy: A strong, diversified and sustainable regional economy that supports the growth of new and existing industry and business activities whilst enhancing local lifestyle and providing long term employment opportunities
- Environment: A sustainable, well managed and healthy environment that provides a balance between built infrastructure and the conservation of our world heritage features and natural and cultural resources
- Governance: An efficient organisation providing best practice service delivery through leadership and policy making and the effective management of people, assets and finances.

2.1.3.2 Cairns Regional Council Cairns Plan 2016 Strategic Framework

A new planning scheme for the Cairns region was adopted by CRC in February 2016 and commenced on 1 March 2016. The strategic framework section of the Cairns Plan 2016 includes a vision for the region to 2031 which includes the following vision elements:

- the region is internationally renowned for its natural beauty, outstanding biodiversity values and unique tropical lifestyle attracting international visitors, domestic visitors and new residents
- the community is cognisant of natural hazards and climate change and this influences land use planning and decision making
- growth is consolidated within the identified urban area
- rural land is protected and is used for rural purposes
- the region has a diverse and thriving economy complementing environmental values. Tourism and primary production remain substantial economic drivers and employers, however other industries have contributed to a diverse economy
- the built environment is characterised by tropical design and natural surrounds
- the Cairns City Centre is the capital of commerce and services for Far North Queensland, Cape York, the Gulf Country, Papua New Guinea and the wider South Pacific region.

2.1.3.3 Port of Cairns Land Use Plan

Ports North prepares land use plans for strategic port land under its control which are approved by the State Government Minister of Transport. Assessment of development on strategic port land is then undertaken according to the approved land use plan and planning legislation (*Sustainable Planning Act 2009* and Sustainable Planning Regulation 2009).

The Land Use Plan aims to encourage sustainable expansion of port holdings, facilitate the integration of port interests with State and local government interests, provide a basis for assessing development applications, and provide government, residents and businesses with confidence about future development on port held land.

It has separate local area plans for Cityport and Seaport (**Figure 9)**. Cityport is the area of the port that is north of around Draper St and Seaport is the section south of Draper St. This distinction relates to the different focuses of activities in these areas – with Cityport being a major part of the Cairns waterfront for use by residents and visitors, and integrating with the Cairns CBD, and Seaport being used for a diverse range of strategic port industries.

The vision for the Cityport area is that it is a 'functional, dynamic and cohesive urban waterfront precinct that is distinctive' including a diverse range of uses and activities that complement the Cairns CBD. It notes that Cityport provides a world standard international cruise ship terminal and reef fleet tourist vessel facility reinforcing the reputation of Cairns as the gateway to Far North Queensland and the Great Barrier Reef. The area will retain views to and from the waterways, provide pedestrian routes, and provide distinctive tropical Cairns landscape and built form.

Precincts 4 and 5 are immediately adjacent to the cruise ship terminal. The land use plan for Cityport notes that these precincts are gateways into Cityport, and any development in this area will focus on tourist activities and short term accommodation. Mixed use buildings of around 6-10 storeys are envisaged on these sites.

The Cityport area includes several existing buildings which are intended to be retained: Cairns Convention Centre; Hilton Hotel; Radisson Hotel and the Pier Shopping Centre and several heritage buildings. The landside construction areas are located within Cityport.

Figure 9. Port Land - Cityport and Seaport

Source: Ports North 2013, *Land Use Plan: Seaport Local Area Plan* and *Cityport Local Area Plan 2006 (Amended March 2013)* accessed 13 April 2017, http://www.portsnorth.com.au/planning/landuseplans.php

The Tingira St DMPA is located within the Seaport area and therefore the Seaport Local Area Plan volume is relevant. The vision for the Seaport area is that development will 'enhance and maintain the operation and commercial viability of the port', and 'maximising available wharf space and support areas as well as the flexibility of their use', among a number of other vision elements.

The Tingira St DMPA is located within areas designated as Waterfront Industry Planning Area and Industrial Planning Area. The intent of the Waterfront Industry Planning Area includes:

> *The Waterfront Industry Planning Area will incorporate a diverse range of marine orientated industrial uses including low-impact industrial and port activities, including shipyards, ship maintenance, fishing bases, commercial fishing operations and marinas, barge ramps, vessel storage and harbour operational and port service activities.*
>
> *Existing shipyards, dry dock/ship repair operations, general cargo and the commercial fishermen's base are located within the waterfront area of this planning area. The continued operation and expansion of these marine orientated industries and activities is encouraged. Recreational uses such as boat clubs are also envisaged in this area.*

Future development within this area should not compromise the operation of the port or the environmental qualities of Trinity Inlet and Smith's Creek.

The intent of the Industrial Planning Area includes:

The Industrial Planning Area is located on the western side of Tingira Street and does not have direct access to the waterfront. It is envisaged that an Industrial Business Park will be developed in this planning area with linkages to the Waterfront Industry Planning Area.

This planning area is intended to provide for a range of activities that support the primary activities and operation of the port. Such activities include general industries, low-impact industries, storage premises, and warehouse and distribution uses. Commercial and office support activities may also be appropriate depending on their scale and location.

This planning area adjoins a substantial conservation area to the south and any future development should be designed to minimise any potential impact on this area.

Therefore regardless of the project, the Tingira St DMPA Study Area is likely to continue developing for strategic port uses and/or as industrial uses to service the port.

2.1.3.4 Cairns Community Plan – Your Community Plan 2011-2031

The community plan was developed during 2010-2011 as a requirement of the Local Government Act at that time. Development of a community plan is no longer a requirement for local government and it has not been updated since 2011.

Broad community consultation was undertaken for the development of the community plan including workshops, online surveys and forums, postcards, letters and other forms. In total, around 2,500 pieces of public feedback were received. The community vision, aspirations and values outlined in the plan are therefore considered to remain of relevance.

The relaxed laid-back lifestyle of the region is noted as an asset attracting residents to the region. It was suggested that Cairns has the amenities of a city, with the feeling of a big country town which was considered a feature that residents valued. Other characteristics valued by the community noted in the plan included: the diverse culture and history; multicultural and cosmopolitan community; vibrant arts sector; outdoor lifestyle encouraged by the local climate; natural setting of the lush wet tropics (including green hill sides, tablelands, reefs, ocean and rainforests); and focus on sustainable living.

The vision for Cairns in 2031 includes elements that may be relevant to the proposal such as:

- renowned as a great place to live and visit
- world-class infrastructure
- living in social and environmental harmony including sustainable living
- diverse community enriches the cultural landscape and contributes to economic growth and celebrations
- sense of community/community spirit
- outdoor recreation
- safe places and spaces
- robust economy for enterprise
- tourism will remain a significant driver and substantial employer but other industries will provide a diverse economy. Networks or clusters will result from collaboration between business, education and research institutes
- connected region
- global centre of wet tropics living and industry – drawing thinkers, entrepreneurs, businesses, environmentalists, humanitarians, etc.

- appreciation and respect of the natural environment, including learning from traditional owners
- live close to nature and minimise environmental impact.

Desired outcomes outlined in the report are summarised under six themes. The desired outcomes of relevance include:

- Community
  - Includes strategies focused on education and health
  - Social equity including extra attention for disadvantaged communities/neighbourhoods
  - Safety and security strategies
  - Providing community places to enhance participation and wellbeing.
- Culture, lifestyle, people
  - Maintain the relaxed, laid back outdoor lifestyle within the context of a large and growing population
  - Ability to interact with diverse natural environment
  - Meet needs of ageing population.
- Economy
  - Diverse, sustainable, low-carbon, resilient economy
  - Expanding existing employment and economic bases, while encouraging new opportunities such as agriculture, aviation, clean energy, marine, manufacturing, mining and mining services, culture, lifestyle, education and tropical expertise
  - *Maintaining the Cairns Seaport as a major refit and maintenance base as well as a marine training location for Queensland TAFE, with a commercial fishing and an Australian Navy base, a thriving super yacht industry, and as the largest concentration of dive tourism industry in the country.*
  - Retaining agricultural land for food production and agriculture
  - Build tourism including nature-based tourism and best-practice sustainable nature conservation, and diversification into sport, adventure, cultural and business tourism opportunities. Tourism to focus on natural environment, vibrant cultures and related businesses as opportunities
  - Marketing laid-back lifestyle as a must-see destination to domestic and international markets
  - *Expanding marketing campaigns for our region as a major cruise ship port.*
- Natural environment
  - Internationally renowned for natural wonder, biodiversity values and sustainable living
  - Mitigation of environmental impacts of population growth
  - Minimise impacts of climate change
  - Protecting built and natural heritage.
- Urban environment and built form
  - Infrastructure for self-contained functioning suburbs
  - Diverse and unique communities
  - Exemplar of holistic sustainable living in tropical environment.
- Governance
  - Active participation of community in governance
  - Network of community leaders.

2.1.3.5 Cairns Regional Council Community Development Strategic Plan 2011-2016

The Cairns Regional Council's Community Development Strategic Plan focuses on the five years from 2011 to 2016. It is proposed to be reviewed in the 2016/17 operational year.

The plan aims to:

- respond to social inclusion and community development priorities highlighted in the Council Corporate Plan

- set clear directions as to how these priorities will be achieved, measured and monitored
- strengthen the capacity of the community development unit of Council to better meet the needs of vulnerable groups in the community who traditionally have difficulty being heard.

The CRC has a vision for the future where the region thrives and inspires in the way it balances economic development, environmental management and social wellbeing. This plan supports that commitment to deliver the community outcome priorities expressed in the Corporate Plan.

2.1.3.6 Cycling and Walking Strategy: Network Plan 2010-2030

The Cairns Regional Council Cycling and Walking Strategy Network Plan sets the strategic direction for the delivery of walk and cycle infrastructure in the region. It includes a network map showing proposed walk and cycle routes throughout the entire Cairns region including functional route hierarchy, design guidelines for bikeways, an implementation plan and an implementation toolbox.

The connection between Yorkeys Knob and Holloways Beach is identified as a future route as part of the Northern Beaches cycling route, and two options are identified (**Figure 10**). Both of the potential routes pass through the study area for the Barron Delta DMPA.

The two options are:

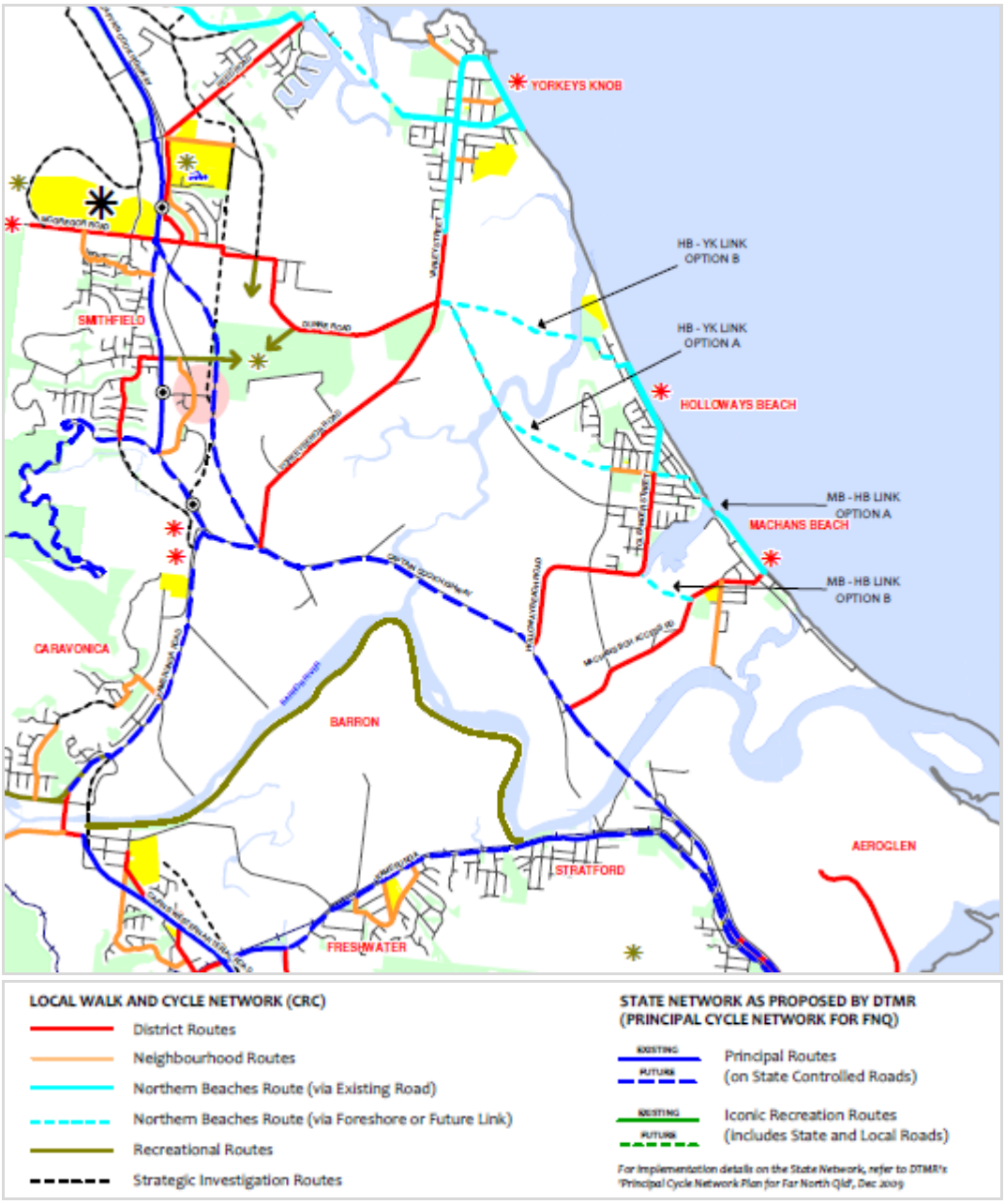
- Option A: Integrate walk/ cycle facilities with proposed future road (between Cassia St - Yorkeys Knob Rd/ Dunne St)
- Option B: Exclusive pedestrian/ cycle bridge crossing of Thomatis Creek downstream of the boat ramp near Acacia St.

The Northern Beaches Route is identified as a key project in the network plan to provide a continuous walking and cycling link from Machans Beach to Palm Cove to deliver a unique recreation and tourism experience:

> *Ongoing development of the 'Northern Beaches Route' to provide a continuous walking and cycling link from Machans Beach to Palm Cove – this long range strategy seeks to deliver a unique recreation and tourism experience, showcase the beaches and service local destinations on-route. It will be established with urban growth over time and utilise a mix of foreshore open space (where possible), road-based links, local parks and other open space. Some sections will be subject to detailed planning, environmental, engineering and feasibility investigations e.g. creek crossings.*
>
> *Low key measures to enhance the pedestrian and cycling environment through beach esplanades e.g. meandering paths in foreshore parks, advisory treatments for on-road cycling, route signage and branding.*

Branding of the route, route signage, network maps and interpretive opportunities on-route are suggested to enable promotion of the route as a tourist attracting feature of the region, and opportunities to provide bike facilities at strategic locations and activity nodes are suggested to encourage use of existing activity nodes by cyclists.

Figure 10. Walking and cycling network, Northern Beaches



2.1.3.7 Yorkeys Knob Foreshore Improvement Plan 2015

Council engaged GGI Landscape Architects to undertake stakeholder consultation and develop a new vegetation management plan and foreshore redevelopment plan for the Yorkeys Knob esplanade area. The study area included all of the foreshore area adjacent to Sims Esplanade from Yorkeys Knob Foreshore Park to the north and Goodwood Park to the south.

The southern section of the study area is closest to the Barron Delta DMPA and is around 900m to the north of Thomatis Creek. The southern section of the study area is suggested to remain as a mostly natural setting, with only a few improvements to the beach access area around Kempton Street including:

- new outdoor fitness equipment (one of three locations in the study area)
- picnic area with barbeque
- nature play zone

- all abilities access to the beach
- new bike parking, seating, water connection (shower, drinking water), bin and signage
- possible future connection with the Northern Beaches cycleway to the south.

Figure 11. Yorkeys Knob Foreshore Improvement Plan, Southern section

Key

1. 3m wide esplanade path weaves through shading parkland
2. New outdoor fitness system location 3
3. New picnic area and barbeque, proposed planting as beach arrival statement
4. Proposed future nature play zone
5. Proposed all abilities access to beach look out deck
6. New bike parking, seating, water connection, bin and signage
7. Proposed Goodwood Park feature planning and statement signage
8. Proposed Goodwood Park information platform, interpretive signage and framed views
9. Possible future connection to Northern Beaches Cycleway.

2.1.3.8 Draft Holloways Beach Foreshore Improvement Program 2017

Cairns Regional Council has proposed improvements to part of the Holloways Beach foreshore (Otium Planning Group and Landplan Landscape Architecture 2017). The foreshore improvements relate to around 750m of foreshore from where Casuarina St meets Poinsettia St in the north, to Oleander St in the south. These were put forward to the community in April 2017 as draft improvements for community feedback.

Positive features of the foreshore noted in consultation undertaken for the project included the natural intrinsic value of the foreshore, the facilities installed (including playgrounds, toilets, barbeques and seating), the quiet family nature of the foreshore, and the dog friendly nature of the foreshore. Main issues related to unsociable behaviour, erosion, and drainage and that any improvements would contribute to over-development of the area.

Consultation with local stakeholders to inform the draft strategy noted that at least one respondent felt that the amount of dredging that is occurring in the surrounding area should be reduced (although no further details were

provided). One respondent suggested that sand replenishment was needed at the Thomatis/Richters Creek end of the beach.

It was noted that Holloways Beach often undergoes beach nourishment:

> *Holloways has had major issues with erosion and loss of foreshore areas in the past. Several structural and replenishment efforts have been undertaken with rock walls to the south of the main beach area and the use of geo-fabric groynes near the swimming area.*
>
> *In 2008 the worst beach erosion was much further north in front of the park (right back into the grassed area, 2 m out from the first barbeque). CRC placed over 35,000 m^3 of sand dredged from Richters Ck, half of which went in north of Oleander St. In 2009 further nourishment was undertaken (18,000 m^3) with sand trucked down the beach from the dredge at Richters Creek. Some of that sand went on the beach north of Oleander St. There has been sand replenishment as far up as the Environmental Centre.*

Recommendations of the plan included activating the northern end of the foreshore study area, including providing formalised parking, exercise nodes, barbeque and shelter to increase use:

> *It is important to activate the northern section of the foreshore. This can be achieved by providing recreation opportunities at the northern most section of the study area. A BBQ/ picnic shelter would provide the local community another location to gather and would active the space. If complemented with other elements it would add significant recreation value for residents.*

It was noted that pathways along the foreshore should be a minimum width of three metres to ensure that the path can serve as part of the Northern Beaches Leisure Trail, which is a proposed cycleway connecting the Cairns CBD with Palm Cove and identified as part of the principal cycle network for Far North Queensland. Proposed options for the alignment of the Northern Beaches Leisure Trail between Yorkeys Knob and Holloways Beach were included as part of a literature in the Foreshore Improvement Plan (shown in Figure 29 below) however no additional information about the preferred alignment or timing of work on the Northern Beaches Leisure Trail was included.

There is a further Council proposal to create a long-distance mountain bike and walking trail from Palm Cove to Port Douglas which is referred to as the Wangetti Trail Project. This trail would connect to the Northern Beaches Leisure Trail.

2.1.4 Other relevant strategic plans

2.1.4.1 Tropical North Queensland Tourism Opportunity Plan 2010 - 2020

The *Tropical North Queensland Tourism Opportunity Plan* provides direction on the sustainable development of tourism in the TNQ region. It lists the upgrade of the Cairns Cruise Liner Terminal (CCLT), which was completed in 2010, and the upgrade of the shipping channel, as key opportunities to grow cruise tourism.

2.1.4.2 Tropical North Queensland Regional Economic Plan 2011-2031

Advance Cairns' *Tropical North Queensland Regional Economic Plan 2011-2031* (TNQREP) outlines a 20-year economic vision for the region built through consultation with key economic stakeholders in Far North Queensland. It sets out a vision to become 'The World's Leading Sustainable Tropical Region'. This will be achieved through:

- a strong and confident tropical economy
- an enriched lifestyle in liveable communities
- a natural and built tropical environment which is enjoyed, protected and enhanced.

The project is listed in the TNQREP as an activity to strengthen and diversify the region's tourism industry and destination appeal.

2.1.4.3 Regional Development Australia Far North Queensland and Torres Strait Roadmap 2013-2016

Regional Development Australia (RDA's) *Far North Queensland and Torres Strait Roadmap 2013 – 2016* (FNQTSRM) sets out a number of regional focus areas which include:

- expanding the region's outside earnings
- ensuring social services and infrastructure are at levels appropriate to the population
- re-establishing confidence in the region's future opportunities
- leveraging opportunities to enhance employment opportunities for the region's Indigenous population
- ensuring long-term planning commitments from governments to tackle water and energy security and climate adaptation measures.

FNQTSRM recognises that strong growth in the cruise ship market in Australia offers an opportunity for the region as an existing major cruise ship port. However, this growth has been accompanied by an increase in the size of cruise ships. It recognises that Cairns has a major challenge to achieve the deepening of the harbour channel and port anchorages to accommodate these larger cruise vessels.

The upgrade of the shipping channel and associated port infrastructure is identified as a key infrastructure asset needed for social and economic development and future sustainability of the region.

2.1.4.4 Tropical North Queensland Destination Tourism Plan 2014

Tourism Tropical North Queensland developed a tourism plan for the area to assist in achieving an increase in regional tourism expenditure by $2 billion per year from 2012 to 2020. The Tropical North Queensland region recognises that tourism is supported by natural assets including the Great Barrier Reef. The five 'hero experiences' for the region are the Great Barrier Reef, the world's oldest tropical rainforest, tropical lifestyle and culture, adventures, and Aboriginal and Torres Strait Islander people.

The CSD Project is identified as a major tourism-related infrastructure project for the region creating future opportunities. Actions are identified to 'Grow a portfolio of Cruise Liner port visitation schedules and Cairns home porting' and 'Grow superyacht visitation'.

2.2 Description of the Social Environment of the Study Areas

2.2.1 EIS Study Area

Cairns is the urban heart and key economic centre of Far North Queensland. It is the capital of commerce and services not just for Far North Queensland, but also Cape York, the Gulf Country, Papua New Guinea and the wider South Pacific region (CRC, 2016). Cairns role extends into health care, government, retail and other services, with major providers such as Cairns Base Hospital established in the Cairns CBD.

Cairns is an internationally significant tourist destination offering connection to the Great Barrier Reef and tropical rainforests. The Port of Cairns is a key cruise port in Northern Queensland, along with ports in Port Douglas, Townsville and Airlie Beach. Cairns is also the location for the region's major airport, with Cairns Airport servicing both domestic and international aircraft. In 2015/16 more than 5 million passengers travelled through Cairns Airport (Cairns Airport 2017).

The Cairns LGA is located on coastal land between the Great Dividing Range and the Coral Sea. The World Heritage Wet Tropics rainforest is located to the west and north, and the Coral Sea and GBRMP to the north and east. The Cairns CBD is located directly adjacent to the Port of Cairns.

As outlined in Tourism Tropical North Queensland and Tourism Queensland's *Tropical North Queensland Tourism Opportunity Plan 2010-2020* (2010):

> *"Cairns city is situated along the foreshore of the Coral Sea and Trinity inlet. It is an established tourism destination of global significance and acts as the region's hub for tourism. Other destinations within Cairns include Palm Cove and Kuranda which have substantial existing tourism infrastructure. As a hub for the region it*

also is the key centre for tourism related industry including retail and business events. Equipped with an international airport and a busy cruise port with over 200 international and domestic cruise ship visits a year, Cairns provides the base from which many visitors explore Tropical North Queensland. It hosts a wide variety of accommodation options ranging from backpacker hostels through to five star hotels. Tours to the rainforest and Great Barrier Reef depart daily from Cairns' major accommodation providers. A large number of community, cultural and tourism related festivals and events are also based in Cairns. It is also home to the Cairns Convention centre which has very good existing capacity and capability to host tourism related events. The recent redevelopment of Cairns foreshore 'esplanade' has incorporated excellent community space including pools, recreation and sporting facilities."

2.2.2 Project Area

The Port of Cairns is situated on the western bank of Trinity Inlet, a mangrove-lined estuary to the west of the city of Cairns on the border of the Cairns CBD. Trinity Wharf is the location of the CCLT. The land immediately surrounding the port is a mix of industrial and commercial uses. East Trinity Reserve, an undeveloped environmental reserve, lies opposite the port on the eastern side of Trinity Inlet, providing a green backdrop to the city of Cairns. The current Port of Cairns navigational channel extends into Trinity Bay, which forms part of the Coral Sea.

To maintain its defined dimensions, the Port of Cairns' shipping channel is dredged annually. This maintenance dredging has been undertaken each year since the Port opened. Ports North currently has approval from the Great Barrier Reef Marine Park Authority (GBRMPA) to place the material from this maintenance dredging in a location (the DMPA) approximately 12 kilometres offshore. Ports North has placed dredge material in this location for the past 20 years and estimates that approximately 6.5 million cubic metres of dredge material has been placed in this location to date. The location of this DMPA is recorded in marine mapping. A Notice to Mariners regarding the dredge activity is issued to advise other vessel operators to proceed with caution around the operating dredge vessel.

2.2.2.1 Barron Delta DMPA Study Area

The Barron Delta DMPA Study Area as defined in **Figure 7** is located in the suburb of Barron, which is a mainly rural area to the north of the Cairns urban area on the Barron Delta. The Barron River winds through the area and most of it is relatively low lying and subject to flooding in a flood event. Surrounding uses are mainly agricultural (including aquaculture and cane farming), with some other uses along the Captain Cook Highway, such as the Northern Sands quarry (the site of the DMPA) and a motorcycle track and Go-Kart track and Laser Tag Arena entertainment facility.

The Northern Sands site lies on the western side of the highway and is accessed directly from it by a gravel driveway in poor condition. The site contains several uses:

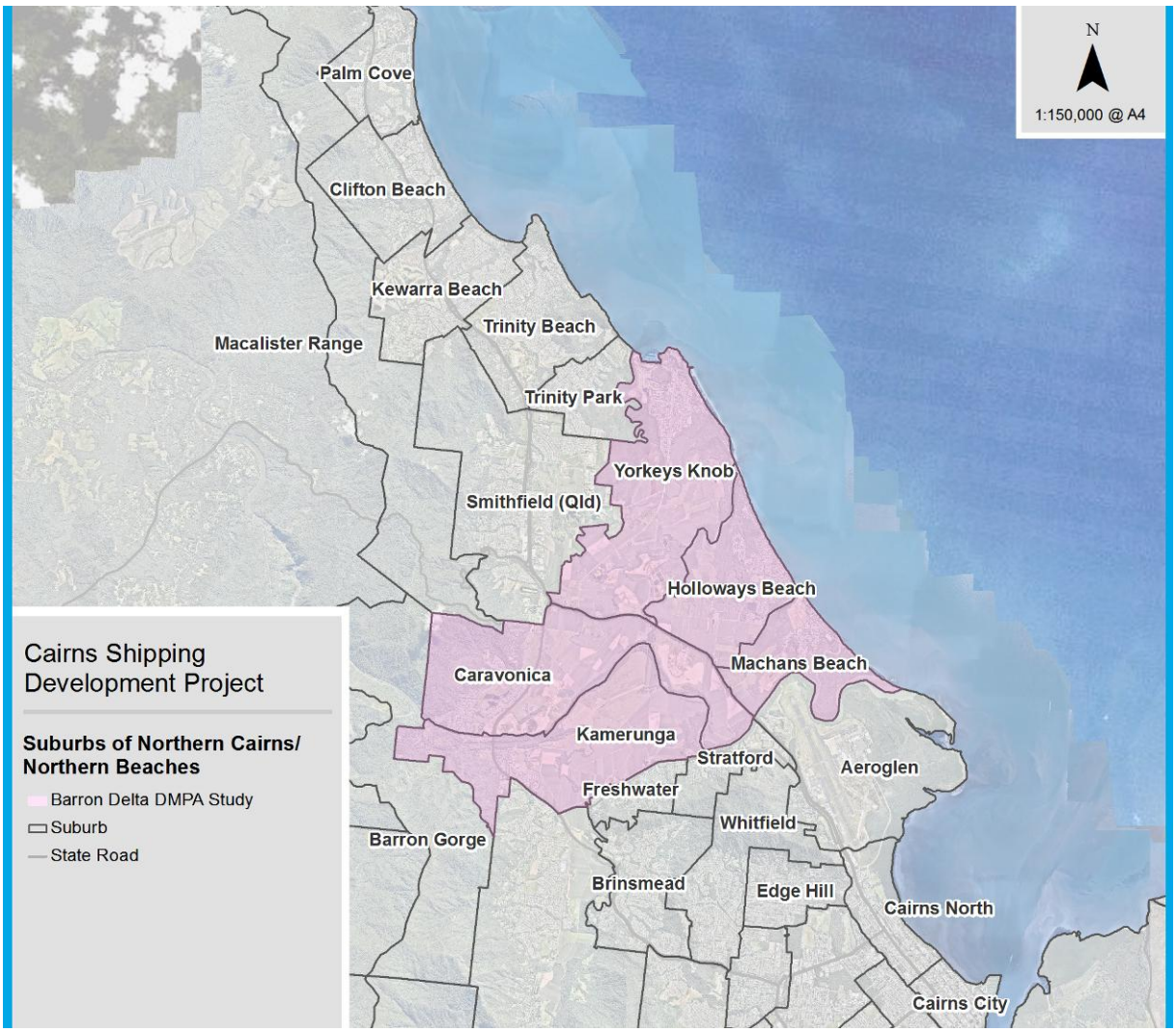
- the sand mining operation
- a Boral concrete batching plant
- a commercial dump.

Other than for scattered residences such as farm houses, there are no nearby urban settlements.

The Northern Beaches suburbs of Holloways Beach and Machans Beach are located to the east of the site, and are each separately accessed from the Captain Cook Highway. Yorkeys Knob and other Northern Beaches suburbs (including Trinity Beach, Clifton Beach and Palm Cove) are further north. The suburbs of Kamerunga and Caravonica lie well to the west of the site in the Barron Gorge.

The suburbs comprising the Barron Delta DMPA Study Area are shown on **Figure 12** and described below. The figure also shows suburbs of the Northern Beaches surrounding the study area referenced below.

Figure 12. Northern Beaches suburbs



Machans Beach

Machans Beach is the southernmost of the Northern Beaches, and is located close to and under the flight path of Cairns International Airport. Its location may have affected the amenity of the suburb, despite its coastal location, and it appears to contain some low-cost housing and is not a tourist destination. It hosts few facilities and services, although it does have a school, a few shops and a sports field. It is separated from the highway by flood liable cane fields and served by a bus service.

Council has recently built a new retaining wall along the length of Machans Beach to make it safer and better protected from weather events and erosion. This included foreshore park improvements along O'Shea Esplanade. Prior to the works, Machans Beach seawall was unstable and susceptible to collapse. Reconstruction works began in April 2014, and after 15 months of construction, the foreshore is now comprised of rocks placed to form a stable, flatter rock-face extending about 15 metres out to sea from the original wall. The $16.8 million Machans Beach seawall reconstruction project was officially opened on 15 August 2015[1].

[1]http://www.cairns.qld.gov.au/council/major-projects/completed/machans-beach-seawall-reconstruction#sthash.xRRIPDAs.dpuf.

Holloways Beach

Holloways Beach is the next most southern beachside suburb, and like Machans Beach, is separated from the highway by flood liable cane lands. Its proximity to the airport is shown by an air navigation mast and again planes fly low over Holloways Beach, although at a slightly higher altitude.

Holloways Beach has a greater number of community facilities, including a neighbourhood shopping centre, restaurant, football club, and other community facilities and parks. It has slightly higher residential amenity than Machans Beach, and a limited amount of tourist development in multistorey units. Markets are held at Holloways Beach on one Sunday of the month. Buses serve the suburb. There is a stinger enclosure and lifesavers patrol the beach. It has an adjoining cafe and contains a children's playground and amenities.

Council is currently planning a foreshore improvement program at Holloways Beach, which is on exhibition. According to the Draft Holloways Beach Foreshore Reserve Improvement Plan (CRC, 2017), Holloways Beach has had major issues with erosion and loss of foreshore areas in the past. Several structural and replenishment efforts have been undertaken with rock walls to the south of the main beach area and the use of geofabric groynes near the swimming area.

In 2008 the worst beach erosion was much further north in front of the park (right back into the grassed area). CRC placed over 35,000m^3 of sand dredged from Richters Creek, half of which went in north of Oleander Street. In 2009, further nourishment was undertaken (18,000m^3), with sand trucked down the beach from a dredge at Richters Creek. Some of that sand went on the beach north of Oleander Street. There has been sand replenishment as far up as the Environmental Centre, which lies on the northern tip of the beach.

The Draft Foreshore Improvement Plan reports that erosion at Holloways has moved around and the attention has been focused on the worst affected areas at the time. Council has usually addressed this by sand nourishment with some attention around the stinger net area almost every year.

It is noted by the Draft Foreshore Improvement Plan that for the last 3 years, apart from local erosion in the area of the stinger net, the beach has held its profile fairly well, a big improvement on 2008 and 2009. Using groynes has always been an option and a geofabric groyne trial (sand tubes) was done years ago at the southern end of the park. Further pursuit of geofabric or other groyne style systems is constrained by approvals required from EPA/EHP who appear to be very reluctant to consider these solutions. This has made it problematic for Council to progress any more stable and lasting solutions to sand loss and beach erosion.

According to Council's website[2], the most recent sand nourishment program was undertaken in Holloways Beach between late February and the end of May 2016, a period of three months. This involved dredging sand from the mouth of Richters Creek at the northern end of the beach and pumping it through pipes to the rock wall and stinger net areas at the southern end of the beach. Dredging and pumping was programmed to take approximately 10 weeks to complete.

During this time, partial beach closures and minor disruptions to traffic and car parking areas were required. Council sought the public's patience and cooperation. Minor vegetation removal was also required for machinery access requirements.

Figure 13 shows a Location Plan for the works as well as aerial photographs of the works whilst in progress around June 2016.

[2] http://www.cairns.qld.gov.au/water-waste-roads/works-in-progress/closed/holloways#sthash.D3hSBrmh.dpuf

Figure 13. Recent beach nourishment works undertaken at Holloways Beach

Yorkeys Knob

Yorkeys Knob is the next beachside suburb to the north, and contains significantly more tourist accommodation than either of the previous two beaches. There is current multistorey tourism development occurring along the foreshore. It is similarly accessed through cane lands with isolated farmhouses.

The Cattana Wetlands Environmental Park, a low-key tourist attraction and wetlands recreation area, can be accessed from the road leading into Yorkeys Knob from the Captain Cook Highway. The Cattana Wetlands is around 80 hectares of formerly degraded land which Council has rehabilitated into a nature conservation park. Cattana Wetlands has a volunteer program involved in general maintenance such as weeding, planting and re-vegetation. It also involves schools in environmental programs.

Other activities around Yorkeys Knob include an equestrian centre and quad bike tours, as well as the site of the previously proposed Aquis development. It has limited community facilities, primarily the Yorkeys Knob Boating Club and Marina, a small local shopping centre, school and restaurant. Again it is served by the busline. The amenity of the suburb appears mixed, with some more substantial apartments and dwellings situated on the Knob with views out to sea or over the Delta.

Other surrounding suburbs

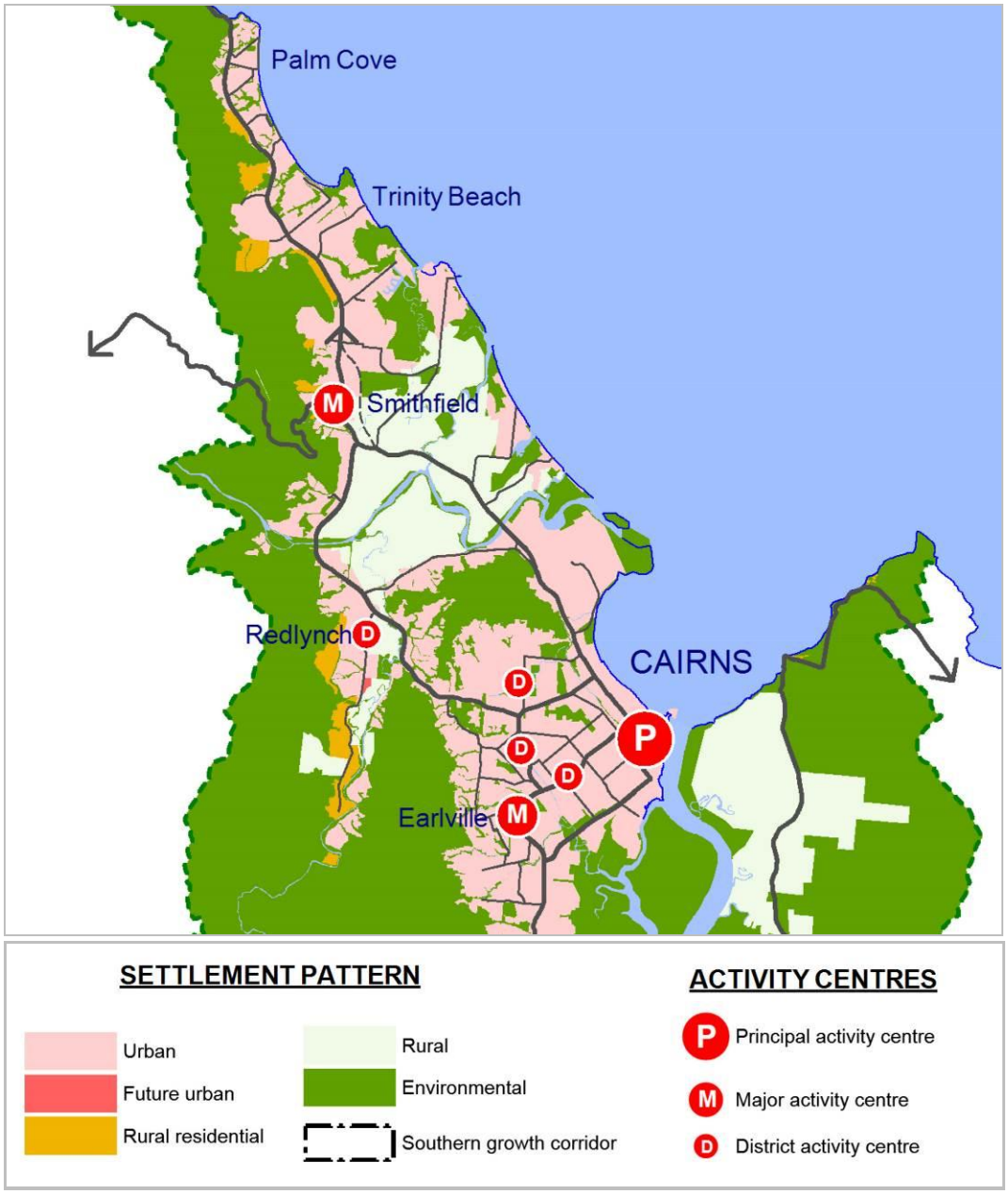
The overall strategic framework for the settlement pattern of the area is shown on **Figure 14**. It is notable that the area containing the site is identified as remaining rural.

The Captain Cook Highway is designated as a major road and public transport route between Cairns and Smithfield and the northern suburbs in Cairns Plan 2014, as is Brinsmead Kamerunga Road, which runs to the west of the site through the suburbs of Kamerunga and Caravonica. These suburbs lie on the western fringe of the identified study area and are more newly developed suburbs, previously used as farmland. Significant urban development did not occur until the 1980s, and the population increased substantially between 1991 and 2006 as new dwellings were built in the two suburbs. Both lie some distance from and upstream of the site.

Mount Whitfield and the associated conservation area is located to the south of the site on a high hill, as are parts of the suburbs of Freshwater and Stratford. These suburbs focus towards Cairns rather than the Delta, and have been identified as lying outside the local study area.

The suburb of Smithfield is located to the northwest and has likewise been determined as lying outside the local study area. Smithfield is designated a major activity centre in Cairns Plan 2016 (see **Figure 14**). Major centres are envisaged to provide a 'concentration of a mix of activities that consist of higher order retail, employment, commercial, administrative, community, cultural, education, higher density housing and entertainment. The start of the Skyrail Rainforest Cableway, a significant tourist attraction, is also located in Smithfield, as is the James Cook University Cairns campus and Smithfield Mall. Smithfield is the major activity centre serving the whole local study area.

Figure 14. Cairns Plan Strategic Framework Settlement Pattern Map



Source: Cairns Plan 2016;

2.2.2.2 Tingira Street DMPA Study Area

The Tingira Street DMPA Study Area as defined on **Figure 8** comprises several sub-areas adjacent to and containing the Tingira Street DMPA. The Tingira Street DMPA is located on reclaimed Ports North land at Portsmith, a largely industrial area to the south of the Cairns CBD. The site is zoned Strategic Port Land under Cairns Plan 2016 and is surrounded by additional Strategic Port land and industrial areas to the north and west, and conservation areas to the west, south and east (on the opposite side of Smiths Creek). Part of Smiths Creek is adjacent to the site on the eastern side and runs around 1km before meeting the larger section of Chinaman Creek/Trinity Inlet which runs adjacent to the Cairns CBD.

Portsmith Industrial Area

As outlined in Section 2.1, the Tingira St DMPA comprises two sites located on designated strategic port land and within the Seaport Local Area of the Port's Land Use Plan (Ports North 2013). The sub-area of the Tingira St DMPA Study Area containing the sites is located within areas designated as Waterfront Industry Planning Area and Industrial Planning Area.

In line with the intent of the Waterfront Industry Planning Area, the immediately surrounding area contains a diverse range of marine related industrial uses including low-impact industrial and port activities such as shipyards, dry dock/ship repair operations, general cargo and the commercial fishing base are located. The continued operation and expansion of these marine orientated industries and activities is encouraged and anticipated, including that of the subject land, which regardless of the project will be filled and utilised for industrial purposes. The Industrial Planning Area is located on the western side of Tingira Street and does not have direct access to the waterfront. It is envisaged that an Industrial Business Park will be developed in this planning area with linkages to the Waterfront Industry Planning Area.

Four community uses are located within the vicinity of the sites:

- a public boat ramp, parking and amenities
- Wooden Boat Association clubhouse and yard
- Great Barrier Reef International Marine College
- Cairns Cruising Yacht Squadron, including a bar, public restaurant, shipyard and marina.

Further, there are already two barge ramps located in Smiths Creek between Cairns Cruising Yacht Squadron and the commercial fishing base. A large barge loading facility is also located in the Duck Pond in Smiths Creek for loading construction materials[3].

There are also various Government agency offices/operations contained in a complex of modern buildings adjoining one site and relatively close to the other site, and adjacent to the public boat ramp:

- Queensland Police Service (QPS) Water Police
- National Parks and Wildlife Service (NPWS) Cairns District Operations Centre
- Wet Tropics Management Authority Yellow Crazy Ant Eradication Office
- Maritime Safety Queensland Operations Base.

Within the wider industrial area there is a vast mixture of uses including concrete pumping, food related industries such as cold stores, food services and warehousing, general and fibreglass fabrication, storage and carriers. Major land uses include the Portsmith Rail Complex and the Portsmith Materials Recovery Facility, the previous Council landfill site. The naval base, HMAS Cairns, is also located in the area.

Wharf Street Area

The area opposite and nearby the Cairns Cruise Liner Terminal in this study has been termed the 'Wharf Street Area'. This area forms part of the Cairns city centre. The city centre is identified as a principal centre in the Strategic Framework of the Cairns Plan 2016 (CRC, 2016). This framework notes that the principal centre should provide the highest intensity of development including the highest order and most diverse mix of uses consisting of retail, commercial, administrative, community, cultural, tourism, recreation and entertainment uses. The Cairns city centre is the centre of the public transport network and is the primary focal point for employment and business opportunities. It supports development which contributes to a 24 hour economy and development contributes to the activity and vitality of the centre, while maintaining a desired standard of amenity.

Residential uses are to be provided above ground level to support active frontages to the street, and should support both tourist accommodation and permanent residents.

[3] http://www.portsnorth.com.au/pdfs/cairns/InformationSheet_CairnsBerthsWharves.pdf

The areas adjacent to the Cruise Liner Terminal are predominantly zoned as Principal Centre Zone (see **Figure 15**). Some pockets of land are zoned for community facilities (mainly government facilities including courthouse and police station at the corner of Sheridan St and Hartley St) and open space in the area adjacent to the wharf.

The Principal centre zone code notes the following relevant overall outcomes for development in the zone:

- widest range of uses provided – retail, commercial, administrative, community, cultural, tourism, recreation and entertainment activities
- accommodation activities are provided at an appropriate scale and integrate with and enhance the vibrancy of the centre
- development provides a high level of amenity with tropical design architectural elements and building features
- landscaping is of a high quality
- development encourages active transport
- development contributes to a vibrant, engaging and active city centre
- development does not affect the operational aspects of the Port of Cairns.

Figure 15. Cairns Plan 2016 zoning map

The area adjacent to the wharf is designated in the Cairns city centre Local Plan as part of the city centre core precinct (see **Figure 16**). The overall outcomes for the city centre core precinct suggest that development should:

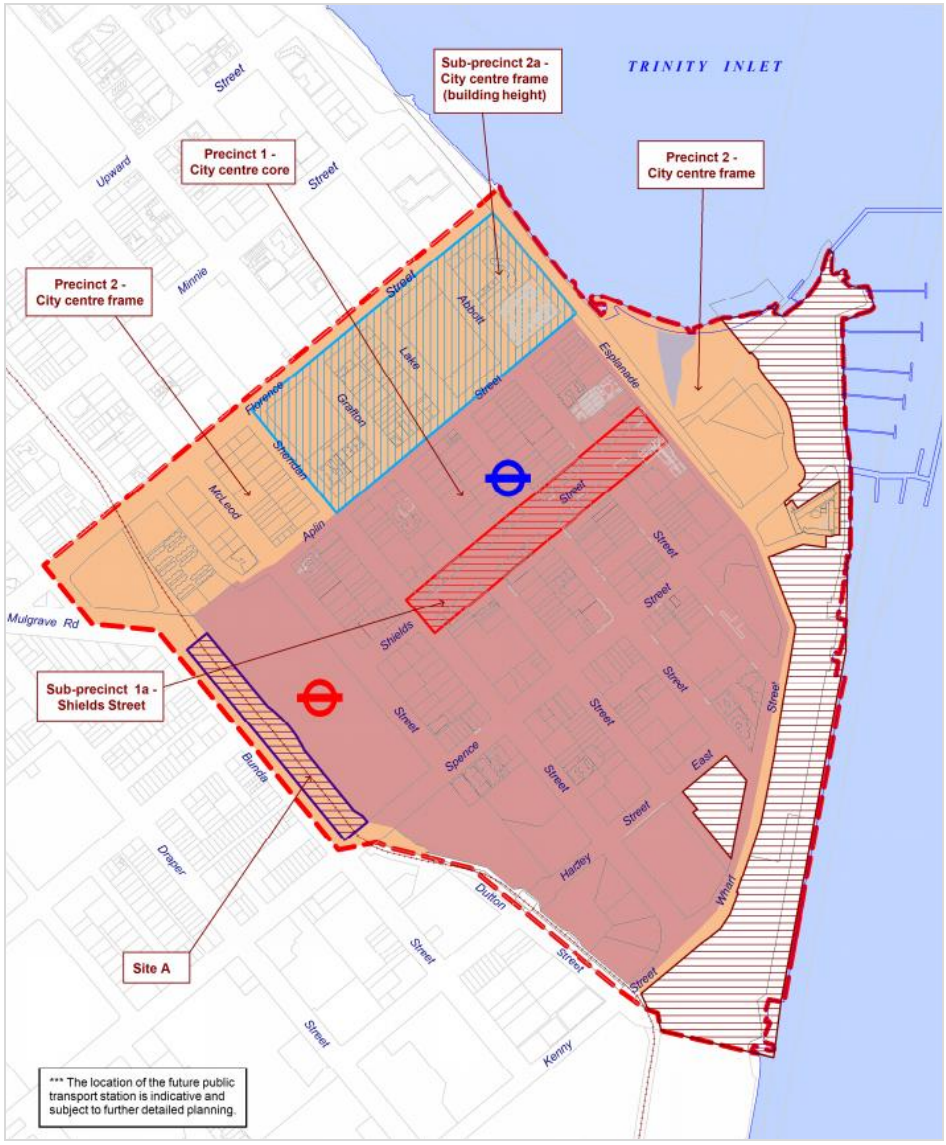
- offer the widest range and diverse mix of the highest order retail, commercial, employment, residential, administrative, community, cultural, recreational and entertainment activities
- have a built form and building height that reinforces the city centre as a principal centre
- support a 24 hour economy
- residential buildings should provide higher density living above ground level to facilitate active frontages at street level.

The Cairns city centre Local Plan Code also includes detailed extrinsic material about the city centre local plan area, including:

- identification of key infrastructure supporting the city centre including Cairns Airport, Port of Cairns, Cairns Base Hospital and Cairns Private Hospital
- the city centre is the dominant centre for office based employment including head offices and government agencies
- it has an active and vibrant night economy support by tourist activity, and further permanent residential development is encouraged to complement tourist activity
- new development has established on the edge of the city centre towards Trinity Inlet. The urban structure needs to be more compact and link this area with the city centre. The city centre master plan identifies Cairns Central, Esplanade and City Port as key nodes in the city centre that require connection and integration
- activity needs to be encouraged in the city centre through diversification of uses and establishment of a 24 hour economy. A lively city centre is encouraged and being an economic hub for the region
- the Port of Cairns including Cairns Cruise Liner Terminal and City Port are noted as strategic port land assessed separately under the Port's land use plan.

As anticipated from the above planning framework, the Wharf Street area is a lively and interesting precinct, with a mixture of tourist, retail, commercial, entertainment and a small amount of residential development. One large scale high-rise tourist/residential development is located directly opposite the Cairns Cruise Liner Terminal, built behind the facade of a heritage building. The terminal itself has now being redeveloped to accord with Cairns tropical design and retain important heritage elements, and is surrounded by an attractive and active landscaped public domain, and a view of this is obtained by residents in the high-rise building.

Figure 16. Cairns Plan 2016 city centre local plan precincts



2.3 Demographic Profile of the Study Areas

2.3.1 EIS Study Area – Cairns LGA

Population

The estimated resident population[4] of the Cairns LGA was estimated to be 161,932 people at 30 June 2016 (this is a preliminary estimate and may be revised). Between 2011 and 2016 the population is estimated to have grown by around 10,940 people, or around 1.4% per year during this five year period. This is a slightly lower growth rate than for Queensland as a whole during this period, with 1.6% per year.

[4] Estimated resident population (ERP) figures are calculated for 30 June by adjusting census counts of usual residents to include those missed in the census and those who were overseas on census night and also take account of births and deaths occurring between 30 June and census night (usually early August). It is the official population count.

Table 1. Population growth, Cairns LGA and Queensland, 2006-2016p

Area	2006	2011	2016p
	Estimate Resident Population (average annual growth rate for preceding period)		
Cairns LGA	131,843 (2.7%)	150,992 (2.7%)	161,932 (1.4%)
Queensland	**4,007,992** (2.3%)	**4,476,778** (2.2%)	**4,843,303** (1.6%)

Source: Queensland Government 2017a;
Notes: p = preliminary estimate.

Around 4,500 visitors were counted in the region on census night in visitor only households.

The population of the Cairns LGA is expected to grow to 227,542 people in total at 2036, an increase of around 64,000 people above the population estimate at 2016. This is an anticipated increase of around 40% during this 20 year period, and an average annual growth rate of around 1.7%.

Table 2. Population projections, Cairns LGA and Queensland, 2011-2036

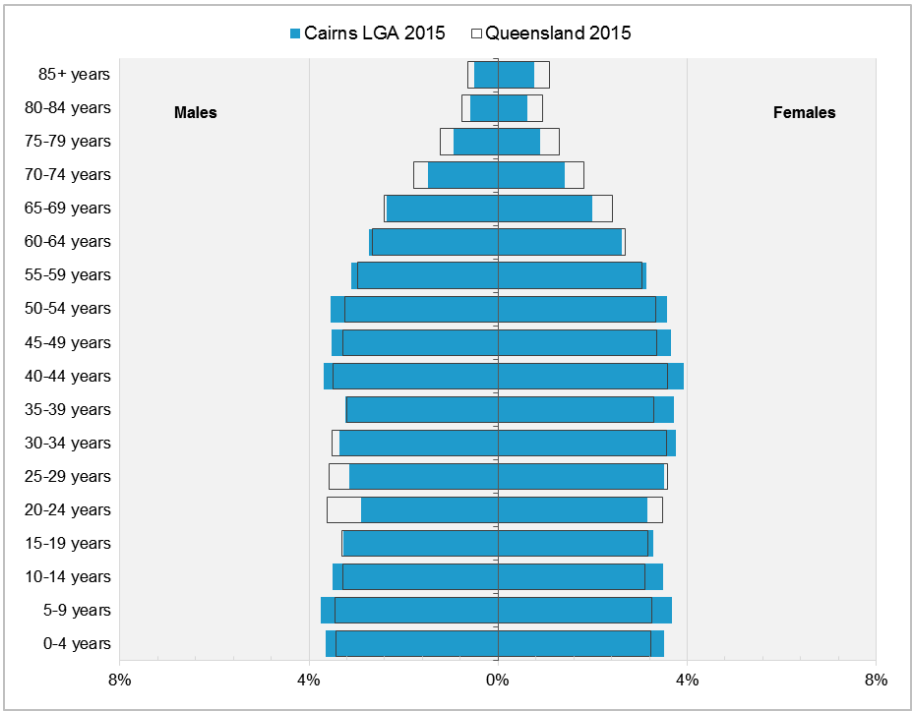
Area	2011	2016	2021	2026	2031	2036
	Population (average annual growth rate for preceding period)					
Cairns LGA	150,992 (2.7%)	163,469 (1.6%)	177,655 (1.7%)	193,970 (1.8%)	210,844 (1.7%)	227,542 (1.5%)
Queensland	**4,476,778** (2.2%)	**4,853,048** (1.6%)	**5,250,292** (1.6%)	**5,730,062** (1.8%)	**6,240,546** (1.7%)	**6,763,153** (1.6%)

Source: Queensland Government 2017a;
Notes: Queensland Government Population Projections: 2015 Edition (Medium Series).

Age Structure

The median age of the population was estimated to be 36.5 years in 2015, which was just slightly younger than the median age for the population of Queensland at that time of 36.9 years.

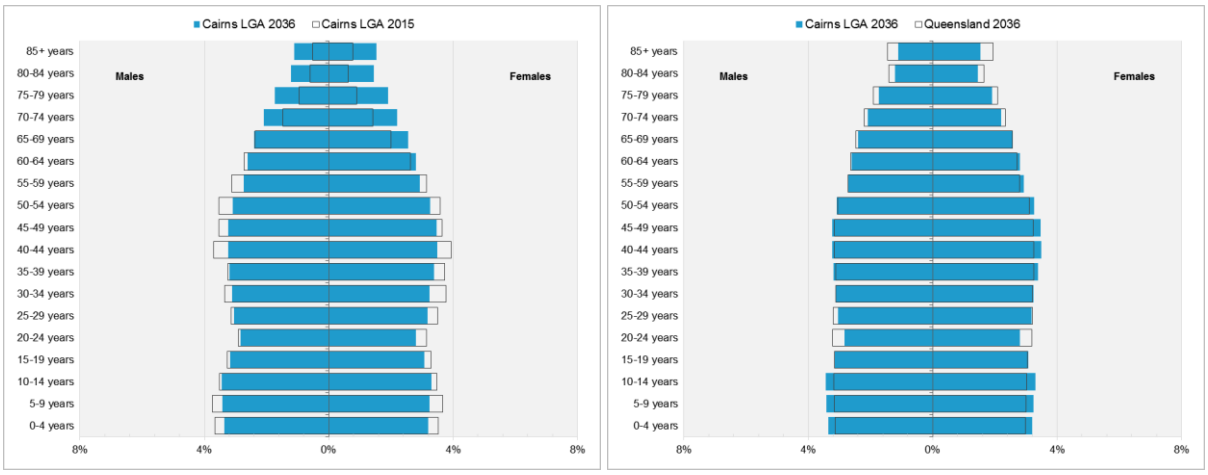
Figure 17. Age profile, Cairns LGA and Queensland, 2015p



Source: Queensland Government 2016d;
Notes: p = preliminary estimate.

Compared to 2015, the age profile of the Cairns LGA is projected to include higher proportions of older people (65 years of age and older), and lower proportions of other age groups (see **Figure 18**). This ageing of the population means that at 2036, around 18% of residents could be 65 years of age and older compared to around 12% in 2015. This is in line with national trends of an ageing population.

Figure 18. Future age profile, Cairns LGA and Queensland, 2015p and 2036



Source: Queensland Government 2016e;
Notes: p = preliminary estimate.

Household and Family Structure

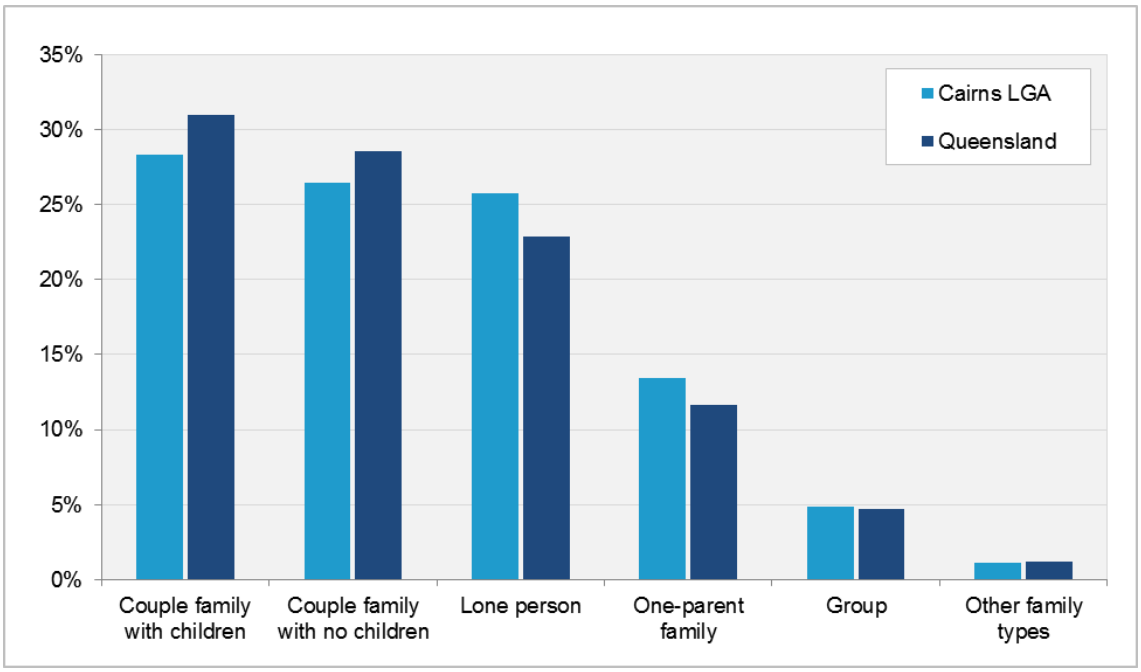
Cairns LGA had a similar household structure to Queensland, with slightly higher proportions of lone person households and one parent households, and slightly lower proportions of couples and couples with children households (see **Table 3** and **Figure 19**). The most common household type in both Cairns LGA and Queensland was couple families with children.

Table 3. Household type, Cairns LGA and Queensland, 2011

Area	Couple family with no children	Couple family with children	One-parent family	Other family type	Group	Lone person	Total
Cairns LGA	14,023 (26.4%)	15,044 (28.4%)	7,141 (13.5%)	574 (1.1%)	2,573 (4.9%)	13,674 (25.8%)	**53,030** (100%)
Queensland	442,309 (28.6%)	479,499 (31.0%)	180,151 (11.6%)	18,870 (1.2%)	72,966 (4.7%)	353,510 (22.8%)	**1,547,304** (100%)

Source: Queensland Government 2017a;
Note: Data for families and households have been combined here by assuming that secondary families in the small number of multi-family households (748 of 53,030 households) for the Cairns LGA have the same family type as the primary family.

Figure 19. Household type, Cairns LGA and Queensland, 2011



Source: Queensland Government 2017a;
Note: Data for families and households have been combined here by assuming that secondary families in the small number of multi-family households (748 of 53,030 households) have the same family type as the primary family.

Cultural diversity

There were 13,438 people in the Cairns LGA who identified as Aboriginal and/or Torres Strait Islander in 2011, representing 9.2% of the total resident population counted on census night[5]. This included 6,997 people who identified as Aboriginal, 4,176 people who identified as Torres Strait Islander and 2,264 people who identified as being of both Aboriginal and Torres Strait Islander origin. This compares to 3.6% of the Queensland population who identified as Aboriginal and/or Torres Strait Islander people.

[5] The resident population counted on census night is referred to as the population based on place of usual residence (PUR Population). It is the count of the population on census night according to where the person usually lives.

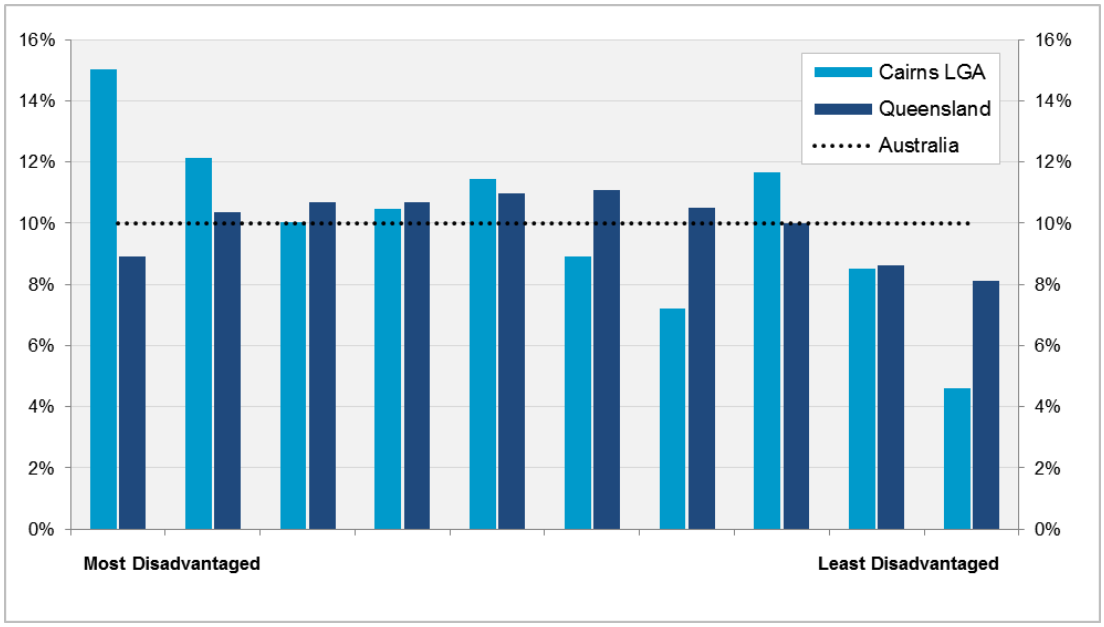
Around 20% of the population in 2011 was born overseas, including around 13,900 people or 9.6% of the population born in mainly English speaking countries[6], and 15,600 people or 10.7% of the population born in mainly non-English speaking countries. These were similar proportions compared to Queensland, with 11.0% of the population born in mainly English speaking countries and 9.5% born in mainly non-English speaking countries, a total of 20.5% of the population born overseas.

Socio-economic characteristics

The Socio-Economic Indexes for Areas (SEIFA Index) is a product developed by the ABS that ranks areas in Australia according to relative socio-economic advantage and disadvantage by using various Census-based statistics (i.e. income, skills, unemployment, educational attainment, etc.). In this report the SEIFA measure used is the index of relative socio-economic disadvantage at the SA1 level for the whole of Australia. For this measure each neighbourhood in Australia has been ranked from most disadvantaged to least disadvantaged, and then these neighbourhoods are grouped into deciles based on population. Each decile group in Australia therefore includes neighbourhoods that each consist of 10% of the population of Australia. However, disadvantage is not equally distributed geographically across Australia, and some areas therefore have higher/lower proportions of their population in each decile group. The index of relative socio-economic disadvantage is most concerned with disadvantage, rather than for distinguishing groups that are the least disadvantaged, and therefore the analysis here concentrates on the proportion of the population in the most disadvantaged deciles.

Figure 20 shows the proportion of the Cairns LGA in each decile of disadvantage, from most disadvantaged to least disadvantaged. If the Cairns LGA was reflective of the disadvantage in Australia, it would have 10% of its population in each decile group. However, around 15% of the population have characteristics that place them in the most disadvantaged group and around 12% in the second most disadvantaged group. This suggests that a higher proportion of the Cairns LGA population is severely disadvantage compared to Australia. This is also true when compared to Queensland.

Figure 20. SEIFA Relative Disadvantage, Population distribution, Cairns LGA, Queensland and Australia, 2011



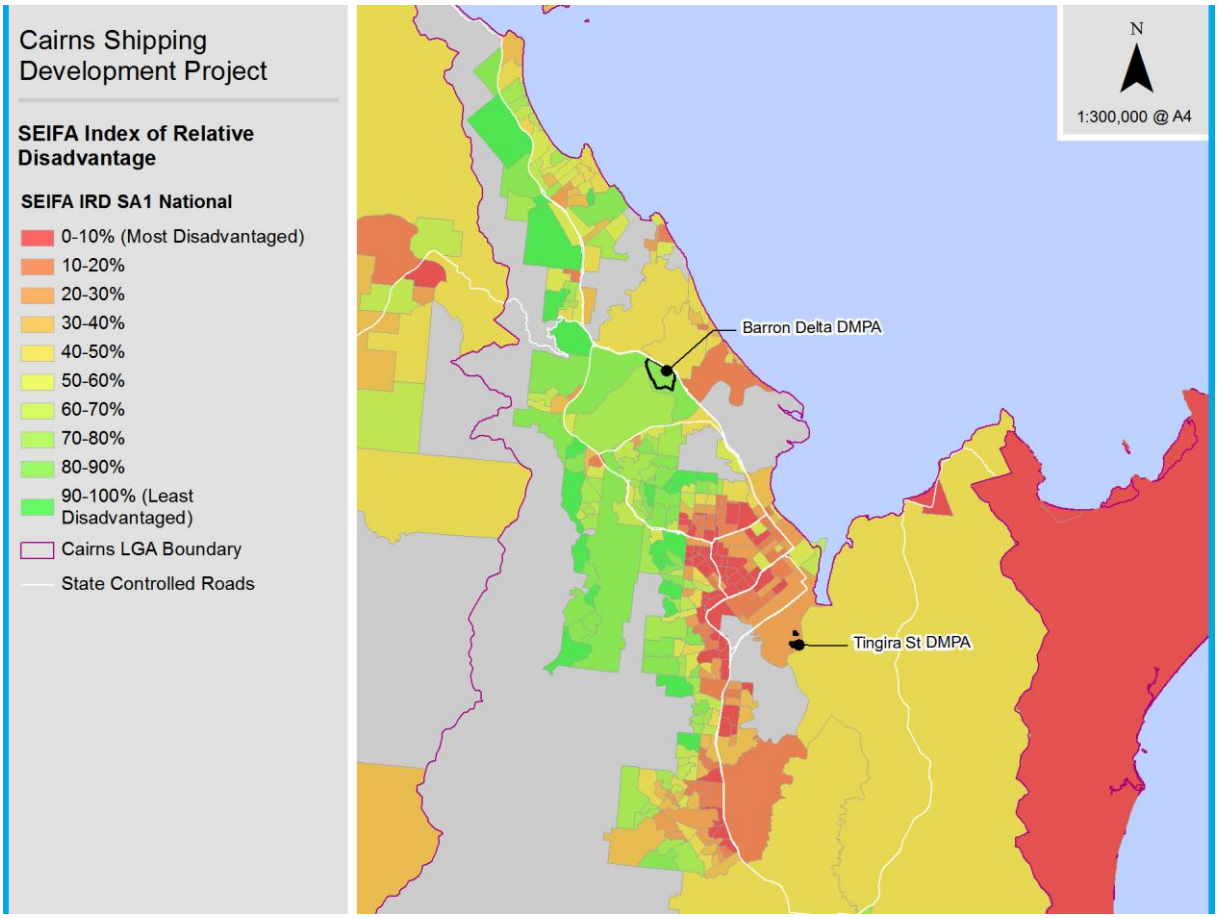
Source: ABS 2013b;

Socio-economic disadvantage in the region is clustered around the inner western suburbs of Cairns and extends to the south along the Bruce Highway toward the suburb of Edmonton, according to the SEIFA index (ABS 2013b).

[6] Mainly English speaking countries are the United Kingdom, Ireland, Canada, the United States of America, South Africa and New Zealand.

Parts of the western suburbs including Manunda, Manoora and Westcourt, and southern suburbs including Woree, White Rock, Bentley Park and Edmonton generally have higher levels of socio-economic disadvantage. **Figure 21** below shows the index of relative socio-economic disadvantage (IRSD) for statistical areas in the region.

Figure 21. SEIFA Relative Disadvantage, SA1 (Australia), Cairns City, 2011



Source: ABS 2013b;

Income

The median weekly individual income was $624, median weekly family income was $1,407 and median weekly household income was $1,160 for the Cairns LGA in 2011 (see **Table 4**). These median incomes were similar to the median incomes for Queensland.

Table 4. Income measures, Cairns LGA and Queensland, 2011

Area	Median Weekly Income (2011)		
	Individual	Family	Household
Cairns LGA	$624	$1,407	$1,160
Queensland	**$587**	**$1,453**	**$1,235**

Source: Queensland Government 2017a;

Employment and Unemployment

The unemployment rate for Cairns LGA was 6.6% in 2011, which was slightly higher than for Queensland at 6.1%. The participation rate for Cairns LGA was comparable to Queensland in 2011 (65% for Cairns LGA, compared to 63% for Queensland).

More recent data shows that the Cairns LGA unemployment rate was around 1% point higher than for Queensland in the December Quarter of 2016 (see **Table 5**).

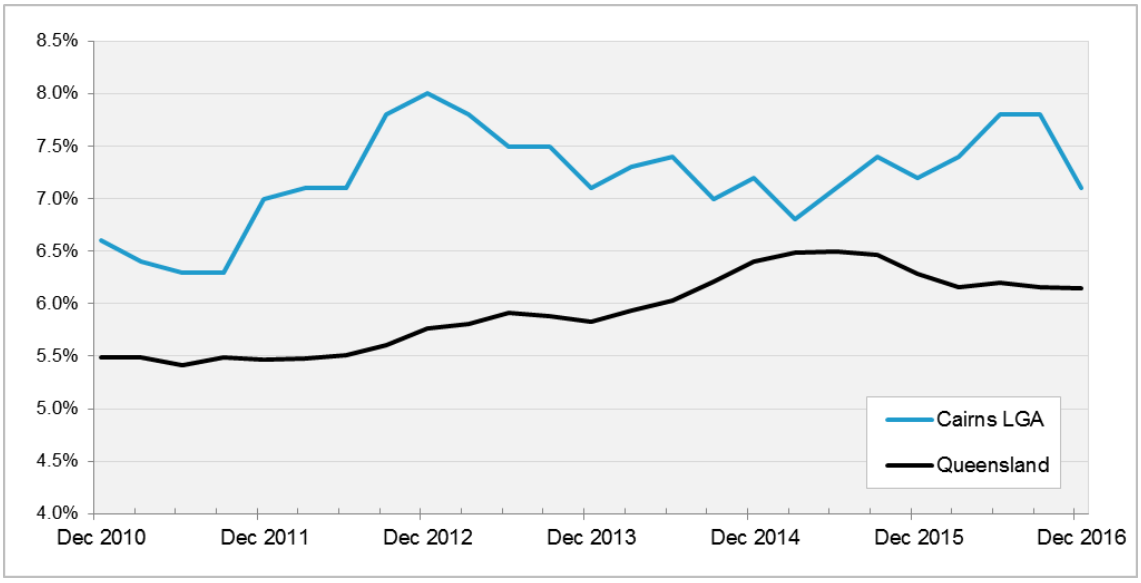
Table 5. Employment measures, Cairns LGA and Queensland, December 2016

Area	Employed / Unemployment Rate (Dec Quarter 2016) (a)
	Number and Rate
Cairns LGA	5,773 (7.1%)
Queensland	**154,184 (6.1%)**

Source: Queensland Government 2017a;
Notes: (a) Unemployed and unemployment rate smoothed using four-quarter average.

The Cairns LGA unemployment rate has been higher than the Queensland rate from 2011 to 2016 (see **Figure 22**). In recent times, while the Queensland unemployment rate increased in 2015 to around 6.5%, it decreased in 2016 to just over 6.0%. The Cairns LGA unemployment rate increased in 2016 to be around 7.5% on average.

Figure 22. Unemployment rate (smoothed), Cairns LGA and Queensland, Dec 2010-Dec 2016



Source: Australian Government (Department of Employment) 2017;
Unemployment rate smoothed using four-quarter average.

In 2011, over 50% of the working population residing in Cairns LGA were employed in the top five employment industries: health care and social assistance (12.8%), retail trade (11.9%), accommodation and food services (9.6%), construction (8.8%) and public administration and safety (8.3%) (see **Table 6**). Compared to Queensland, Cairns LGA had higher proportions of residents working in accommodation and food services; arts and recreation services; transport, postal and warehousing; and public administration and safety. These industries are highlighted in the rows in **Table 6**.

Table 6. Industry of Employment, Cairns LGA and Queensland, 2011

Industry	Cairns LGA		Queensland		Special-isation ratio (b)
Health care and social assistance	8,855	12.8%	242,559	11.9%	1.07
Retail trade	8,216	11.9%	217,610	10.7%	1.11
Accommodation and food services	6,651	9.6%	141,855	7.0%	1.38
Construction	6,112	8.8%	183,780	9.0%	0.98
Public administration and safety	5,779	8.3%	136,818	6.7%	1.24
Education and training	5,534	8.0%	160,921	7.9%	1.01
Transport, postal and warehousing	4,624	6.7%	107,072	5.3%	1.27
Manufacturing	3,534	5.1%	171,669	8.4%	0.61
Professional, scientific and technical services	3,459	5.0%	132,754	6.5%	0.77
Other services	2,839	4.1%	78,713	3.9%	1.06
Administrative and support services	2,541	3.7%	65,015	3.2%	1.15
Wholesale trade	2,216	3.2%	74,288	3.6%	0.88
Rental, hiring and real estate services	1,360	2.0%	37,007	1.8%	1.08
Arts and recreation services	1,267	1.8%	28,444	1.4%	1.31
Financial and insurance services	1,203	1.7%	54,153	2.7%	0.65
Mining	997	1.4%	52,955	2.6%	0.55
Agriculture, forestry and fishing	931	1.3%	55,416	2.7%	0.49
Electricity, gas, water and waste services	777	1.1%	24,828	1.2%	0.92
Information media and telecommunications	642	0.9%	25,358	1.2%	0.75
Total (a)	**69,253**	**100.0%**	**2,039,275**	**100.0%**	**1.00**

Source: Queensland Government 2017a;
Notes: (a) Includes inadequately described and not stated responses.
(b) Specialisation ratio = Cairns LGA proportion / Queensland proportion. Therefore, values above 1 note where the industry employs a higher proportion of the local population than for Queensland, and values below 1 note where the industry employs a lower proportion of the local population than for Queensland. It therefore implies some local specialisation in that industry compared to the State.
Based on place of usual residence (not place of work). Light blue highlighting represents industries employing higher proportions of residents in Cairns LGA compared to Queensland.

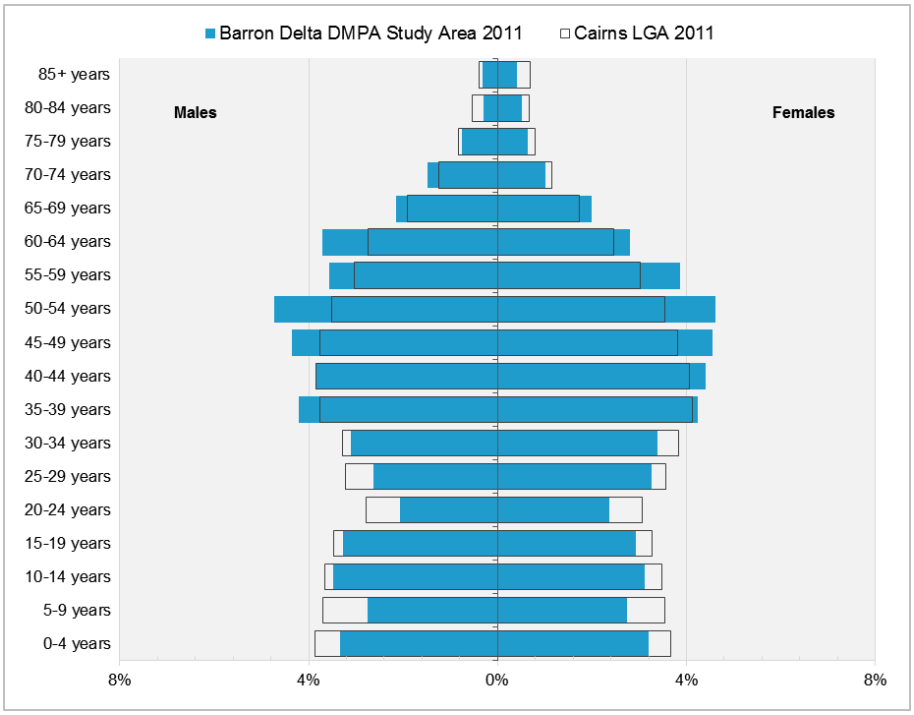
2.3.2 Barron Delta (Northern Sands) DMPA Study Area

Population, age and household characteristics

The Barron Delta DMPA Study Area had a resident population of 8,850 people at the time of the census in 2011 (based on place of usual residence), representing around 6.1% of the total population of the Cairns LGA.

The median age of the Barron Delta DMPA Study Area was 39.0 years of age in 2011. This was 2-3 years older than the median age for Cairns LGA and for Queensland, both around 36 years in 2011. The age profile of the Barron Delta DMPA Study Area is shown below in **Figure 23**. It suggests that the area had larger proportions of older working age people from around 35 to 64 years of age, lower proportions of children and young adults, and slightly lower proportions of older people.

Figure 23. Age profile, Barron Delta DMPA Study Area and Cairns LGA, 2011



Source: ABS 2013a;

There were 1,062 lone person households in the Barron Delta DMPA Study Area in 2011, representing 29.3% of total households (see **Table 7**). This was the most common household type in the study area, followed by couple families without children (27.9%), couple families with children (22.8%) and one parent families (13.4%). Compared to Cairns LGA and Queensland, the study area had a high proportion of lone person households (29.3%, compared to 25.8% for Cairns LGA and 22.8% for Queensland).

Table 7. Household type, Barron Delta DMPA Study Area, Cairns LGA and Queensland, 2011

Area	Couple family with no children	Couple family with children	One-parent family	Other family type	Group	Lone person	Total
Barron Delta DMPA Study Area	1,009 (27.9%)	824 (22.8%)	486 (13.4%)	40 (1.1%)	199 (5.5%)	1,062 (29.3%)	3,621 (100%)
Cairns LGA	14,023 (26.4%)	15,044 (28.4%)	7,141 (13.5%)	574 (1.1%)	2,573 (4.9%)	13,674 (25.8%)	**53,030** (100%)
Queensland	442,309 (28.6%)	479,499 (31.0%)	180,151 (11.6%)	18,870 (1.2%)	72,966 (4.7%)	353,510 (22.8%)	**1,547,304** (100%)

Source: ABS 2011; Queensland Government 2017a;
Note: Data for families and households have been combined here by assuming that secondary families in the small number of multi-family households (748 of 53,030 households) for the Cairns LGA have the same family type as the primary family.

Cultural diversity

There were 547 people who identified as Aboriginal and/or Torres Strait Islander people in the Barron Delta DMPA Study Area in 2011, representing 6.2% of the population. This compared to 9.2% for the Cairns LGA, and 3.6% for Queensland.

Around 1,927 people in the Barron Delta DMPA Study Area were born overseas, representing 21.8% of the population. This was a slightly higher proportion of people born overseas than for the Cairn LGA at 20.3%, and Queensland at 20.5%. Of the population born overseas, 1,473 people were born in mainly English speaking countries (76%), and 454 people were born in mainly non-English speaking countries (24%) in the Barron Delta DMPA Study Area. This was a high proportion of migrants from mainly English speaking countries, compared to Cairns LGA and Queensland (76% of migrants in the Barron Delta DMPA Study Area were from English speaking countries, compared to 47% for the Cairns LGA and 70% for Queensland).

Only a small proportion of the population had migrated to Australia during the preceding five year period (2.9%), a lower proportion when compared to Cairns LGA (4.0%) and Queensland (4.5%).

Socio-economic characteristics

The median weekly individual income for residents of the Barron Delta DMPA Study Area was $652, median family income was $1,400 and median household income was $1,124 in 2011 (see **Table 8**). These medians were very similar to the medians for the Cairns LGA at $624, $1,407 and $1,160 per week respectively.

There were 342 unemployed people in the Barron Delta DMPA Study Area at the time of the census in 2011, which represented an unemployment rate of 8.0%. This was a high unemployment rate compared to the Cairns LGA at 6.7% and for Queensland at 6.1% at this time.

Table 8. Income and employment rate, Barron Delta DMPA Study Area, 2011

Population	Median Weekly Income (2011)			Unemployed (2011)
	Individual	Family	Household	
Barron Delta DMPA Study Area	$652 (a)	$1,400 (a)	$1,124 (a)	342 (8.0%)
Cairns LGA	$624	$1,407	$1,160	4,983 (6.7%)
Cairns Douglas LGA	$620	$1,393	$1,145	5,264 (6.6%)
Queensland	$587	$1,453	$1,235	131,797 (6.1%)

Source: ABS 2011; ABS 2013a; Queensland Government 2017a;
Notes: (a) Estimated for combined area.

In 2011, 14.3% of employed residents of the Barron Delta DMPA Study Area were employed in the health care and social assistance industry, 10.4% were employed in retail trade, 10.1% in construction and 9.9% in accommodation and food services (see **Table 9**). Compared to the Cairns LGA, the study area had higher proportions of residents employed in health care and social assistance; construction; accommodation and food services; education and training; transport, postal and warehousing; administrative and support services; and mining. Surprisingly, a lower proportion than Cairns LGA and Queensland were employed in agriculture, forestry and fishing (0.7% compared with 1.3% and 2.7% respectively.

Table 9. Industry of Employment, Barron Delta DMPA Study Area, Cairns LGA and Queensland, 2011

Industry	Barron Delta DMPA Study Area		Cairns LGA		Queensland	
Health care and social assistance	657	14.3%	8,855	12.8%	242,559	11.9%
Retail trade	479	10.4%	8,216	11.9%	217,610	10.7%
Construction	464	10.1%	6,112	8.8%	183,780	9.0%
Accommodation and food services	455	9.9%	6,651	9.6%	141,855	7.0%
Education and training	399	8.7%	5,534	8.0%	160,921	7.9%
Public administration and safety	380	8.3%	5,779	8.3%	136,818	6.7%

Industry	Barron Delta DMPA Study Area		Cairns LGA		Queensland	
Transport, postal and warehousing	336	7.3%	4,624	6.7%	107,072	5.3%
Professional, scientific and technical services	248	5.4%	3,459	5.0%	132,754	6.5%
Manufacturing	223	4.9%	3,534	5.1%	171,669	8.4%
Administrative and support services	173	3.8%	2,541	3.7%	65,015	3.2%
Other services	151	3.3%	2,839	4.1%	78,713	3.9%
Wholesale trade	93	2.0%	2,216	3.2%	74,288	3.6%
Arts and recreation services	79	1.7%	1,267	1.8%	28,444	1.4%
Mining	77	1.7%	997	1.4%	52,955	2.6%
Rental, hiring and real estate services	79	1.7%	1,360	2.0%	37,007	1.8%
Financial and insurance services	52	1.1%	1,203	1.7%	54,153	2.7%
Information media and telecommunications	52	1.1%	642	0.9%	25,358	1.2%
Electricity, gas, water and waste services	46	1.0%	777	1.1%	24,828	1.2%
Agriculture, forestry and fishing	31	0.7%	931	1.3%	55,416	2.7%
Total (a)	**4,595**	**100.0%**	**69,253**	**100.0%**	**2,039,275**	**100.0%**

Source: ABS 2011; Queensland Government 2017a;
Notes: (a) Includes inadequately described and not stated responses.
Based on place of usual residence (not place of work). Light blue highlighting represents industries employing higher proportions of residents in the Barron Delta DMPA Study Area compared to the Cairns LGA.

2.3.3 Barron Delta DMPA Area – Sub Areas

Population, age and household characteristics

The resident population of each of the five sub-areas within the Barron Delta DMPA Study Area is listed in **Table 10** below for 2011. Yorkeys Knob had the highest population in 2011 of any of the sub-areas, with a population of 2,766 people, followed by Holloways Beach at 2,283 people, and Caravonica at 1,934 people. Machans Beach and Kamerunga had around 950 people each.

The median ages of the sub-areas were fairly similar and were all higher than the Cairns LGA and Queensland medians in 2011. Machans Beach had the highest median age at 42 years followed by Holloways Beach at 41 years. Caravonica and Kamerunga had the lowest median ages of the sub-areas at 38 years.

Table 10. Population and median age, Barron Delta DMPA Study Sub-Areas, 2011

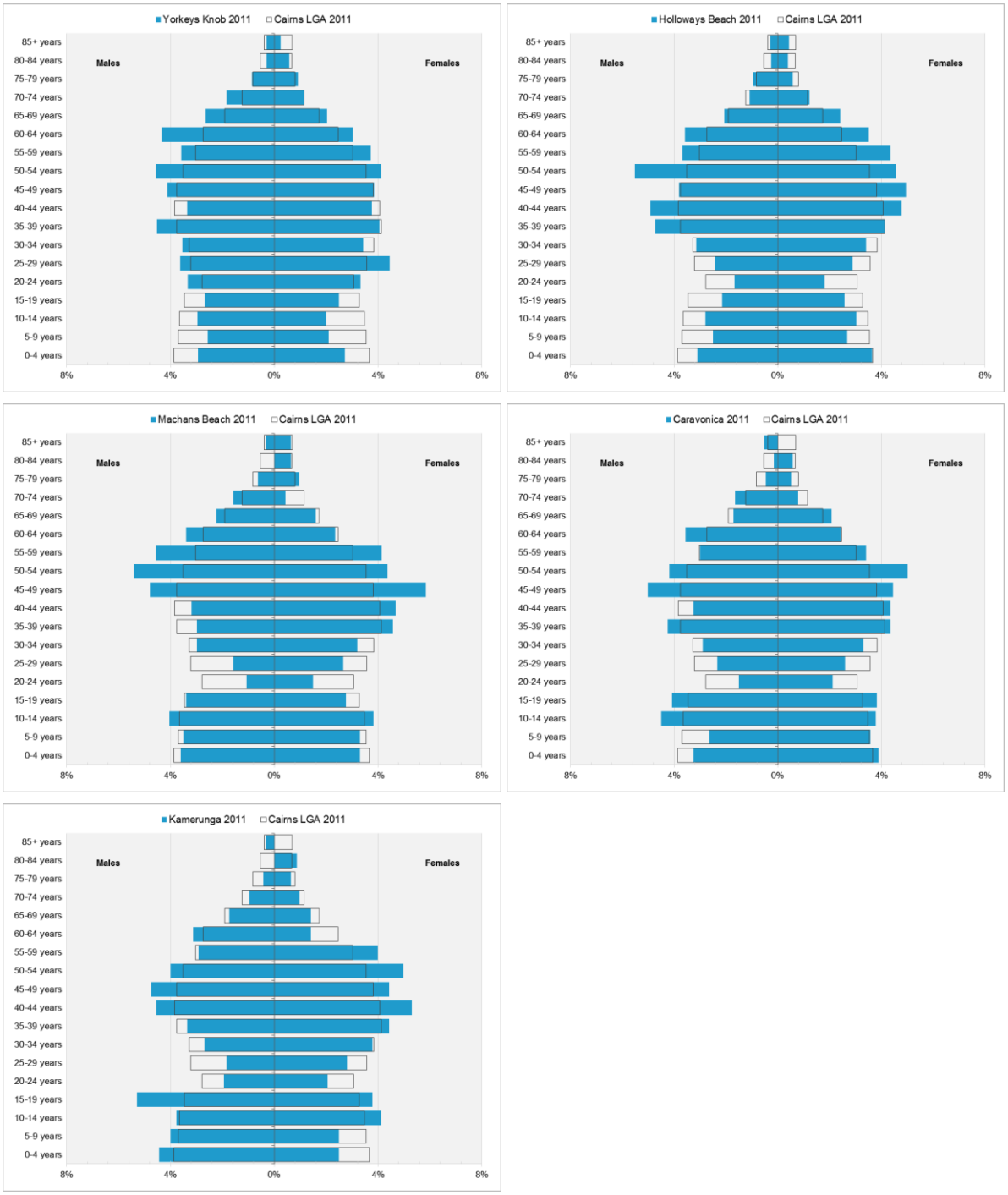
Area	Population (Usual Place of Residence)	Median Age
Yorkeys Knob	2,766	39.0
Holloways Beach	2,283	41.0
Machans Beach	941	42.0
Caravonica	1,934	38.0
Kamerunga	926	38.0
Barron Delta DMPA Study Area	8,850	39.0
Cairns LGA	145,338	36.0
Cairns Douglas LGA	156,169	36.0
Queensland	4,332,739	36.0

Source: ABS 2011; ABS 2013a;

Age profiles for each of the five sub-areas are included in **Figure 24** below. A number of observations can be made about the age profiles of these sub-areas at 2011:

- Yorkeys Knob had lower proportions of children (0-19 years of age) compared to Cairns LGA, and higher proportions of older adults (50-64 years);
- Holloways Beach also had lower proportions of children, but also lower proportions of young adults as well (0-34 years of age). Holloways Beach had higher proportions of age groups from 35 to around 64 years of age.
- Machans Beach had only slightly lower proportions of children compared to Cairns LGA in 2011, but significantly lower proportions of young adults (20-34 years of age). The suburb has higher proportions of older age groups from around 45 to 64 years of age.
- Caravonica also had lower proportions of young adults (around 20-34 years of age), as well as lower proportions of younger children (0-9 years) but higher proportions of older children (10-19 years), as well as higher proportions of older people in the 45 to 54 year age groups.
- Kamerunga was somewhat similar to Caravonica with lower proportions of younger children (0-9 years), higher proportions of older children (10-19 years), lower proportions of young adults (20-34 years), and higher proportions of older adults (40-59 years).

Figure 24. Age profile, Barron Delta DMPA Study Sub-Areas, 2011



Source: ABS 2011; ABS 2013a;

Household profiles for each of the five sub-areas are included in **Table 11** below. These profiles show:

- Yorkeys Knob had a high proportion of lone person households (37.7%) compared to the other sub-areas, and Cairns LGA (25.8%) and Queensland (22.8%). It had smaller proportions of couple families with children (16.2%), compared to the other sub-areas, Cairns LGA (28.4%) and Queensland (31.0%).
- Holloways Beach also had a higher proportion of lone person households (32.7%) compared to Cairns LGA (25.8%) and Queensland (22.8%), and a lower proportion of couple families with children (18.5%), compared to Cairns LGA (28.4%) and Queensland (31.0%).

- Machans Beach had a higher proportion of one parent families (18.2%) compared to the other sub-areas, Cairns LGA (13.5%) and Queensland (11.6%). The sub-area also had a lower proportion of couple families with children (22.0%) than Cairns LGA (28.4%) and Queensland (31.0%).
- Caravonica had a higher proportion of couple families with children, and a lower proportion of lone person households. Couple families with children made up 34.5% of households, compared to 28.4% for Cairns LGA and 31.0% for Queensland. Lone person households made up 18.7% of households, compared to 25.8% for Cairns LGA and 22.8% for Queensland.
- Kamerunga also had a higher proportion of couple families with children (36.0%) compared to the other sub-areas, Cairns LGA (28.4%) and Queensland (31.0%), and a lower proportion of lone person households (17.1% compared to 25.8% for Cairns LGA and 22.8% for Queensland).

In summary, lone person households were more common in the beachside sub-areas and couple families with children were more common in the sub-areas away from the coast. The proportions of couple families without children were similar across the sub-areas, as were the proportions of group households and 'other family type' households. One parent families were also fairly similar across the sub-areas, except for at Machans Beach which had a higher proportion of this household type.

Table 11. Household type, Barron Delta DMPA Study Sub-Areas, Cairns LGA and Queensland, 2011

Area	Couple family with no children	Couple family with children	One-parent family	Other family type	Group	Lone person	Total
Yorkeys Knob	336 (26.9%)	203 (16.2%)	153 (12.3%)	15 (1.2%)	72 (5.8%)	472 (37.7%)	1,251 (100.0%)
Holloways Beach	275 (28.2%)	181 (18.5%)	130 (13.3%)	14 (1.4%)	57 (5.8%)	319 (32.7%)	976 (100.0%)
Machans Beach	106 (29.8%)	78 (22.0%)	65 (18.2%)	3 (0.8%)	22 (6.2%)	82 (23.0%)	356 (100.0%)
Caravonica	204 (28.3%)	249 (34.5%)	98 (13.6%)	5 (0.7%)	31 (4.3%)	135 (18.7%)	723 (100.0%)
Kamerunga	87 (27.7%)	113 (36.0%)	40 (12.6%)	4 (1.2%)	17 (5.4%)	54 (17.1%)	315 (100.0%)
Barron Delta DMPA Study Area	1,009 (27.9%)	824 (22.8%)	486 (13.4%)	40 (1.1%)	199 (5.5%)	1,062 (29.3%)	3,621 (100.0%)
Cairns LGA	14,023 (26.4%)	15,044 (28.4%)	7,141 (13.5%)	574 (1.1%)	2,573 (4.9%)	13,674 (25.8%)	**53,030** (100%)
Queensland	442,309 (28.6%)	479,499 (31.0%)	180,151 (11.6%)	18,870 (1.2%)	72,966 (4.7%)	353,510 (22.8%)	**1,547,304** (100%)

Source: ABS 2011; Queensland Government 2017a;
Note: Data for families and households have been combined here by assuming that secondary families in the small number of multi-family households (748 of 53,030 households) for the Cairns LGA have the same family type as the primary family.

Of the 941 residents of Machans Beach, around 45 people or 4.7% of the population, needed assistance in their daily lives with self-care, body movements or communication, which was a slightly higher proportion than for the other sub-areas, Cairns LGA at 3.8% and Queensland at 4.4%.

Cultural diversity

Machans Beach had a slightly higher proportion of people who identified as being of Aboriginal and/or Torres Strait Islander origin (10.1%) compared to the Cairns LGA (9.2%) (see **Table 12**), however this included just 95 people. The other sub-areas had lower proportions of Aboriginal and Torres Strait Islander people. Caravonica had the lowest proportion of the sub-areas at 4.3% (83 people). Yorkeys Knob had the highest number of Aboriginal and Torres Strait Islander people of any of the sub-areas at 188 people.

Caravonica had a higher proportion of residents born overseas at 23.1%, compared to the other sub-areas, Cairns LGA at 20.3%, and Queensland at 20.5%. Caravonica also had a high proportion of residents born overseas in mainly non-English speaking countries compared to the other sub-areas, however this proportion was only slightly higher than for Cairns LGA (6.4%) and Queensland (6.1%).

All of the sub-areas had higher proportions of residents born overseas than the Cairns LGA proportion except for Machans Beach (18.8%, compared to 20.3% for Cairns LGA); and all of the sub-areas had low proportions of new migrants, with under 4% of the populations of each sub-area having migrated to Australia within the preceding five year period.

Table 12. Aboriginal and Torres Strait Islander People, People born overseas, and new migrants, Barron Delta DMPA Study Sub-Areas, 2011

Area	Aboriginal and Torres Strait Islander	Born Overseas (English Speaking)	Born Overseas (Non-English Speaking)	Born Overseas, Migrated to Australia in last 5 years
Yorkeys Knob	188 (6.8%)	466 (16.8%)	127 (4.6%)	98 (3.5%)
Holloways Beach	121 (5.3%)	405 (17.7%)	107 (4.7%)	54 (2.4%)
Machans Beach	95 (10.1%)	132 (14.0%)	45 (4.8%)	25 (2.7%)
Caravonica	83 (4.3%)	318 (16.4%)	128 (6.6%)	47 (2.4%)
Kamerunga	60 (6.5%)	152 (16.4%)	47 (5.1%)	30 (3.2%)
Barron Delta DMPA Study Area	547 (6.2%)	1,473 (16.6%)	454 (5.1%)	254 (2.9%)

Source: ABS 2011; ABS 2013a; Queensland Government 2017a;

Socio-economic characteristics

Kamerunga had higher median weekly incomes than the other sub-areas, and a lower unemployment rate at 2011 (see **Table 13**). The median individual income in Kamerunga was $750, the median family income was $1,692, and the median household income was $1,542. The unemployment rate was 5.4% in 2011. The sub-areas with the lowest median incomes and highest unemployment rates were Yorkeys Knob and Machans Beach. Holloways Beach also had a fairly low median household income and median individual income but a higher median family income.

Table 13. Income and employment rate, Barron Delta DMPA Study Sub-Areas, 2011

Population	Median Weekly Income (2011)			Unemployed (2011)
	Individual	Family	Household	
Yorkeys Knob	$620	$1,279	$938	124 (8.0%)
Holloways Beach	$656	$1,370	$988	82 (6.6%)
Machans Beach	$622	$1,255	$1,167	46 (9.3%)
Caravonica	$662	$1,537	$1,328	61 (5.6%)
Kamerunga	$750	$1,692	$1,542	29 (5.4%)
Barron Delta DMPA Study Area	$652 (a)	$1,400 (a)	$1,124 (a)	342 (8.0%)

Source: ABS 2011; ABS 2013a; Queensland Government 2017a;
Notes: (a) Estimated for combined area.

Around 8.5% of the households of Yorkeys Knob did not have access to a motor vehicle in 2011, which was a high proportion compared to the other sub-areas (Holloways Beach 5.3%, Machans Beach 4.2%, Caravonica 2.5% and Kamerunga 1.6%). This proportion however was similar to the proportion for Cairns LGA at 8.7% and for Queensland at 7.2%. Hence residents of most of the sub-areas appear car dependent for transport.

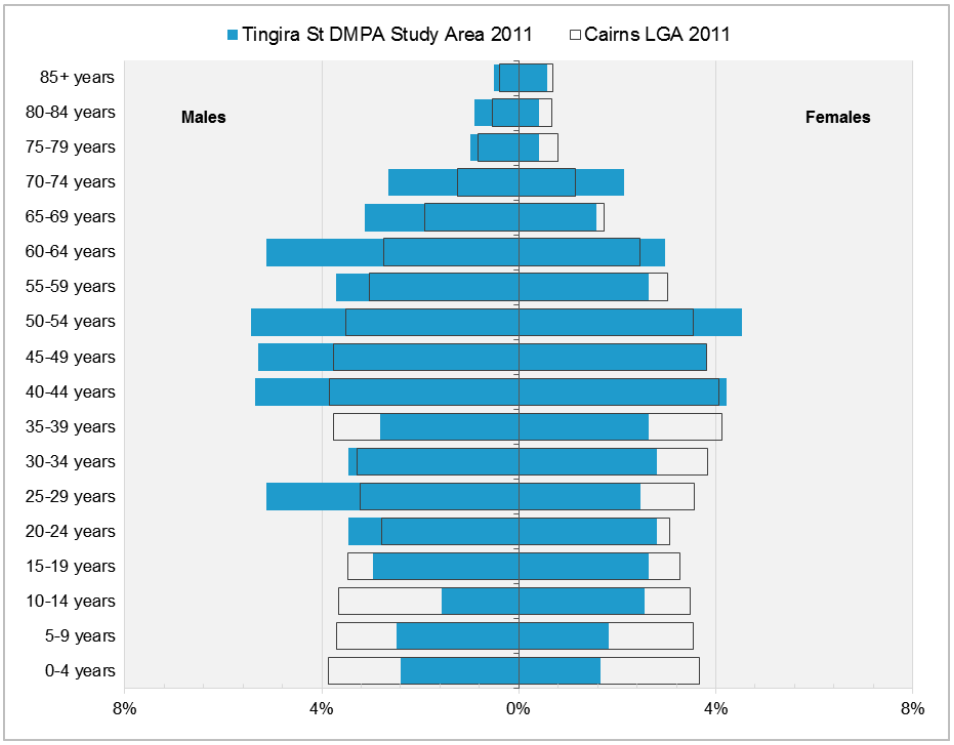
2.3.4 Tingira St DMPA Study Area

Population, age and household characteristics

The Tingira St DMPA Study Area had a resident population of 1,215 people in 2011 (based on place of usual residence). On census night in 2011, an additional 1,237 visitors were counted in the study area. A large number of people would also work in the Tingira St DMPA Study Area and therefore visit regularly on work days, however an estimate of the number of workers was not able to be made as the census place of work data is only available for larger geographic areas (SA2 areas).

The median age of the Tingira St DMPA Study Area population was 42.0 years in 2011, which was significantly higher than the median age for the Cairns LGA and for Queensland, both around 36 years of age. The age profile of the Tingira St DMPA Study Area is shown in **Figure 25** below, and demonstrates that the study area has low proportions of children and younger adults, and higher proportions of older adults from around 40 to 74 years of age when compared to the Cairns LGA in 2011.

Figure 25. Age profile, Tingira St DMPA Study Area and Cairns LGA, 2011



Source: ABS 2013a;

There were just 407 households in the Tingira St DMPA Study Area in 2011. Of these households, 138 were couple families with no children (33.8%), 135 were lone person households (33.2%), 83 were couple families with children (20.5%), 30 were one parent families (7.4%) and 21 were group households (5.2%). Compared to the Cairns LGA and Queensland, the study area had a high proportion of lone person households and couple families without children (see **Table 7**).

Table 14. Household type, Tingira St DMPA Study Area, Cairns LGA and Queensland, 2011

Area	Couple family with no children	Couple family with children	One-parent family	Other family type	Group	Lone person	Total
Tingira St DMPA Study Area	138 (33.8%)	83 (20.5%)	30 (7.4%)	0 (0%)	21 (5.2%)	135 (33.2%)	**407** (100%)
Cairns LGA	14,023 (26.4%)	15,044 (28.4%)	7,141 (13.5%)	574 (1.1%)	2,573 (4.9%)	13,674 (25.8%)	**53,030** (100%)
Queensland	442,309 (28.6%)	479,499 (31.0%)	180,151 (11.6%)	18,870 (1.2%)	72,966 (4.7%)	353,510 (22.8%)	**1,547,304** (100%)

Source: ABS 2011; Queensland Government 2017a;
Note: Data for families and households have been combined here by assuming that secondary families in the small number of multi-family households (748 of 53,030 households) for the Cairns LGA have the same family type as the primary family.

Cultural diversity

There were 67 people in the study area who identified as being Aboriginal and/or Torres Strait Islander people, and this represented 5.5% of the population. This was a low proportion of Aboriginal and Torres Strait Islander people compared to Cairns LGA at 9.2%, but higher than for Queensland at 3.6%.

Around 300 residents of the Tingira St DMPA Study Area were born overseas or 24.9% of the population of the study area, this was a higher proportion than for Cairns LGA at 20.3% and Queensland at 20.5%. Of the population born overseas, 215 people were born in mainly English speaking countries (71%), and 88 people were born in mainly non-English speaking countries (29%) in the Tingira St DMPA Study Area. This was a high proportion of migrants from mainly English speaking countries, compared to Cairns LGA, but similar to Queensland (71% of migrants in the Tingira St DMPA Study Area were from English speaking countries, compared to 47% for the Cairns LGA and 70% for Queensland).

Around 5.8% of the population had migrated to Australia in the preceding five year period, which was a slightly higher proportion than for the Cairns LGA at 4.0% and Queensland at 4.5%.

Socio-economic characteristics

The median weekly individual income for residents of the Tingira St DMPA Study Area was $764, median family income was $1,549 and median household income was $1,193 in 2011 (see **Table 15**). These medians were well above the medians for the Cairns LGA at $624, $1,407 and $1,160 per week respectively. The median weekly individual and family incomes were above the medians for Queensland, but the median weekly household income was slightly less than the median for Queensland. This data may reflect the presence of the HMAS Cairns facility at Draper St.

There were 41 unemployed residents in the Tingira St DMPA Study Area at the time of the census in 2011, which represented an unemployment rate of 5.9%. This was a low unemployment rate compared to the Cairns LGA at 6.7% and for Queensland at 6.1%.

Table 15. Income and employment rate, Tingira St DMPA Study Area, 2011

Population	Median Weekly Income (2011)			Unemployed (2011)
	Individual	Family	Household	
Tingira St DMPA Study Area	$764 (a)	$1,549 (a)	$1,193 (a)	41 (5.9%)
Cairns LGA	$624	$1,407	$1,160	4,983 (6.7%)
Cairns Douglas LGA	$620	$1,393	$1,145	5,264 (6.6%)
Queensland	$587	$1,453	$1,235	131,797 (6.1%)

Source: ABS 2011; ABS 2013a; Queensland Government 2017a;
Notes: (a) Estimated for combined area.

In 2011, 19.7% of employed residents of the Tingira St DMPA Study Area were employed in the public administration and safety industry, 15.2% in accommodation and food services, 8.9% in health care and social assistance and 6.5% in retail trade (see **Table 9**). The defence industry was a key employer with 14.4% of resident workers employed by the defence industry, also presumably associated with the HMAS Cairns facility at Draper St.

Compared to the Cairns LGA, the study area had higher proportions of residents employed in public administration and safety; accommodation and food services; agriculture, forestry and fishing; other services; arts and recreation services, and information media and telecommunications.

Table 16. Industry of Employment, Tingira St DMPA Study Area, Cairns LGA and Queensland, 2011

Industry	Tingira St DMPA Study Area		Cairns LGA		Queensland	
Public administration and safety	130	19.7%	5,779	8.3%	136,818	6.7%
Defence	*95*	*14.4%*	*859*	*1.2%*	*14,885*	*0.7%*
Accommodation and food services	100	15.2%	6,651	9.6%	141,855	7.0%
Health care and social assistance	59	8.9%	8,855	12.8%	242,559	11.9%
Retail trade	43	6.5%	8,216	11.9%	217,610	10.7%
Construction	42	6.4%	6,112	8.8%	183,780	9.0%
Other services	42	6.4%	2,839	4.1%	78,713	3.9%
Agriculture, forestry and fishing	40	6.1%	931	1.3%	55,416	2.7%
Professional, scientific and technical services	33	5.0%	3,459	5.0%	132,754	6.5%
Education and training	30	4.5%	5,534	8.0%	160,921	7.9%
Transport, postal and warehousing	30	4.5%	4,624	6.7%	107,072	5.3%
Manufacturing	25	3.8%	3,534	5.1%	171,669	8.4%
Arts and recreation services	16	2.4%	1,267	1.8%	28,444	1.4%
Administrative and support services	12	1.8%	2,541	3.7%	65,015	3.2%
Rental, hiring and real estate services	12	1.8%	1,360	2.0%	37,007	1.8%
Information media and telecommunications	10	1.5%	642	0.9%	25,358	1.2%
Wholesale trade	9	1.4%	2,216	3.2%	74,288	3.6%
Financial and insurance services	6	0.9%	1,203	1.7%	54,153	2.7%
Electricity, gas, water and waste services	3	0.5%	777	1.1%	24,828	1.2%
Mining	3	0.5%	997	1.4%	52,955	2.6%
Total (a)	**660**	**100.0%**	**69,253**	**100.0%**	**2,039,275**	**100.0%**

Source: ABS 2011; ABS 2013a; Queensland Government 2017a;
Notes: (a) Includes inadequately described and not stated responses.
Based on place of usual residence (not place of work). Light blue highlighting represents industries employing higher proportions of residents in the Tingira St DMPA Study Area compared to the Cairns LGA.

2.3.5 Tingira St DMPA Study Sub-Areas

The sub-areas in the Tingira St DMPA Study Area have low populations and therefore the demographic analysis is less reliable. Small differences in the number of people with a particular demographic characteristic can have a large impact on the reported results of the demographic analysis. In addition, ABS data is confidentialised by random adjustment, and this has more impact on small statistical areas with low populations. These are limitations of the demographic analysis presented in this section, and have been taken into account when considering the implications for the social impact assessment.

Population, age and household characteristics

The resident population of the Portsmith Sub-Area was 230 people at 2011 (based on place of usual residence), while the population of the CBD Wharf St Sub-Area was 487 people. Around 90 people counted in the population of the Portsmith Sub-Area are employed in the defence industry and may be therefore based at HMAS Cairns. This equates to almost 40% of the population of the sub-area and influences the demographic statistics presented in this section.

The median age of the resident population of the Portsmith Sub-Area was 41.0 years of age in 2011 and 48.0 years of age for the Wharf Street Sub-Area. These were higher than the median age for the Cairns LGA and for Queensland, both at 36 years.

Table 17. Population and median age, Tingira St DMPA Study Sub-Areas, 2011

Area	Population (Usual Place of Residence)	Median Age
Portsmith Sub-Area (3115405)	230	41.0
CBD Wharf St Sub-Area (3114504)	487	48.0
Tingira St DMPA Study Area	1,215	42.0
Cairns LGA	145,338	36.0
Cairns Douglas LGA	156,169	36.0
Queensland	4,332,739	36.0

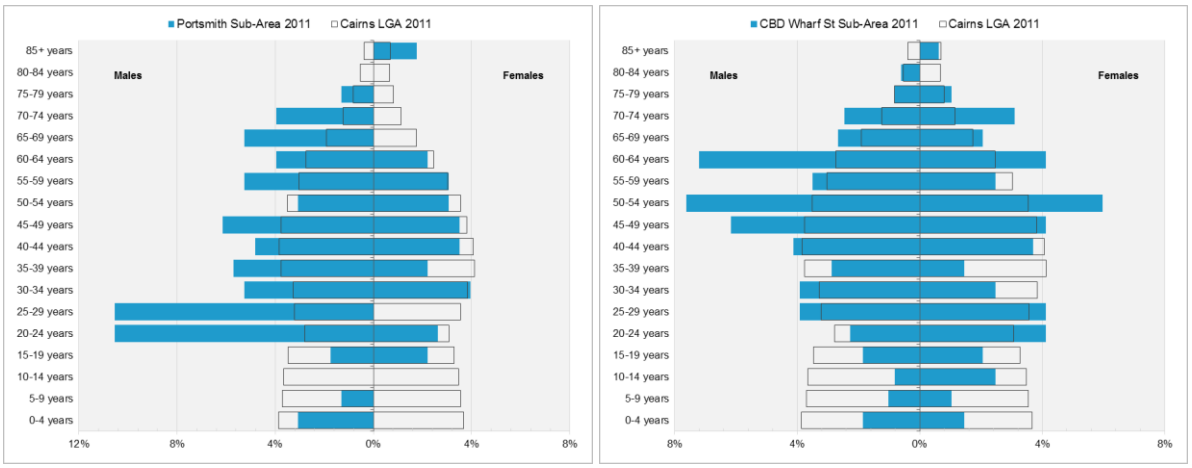
Source: ABS 2011; ABS 2013a;

Age profiles for the two sub-areas are presented below (**Figure 26**).

The age profile for the Portsmith Sub-Area shows that there is a higher proportion of males than females (72% to 28%), and that there are significantly higher proportions of males in the 20-29 year age groups, and higher proportions of males in the 30-79 year age groups compared to the Cairns LGA at 2011. This might to some extent reflect the navy workforce present in the area.

The Wharf St Sub-Area had a lower proportion of children, but higher proportions of some young adult age groups, and significantly higher proportions of 45 to 54 year olds and 60 to 74 year olds.

Figure 26. Age profile, Tingira St DMPA Study Sub-Areas, 2011



Source: ABS 2011; ABS 2013a;

The Portsmith Sub-Area had a high proportion of lone person households (57.1%), compared to the Cairns LGA (25.8%) and Queensland (22.8%), slightly higher proportions of group households (6.1%, compared to 4.9% for Cairns LGA and 4.7% for Queensland) and lower proportions of other household types (see **Table 18**). The Wharf St Sub-Area had a higher proportion of couple families without children, lone person households and group households, compared to the Cairns LGA and Queensland. Around 42% of all households in the sub-area were couples without children compared to 26.4% for Cairns LGA and 28.6% for Queensland. Around 9.5% of households were made up of groups, which was about double the rate for the Cairns LGA and Queensland, and around 31% of households were lone person households compared to 25.8% for the Cairns LGA and 22.8% for Queensland.

Table 18. Household type, Tingira St DMPA Study Sub-Areas, Cairns LGA and Queensland, 2011

Area	Couple family with no children	Couple family with children	One-parent family	Other family type	Group	Lone person	Total
Portsmith Sub-Area (3115405)	9 (18.4%)	5 (11.0%)	4 (7.3%)	0 (0%)	3 (6.1%)	28 (57.1%)	**49** (100%)
CBD Wharf St Sub-Area (3114504)	81 (42.4%)	24 (12.7%)	8 (4.4%)	0 (0%)	18 (9.5%)	59 (31.1%)	**190** (100%)
Tingira St DMPA Study Area	138 (33.8%)	83 (20.5%)	30 (7.4%)	0 (0%)	21 (5.2%)	135 (33.2%)	**407** (100%)
Cairns LGA	14,023 (26.4%)	15,044 (28.4%)	7,141 (13.5%)	574 (1.1%)	2,573 (4.9%)	13,674 (25.8%)	**53,030** (100%)
Queensland	442,309 (28.6%)	479,499 (31.0%)	180,151 (11.6%)	18,870 (1.2%)	72,966 (4.7%)	353,510 (22.8%)	**1,547,304** (100%)

Source: ABS 2011; Queensland Government 2017a;
Note: Data for families and households have been combined here by assuming that secondary families in the small number of multi-family households (748 of 53,030 households) for the Cairns LGA have the same family type as the primary family.

Cultural diversity

In 2011, 51 people living in the Portsmith Sub-Area identified as being of Aboriginal and/or Torres Strait Islander origin which was 22.2% of the population of the sub-area (**Table 19**). This was a high proportion compared to the Cairns LGA at 9.2% and Queensland at 3.6%. The Wharf St Sub-Area had only 4 Aboriginal and Torres Strait Islander people.

A high proportion of the Wharf St Sub-Area were born overseas (35.1%), which was high compared to Cairns LGA (20.2%) and Queensland (20.5%). 26.3% of the population were born overseas in mainly English speaking countries and 8.8% were born overseas in mainly non-English speaking countries.

Around 9.2% of the population of the CBD Wharf St Sub-Area had migrated to Australia in the preceding five year period. This compared to 5.2% of the population of the Portsmith Sub-Area, 4.0% for Cairns LGA, and 4.5% for Queensland.

Table 19. Aboriginal and Torres Strait Islander People, People born overseas, and new migrants, Tingira St DMPA Study Sub-Areas, 2011

Area	Aboriginal and Torres Strait Islander	Born Overseas (English Speaking)	Born Overseas (Non-English Speaking)	Born Overseas, Migrated to Australia in last 5 years
Portsmith Sub-Area (3115405)	51 (22.2%)	33 (14.3%)	15 (6.5%)	12 (5.2%)
CBD Wharf St Sub-Area (3114504)	4 (0.8%)	128 (26.3%)	43 (8.8%)	45 (9.2%)
Tingira St DMPA Study Area	67 (5.5%)	215 (17.7%)	88 (7.2%)	70 (5.8%)
Cairns LGA	13,438 (9.2%)	13,890 (9.6%)	15,580 (10.7%)	5,798 (4.0%)
Cairns Douglas LGA	14,391 (9.2%)	21,669 (13.9%)	9,928 (6.4%)	6,176 (4.0%)
Queensland	155,824 (3.6%)	623,225 (14.4%)	265,411 (6.1%)	196,284 (4.5%)

Source: ABS 2011; ABS 2013a; Queensland Government 2017a;

Socio-economic characteristics

The median weekly individual incomes in the Portsmith Sub-Area and Wharf St Sub-Area were both higher than the median for Cairns LGA and Queensland (**Table 20**). However the median family and household incomes diverged, with the median family and household incomes for the Portsmith Sub-Area being substantially lower compared to Cairns LGA and Queensland, and the Wharf St Sub-Area median incomes being substantially higher. The unemployment rate for the Wharf St Sub-Area was slightly higher at 7.0% than the rate for Cairns LGA and Queensland at 6.6% and 6.1% respectively, however the rate for the Portsmith Sub-Area was lower at 3.7%.

Table 20. Income and employment rate, Tingira St DMPA Study Sub-Areas, 2011

Population	Median Weekly Income (2011)			Unemployed (2011)
	Individual	Family	Household	
Portsmith Sub-Area (3115405)	$814	$1,075	$644	5 (3.7%)
CBD Wharf St Sub-Area (3114504)	$877	$1,784	$1,559	21 (7.0%)
Tingira St DMPA Study Area	$764 (a)	$1,549 (a)	$1,193 (a)	41 (5.9%)
Cairns LGA	$624	$1,407	$1,160	4,983 (6.7%)
Cairns Douglas LGA	$620	$1,393	$1,145	5,264 (6.6%)
Queensland	$587	$1,453	$1,235	131,797 (6.1%)

Source: ABS 2011; ABS 2013a; Queensland Government 2017a;
Notes: (a) Estimated for combined area.

2.4 Community Values

The Cairns Community Plan (CRC, 2011a) articulates the social values of the LGA:

> *"Residents of the region have been attracted for many different reasons over a long period of time. As a result the things people love about the region have added to its unique character as Cairns has grown into an important regional service centre.*

However, there is a constant theme that resonates from residents: lifestyle. Many people say our region's greatest asset is its laid-back and relaxed lifestyle. Some enjoy the fact that Cairns remains liveable with the amenities of a city, yet with the feeling of a big country town.

The diverse culture and history of the Aboriginal and Torres Strait Islander people is integral to the sense of place and community spirit of the region. Also important is the fact the region is multicultural and cosmopolitan with people from all over the world choosing to live and contribute to the diverse lifestyle choices the region has to offer. Aboriginal and Torres Strait Islanders and people from culturally and linguistically diverse backgrounds continue to inspire the arts sector and bring life and vitality to the region.

Of great importance is the outdoor lifestyle encouraged by the region's climate, while the natural setting provides many great destinations within close proximity. All of this is located within a unique natural garden that offers lush wet tropics, green hill sides, tablelands, reefs, ocean and rainforests. Even the cane fields are viewed as a unique and desirable contributor to the landscape. Some even say that they live on vitamin 'G': the green essence that permeates every vista in almost every direction. Hence, the sustainability passion of residents who believe the region must remain known for its green approach to all aspects of life. Finally, the focus on their local community and the desire to keep their space unique and special is paramount in the minds of many."

The vision for the Cairns region from the Corporate Plan 2013-2018 (CRC, 2013) was identified as including valuing the natural environment, lifestyle and surroundings; supporting and respecting distinctive and vibrant communities; being innovative and creative; and growing and diversifying the economy.

From the literature review and the outcomes of consultation (see Section 3), key values which may be relevant to the proposal include the following:

- the natural environment and green backdrop, including the cane fields
- liveability – a great place to live, work and play
- healthy, outdoor recreation opportunities
- world-class infrastructure
- social and environmental harmony
- a sense of community
- multiculturalism and cosmopolitanism
- local villages and suburbs that express their own character and spirit
- a robust, diverse and thriving economy complementing environmental values
- tourism remaining as a significant driver and substantial employer, as well as the rise of other industries
- the global centre of wet tropics living and industry
- protection of rural land
- sustainability - a commitment to minimising the environmental impact of development, while ensuring the region's natural resources and values will be enjoyed by future generations
- pride in the built environment which will continue to reflect a distinctive tropical Far North Queensland character while also utilising contemporary architectural aesthetics and sustainable design principles
- protection of the Great Barrier Reef.

3. Consultation

3.1 Review of Previous Consultation Findings

A large amount of consultation has been undertaken in relation to the CSD project over the period of time in which it has been under consideration since 2012. Relevant findings from various sources were reviewed. A large amount of this consultation pertained to issues related to the initial project phase where marine placement of dredge material was considered, which is now not relevant to this proposal but demonstrates the desirability of land placement.

The overall key outcome of engagement activities was reported by Ports North (2014) to have been broad support for the CSD Project proceeding in relation to the economic benefits it will deliver to the local and regional economy. Job creation was viewed as an important social outcome of this increased economic activity. While the majority of stakeholders were highly supportive of the project proceeding, given the significance of the Great Barrier Reef to tourism and the role tourism plays in the local economy they were also very keen to ensure the reef is protected during the process.

3.2 Review of Consultation for the Current Proposal

3.2.1 Ongoing Meetings and Discussions

Ports North have continued to undertake consultation on the revised proposal and will undertake a further round of consultation during the exhibition of the EIS. Outcomes of current consultation were provided by Ports North and include the following issues:

- a remaining high level of interest in port dredging
- groundwater impacts and flood resuspension at Barron Delta sites
- that EIS should be clear and detailed on demand and economic justification including Cairns versus Yorkeys Knob numbers and growth, with and without the project
- cumulative impacts (eg extra shipping)
- soil quality and geotechnical quality for other uses
- acid sulphate soils
- contamination status of material
- that the past 16 years of rehabilitation at East Trinity should not be reversed by proposed land development or spoil placement, but turned into a wetland park
- that volume reduction had made it a different project
- shortness of the revised EIS preparation period.

3.2.2 Targeted Localised Consultation

A number of additional consultations were requested by the social planning consultant and undertaken by Ports North as part of its engagement program, in order to specifically inform this Technical Study. This focused on consultation in the two placement precincts. Outcomes provided by Ports North included the following:

Barron Delta DMPA Study Area

- no significant issues raised by potentially impacted land owners in the Barron Delta
- the need to maintain access to paddock areas for planting/growing and to cane tramline sidings for harvesting by cane farmers and the need for individual disruption mitigation (pipeline vicinity)
- the possible need for multiple layers of approvals required both for the dredging at the mouth of Richters Creek and installation of the pipeline traversing various land tenures. Early discussion with the relevant statutory authorities to minimise any perceived delays in obtaining approvals was recommended by Council.
- the temporary land based pipeline would not conflict with any proposed future water and waste infrastructure planned by Council in the same timeline

- the temporary land based pipeline would not conflict with any proposed future leisure activity infrastructure planned by Council in the same timeline
- recent contractors undertaking Council's dredging works at the mouth of Richters Creek have improved their operation significantly over those in the early 2000's, and use by the Holloways Beach Environmental Education Centre was much improved with no major issues. The above centre stated no major concerns in regard to noise or direct disturbance to the facility or staff from the Council dredging activity in the Poinsettia Reserve adjacent to the centre. No significant issues were identified in relation to the current process.

Tingira Street DPMA Study Area

- no issues of concern in relation to harbour operation or amenity issues anticipated associated with tenants adjacent to the Tingira Street DPMA
- the placement of dredged material is in line with the purpose of the land and existing activities
- the proposed barge and land activities at the Tingira Street DPMA were similar to existing operations and would not be expected to create any social or amenity issues
- the site selection and design of the common use of barge facility at the proposed new locations for the new dredge barge mooring and unloading area was operationally appropriate
- general interest of tenants in buildings adjoining the Tingira Street DPMA in ensuring no water quality impacts and potential noise impacts if large quantities of rock were being handled.

4. Impact assessment

4.1 Initial Assessment

Future possible impacts of the proposal were identified through a process of prediction based on the profile of the existing social environment including surrounding land uses, the nature of the proposed development, review of documentation on community character and values, and the findings of consultation.

This section initially assesses these potential impacts and assesses their significance by considering the likely changes to the values of the placement area study areas, the pipeline vicinity and Yorkeys Knob, including the social impacts both during construction and operation of the CSD Project.

The significance criteria shown in **Table 21**Table 21 and the classifications of duration of identified impacts shown in **Table 22**Table 22 were adopted for this Technical Study and have been initially used to assess social impacts in line with the assessment process provided.

Table 21. Significance criteria

Impact Significance / Consequence	Description of Significance (examples)
Very High	The impact is considered critical to the decision-making process Impacts tend to be permanent or irreversible or otherwise long term and can affect many people in a major way The social environment is irrevocably changed Impacts cannot be adequately mitigated
High	The impact is considered likely to be important to decision-making Impacts tend to be permanent or irreversible or otherwise long to medium term. Impacts can affect many people in a major way The social environment has major changes Many mitigation measures would be required
Moderate	The effects of the impact are relevant to decision-making including the development of mitigation measures Impacts can range from long term to short term in duration Impacts can affect many people across the community in a moderate way or otherwise affect a small number of people in a major way The social environment is changed in some ways Some mitigation measures would be required
Minor	Impacts are recognisable/detectable but acceptable These impacts are unlikely to be of importance in the decision making process Some mitigation measures may be desirable Impacts tend to be short term or temporary and/or affect few people The social environment is changed in a minor way
Negligible	Minimal change to the existing social environment and few, if any, people affected
Beneficial	Impacts have a positive outcome on the social environment

Table 22. Classification of the duration of identified impacts

Relative Duration of Impacts	
Temporary	Days to Months
Short Term	Up to one year
Medium Term	From one to fifteen Years
Long Term	From fifteen to 50 Years
Permanent / Irreversible	In excess of 50 Years

Potential social impacts have been summarised in **Table 23** below. Factors which have been included in the table from the initial assessment are:

- The potential social impact element
- Who is likely to be affected?
- What is the value likely to be affected?
- What would be the significance of the impact?
- What would be the duration of the impact?
- Would the impact be reversible or irreversible?
- Would there be any consequential or cumulative impacts?

Table 23. Initial Assessment of Social Impacts

Potential social impact element	Who is likely to be affected?	What is the value likely to be affected?	What would be the significance of the impact?	What would be the duration of the impact?	Would the impact be reversible or irreversible?	Would there be any consequential or cumulative impacts?
BARRON DELTA (NORTHERN SANDS) DMPA						
Impact on the character of the northern beaches area						
A change of character of the coastal area	Residents and users of Holloways Beach and Yorkeys Knob	Natural beachfront area	Minor	Temporary	Reversible	No
Potential for change in views from northern beaches	Residents and users of three northern beaches	Uninterrupted ocean views	Negligible	Temporary	Reversible	No
Potential for change in rural character	Residents and users of Yorkeys Knob, Holloways Beach and Machans Beach; and tourists and users of Captain Cook Highway	Rural character of the area, especially the cane lands	Negligible	Temporary	Reversible	No
Impact on local amenity and liveability						
Change in local amenity (from traffic, noise, visual impacts or lighting)	Residents in the immediate vicinity of the pipeline	Rural farming environment	Negligible	Temporary	Reversible	No
	Users of the DMPA and surrounding land users	Amenity	Negligible	Temporary	N/A	No
	Students and staff at Holloways Beach Environmental Education Centre	Natural environment	Negligible	Temporary	Reversible	No

Potential social impact element	Who is likely to be affected?	What is the value likely to be affected?	What would be the significance of the impact?	What would be the duration of the impact?	Would the impact be reversible or irreversible?	Would there be any consequential or cumulative impacts?
	Residents in nearby suburbs, especially those overlooking the DMPA and those in the northern part of Holloways Beach	Living environments	Minor	Temporary	Reversible	No
Impacts on beach and creek use						
Change in use of beachfront and creek mouth	Users of Holloways Beach/Richters Creek mouth	Use of a natural foreshore area	Minor	Temporary	Reversible	No
Effect on use of Environmental Education Centre	Students at Holloways Beach Environmental Education Centre	Natural learning environment	Negligible	Temporary	Reversible	No
Threats to safety and wellbeing	Users of Holloways Beach/Richters Creek mouth	Use of a natural foreshore area	Minor	Temporary	Reversible	No
Restrictions to recreational fishing and boating use	Users of Richters Creek and Acacia Street boat ramp	Use of a natural creek environment	Minor	Temporary	Reversible	No
Change in amenity of environment of Richters Creek	Users of Richters Creek and Acacia Street boat ramp	Natural creek environment	Minor	Temporary	Reversible	No
Impacts on recreational facilities						
Effect on foreshore improvement programmes	Residents and users of foreshore parks	Upgraded foreshores	Negligible	Long term	N/A	No
Effect on future cycleway routes	Users of future planned routes	Unimpeded off-road cycleway routes	Negligible	Long term	N/A	No

Potential social impact element	Who is likely to be affected?	What is the value likely to be affected?	What would be the significance of the impact?	What would be the duration of the impact?	Would the impact be reversible or irreversible?	Would there be any consequential or cumulative impacts?
Impact on livelihoods						
Effect on landowners and affected properties	Canegrowers in the vicinity of the pipeline, Northern Sands Operators and tenants	Agricultural activity	Beneficial	Long term	Irreversible	No
TINGIRA STREET DMPA						
Impact on the character of the Portsmith area						
Compatibility of the use with existing character	Employers, employees and visitors to Portsmith Industrial Area	Port related industrial development	Minor/Beneficial	Short and long term	Reversible adverse/irreversible beneficial	Yes, provision of additional port industrial land
Impact on local amenity						
Change in local amenity (from traffic, noise, visual impacts or lighting)	Employers, employees and visitors to Portsmith Industrial Area	Employment generating industry	Negligible	Short term	N/A	No
Impact on neighbouring land uses						
Change to usage of neighbouring port/commercial activities (including Maritime College, QPS Water Police etc)	Government services located in the area	Community services	Negligible	Short Term	N/A	No
Change to usage of the boat ramp and community facilities (including Wooden Boat Association)	Users of boat ramp and community facilities	Unimpeded use of boat ramp and community facilities	Negligible	Temporary	Reversible	No
Impact on maritime users						
Changes to usage of Smiths Creek	Boat owners/live-aboards	Mooring area	Negligible	Temporary	N/A	No

Potential social impact element	Who is likely to be affected?	What is the value likely to be affected?	What would be the significance of the impact?	What would be the duration of the impact?	Would the impact be reversible or irreversible?	Would there be any consequential or cumulative impacts?
OTHER AREAS						
Impacts on residents in the Wharf Street Area						
Effects of landside construction and increased ship arrivals at the CCLT	Residents in Wharf Street Area	City living environment	Minor/Moderate	Short and long term	Reversible minor/irreversible moderate	No
Impacts on Yorkeys Knob						
Effect of change in ship arrivals in Yorkeys Knob	Businesses and tourism operators	Economic development	Minor/Beneficial	Short and long term	Reversible minor/irreversible beneficial	No
	Members of the Yorkeys Knob community and tourists	Living and tourist environment	Beneficial	Short term	Irreversible	No
	Boat Club	Economic development	Minor/Beneficial	Short and long term	Reversible minor/irreversible beneficial	No
	Ship passengers and crew	Safe and efficient shore transfer	Beneficial	Short term	Irreversible	No

4.1.1 Barron Delta (Northern Sands) DMPA Study Area

4.1.1.1 Impact on the Character of the Northern Beaches Area

Change of Character of the Coastal Area

The coastal area at the mouth of Richters Creek is an isolated and secluded area lying between Yorkeys Knob to the north and Holloways Beach to the south. The pipeline will make landfall and cross the coast near the mouth, thence to the Barron Delta DMPA via cane farm headlands. A pipe storage and lay down area, and a pipe fabrication area, will both need to be provided close by on vacant caneland, and some minor sand cutting may be required across the beach.

Richters Creek is a natural border between the two suburbs, and the pipeline will temporarily change the character of the area. The lay down and fabrication areas will be less visible although they will result in a change in character from truck movement, activity and noise.

The effect is mitigated by the selection of a secluded area for the pipeline to cross, and the short period of time (approximately four months) that the pipeline will be in place. Likewise, the selection of the pipe storage and lay down area and pipe fabrication area are in an isolated area and are unlikely to be visible from the beach.

Council has also undertaken similar works in this area previously. It was noted in Section 2.2.2.1 that Holloways Beach has had major issues with erosion and loss of foreshore areas in the past, and that several structural and replenishment efforts have been undertaken. This has included dredging sand via a cutter suction dredge located at the mouth of Richters Creek and pumping it through pipes to the rock wall and stinger net areas at the southern end of the beach. Between late February and the end of May 2016, a period of three months, there were partial beach closures and minor disruptions to traffic and car parking areas. Minor vegetation removal was also required for machinery access requirements. This previous experience will mean that the proposed works are not an unusual activity in this area. Further, CRC has confirmed that they had not encountered any community issues while undertaking previous pumping and dredging projects in the Northern Beaches.

Hence while there will be a direct adverse effect on the character of this area, this will be temporary and reversible and the social impact is considered to be minor.

Potential for Change in Views from Northern Beaches

It was noted in the description of the proposed project (section 1.2) that soft clay dredge material is to be dredged via a 5,600m^3 capacity Trailer Suction Hopper Dredge (TSHD) discharging to a temporary floating pump out facility between approximately 2.6 and 3.6 km NE of Yorkeys Knob. Dredge material will be pumped via a submerged steel pipeline from the pump out facility.

This activity and the temporary floating pumpout facility will be visible from various points on the Northern Beaches. However the *Landscape and Visual Assessment* (Cardno, 2017) found that the proposed pipelines and associated infrastructure located at Yorkeys Beach will potentially be visible only from elevated viewpoints, or coastal areas in close proximity to the booster pumps, and the visual effect of these would be attenuated by distance. Marine-based infrastructure is more likely to be noticeable on the surface of the water. However visual intrusion of the dredge, pipeline and associated infrastructure was considered negligible.

Of the more southern suburbs of the Northern Beaches (Yorkeys Knob to Machans Beach), Yorkeys Knob is positioned best to take advantage of ocean views, and the socio-economic characteristics of this community suggest that more advantaged residents have taken up these opportunities, with good quality housing being built with expansive views.

The outcomes of the visual assessment suggest that these residents will not be disadvantaged by a reduction in views or any effect on house prices. Likewise, residents at Holloways Beach and Machans Beach are not expected to be adversely affected by a change in their view.

Hence there will be minimal direct adverse effect on the views obtained by residents of this area. Further, this will be temporary and reversible. The social impact therefore is considered to be negligible.

Potential for Change in Rural Character

A key value expressed in Council strategies and plans is the retention of the natural environment and green backdrop of Cairns, including the cane fields. "The green essence that permeates every vista in almost every direction" was specifically identified in the Community Plan (see CRC 2011a). This vista is also available to tourists as they drive along the Captain Cook Highway through cane fields; to residents in suburbs that overlook the Barron Delta (parts of Stratford and Freshwater) or tourists on the Skyrail or on planes; and residents who drive through cane fields to Yorkeys Knob, Holloways Beach and Machans Beach.

Visually, the effect of the pipeline in a cleared 100m wide corridor across cane lands has been identified by the *Visual and Landscape Assessment* (Cardno, 2017) as not likely to be overt or apparent from elevated views, due to the viewing distance, intervening vegetation (including sugar cane) and the inherently low elevation of the infrastructure. While the corridor could be expected to appear as a swathe through mature cane fields, depending on the time of year of the operation it could be indiscernible from a harvested cane field. The route has also been planned as far as possible to cut through cane headlands (the area at each end of a planted field for turning), which is a mitigating measure inherent in the concept. Further, the pipeline will pass under the Captain Cook Highway in a culvert. It is therefore unlikely that highway users will realise they have crossed the pipeline.

The *Visual and Landscape Assessment* (Cardno, 2017) noted however that during the construction phase, a bund would be constructed to 7.5m AHD around the Barron Delta (Northern Sands) DMPA, which would be glimpsed by passing highway motorists through gaps in vegetation, as well as seen locally. It would also be visible from elevated viewpoints, including the Skyrail and Henry Ross Lookout, from planes departing or leaving Cairns airport, and from elevated residences located in foothill suburbs. Nevertheless, the operational activities were seen as likely to be similar to the current sand extraction and landfill operations, and not introduce additional visual impacts. This was evaluated as a temporary impact affecting a site which is currently disturbed by sand extraction, and within the context of a surrounding district with a mosaic of different land uses and activities. Lighting and vehicular movement will also be visible at night from elevated viewpoints, although it will be seen as part of cluster of lighting associated with the Captain Cook Highway, Smithfield and other commercial activities which either operate at night, or are lit, throughout the Barron Delta.

The placement of the dredged material in the DMPA should make no discernible difference to vistas available over the Barron Delta. On completion, the DMPA will appear as a lake, as it currently does.

The selection of the pipeline route, its design passing under the Captain Cook Highway, and the selection of the DMPA are all inherent mitigation factors in lessening any impact on the rural character of the study area.

Hence it is considered that there will be no adverse social impact on the rural character of the DMPA study area.

4.1.1.2 Impact on Local Amenity and Liveability

Change in Local Amenity

There are several different social environments around various parts of the concept proposal:

- the rural farming area through which the pipeline passes
- the DMPA
- Holloways Beach Environmental Education Centre
- nearby residential areas.

It is proposed that on land the pipeline (1m diameter) will be placed above-ground on earth 'saddles'. For the majority of its route it will run through cane farms[7]. The pipeline will require a construction corridor and road access along the length of its route. The corridor needs to be of sufficient width to allow for delivery of the pipe by truck, the unloading and installation of pipe components, and vehicle access for inspection and maintenance throughout the dredging program. Hence a broad pipeline alignment route up to 100m wide has been proposed.

The pipeline cross over and laydown area for the ocean-based pipeline construction will be located close to the creek mouth, inland from and on the opposite side of Richters Creek to the Education Centre. There will also be a pipeline fabrication yard and a general works area for the dredging contractor (e.g. storage of plant and equipment, temporary workshop etc.) in the same area. The pipeline will be delivered to Cairns either by road transport or sea freight in components typically up to 12m in length. The pipe components will need to be transported by road to land and ocean-based laydown areas.

The above elements will all be foreign to the current environment.

Rural Areas
Only 6 farmhouses have been identified in the rural areas in the vicinity of the pipeline. The noise assessment (Ask, 2017) found that noise emissions from pipeline construction and decommissioning would not significantly impact sensitive receptors such as rural residences. Noise emissions from booster pump stations may result in moderate noise exceedances but it was expected that further mitigation (i.e. bunding or quieter plant selection) would result in compliance with the noise limits.

The Transport Assessment (Chapter B14, revised Draft EIS) identified that there would be traffic generation associated with the establishment, operation and disestablishment of the pipeline, and in the case of rural properties, this would involve the delivery of the land-based pipe (12m) sections during the first 2 weeks of establishment and removal during the last 2 weeks of the disestablishment phase. These movements are anticipated to be evenly distributed between three land-based laydown points – one accessed from Yorkeys Knob Road, one from Holloways Beach Access Road and one at the DMPA itself. The pipeline haulage operation will generate 278 B-Double equivalent trips (139 Establishment/139 Disestablishment) for the land-based pipeline delivery/removal and 136 B-Double equivalent trips (68 Establishment/68 Disestablishment) for the ocean-based pipeline delivery/removal over a 2 week period during the establishment period and the disestablishment period.

There would also be 32-33 light vehicle trips and two to three heavy vehicle trips per day from the transport of plant, cribbing and fencing to the sites and workforce. During operation of the pipeline these would decrease to an average of nine light vehicle trips and three heavy vehicle trips per day.

Owners, lessees and workers on farms would commonly experience the effects of heavy machinery, cane haulage trains, dust and noise from the operations of the farms at certain times. These are clearly considered part of farming life. While the pipeline haulage operation will create unusual heavy vehicle haulage onto private properties, the effects of the proposal are considered likely to be able to be similarly tolerated. Noise at night is not expected to be such at any residence that sleep or daily living such as watching TV would be interrupted.

The effect of the works will be mitigated by the short period of time during which they will be undertaken, particularly in regard to the delivery and removal of pipe sections. Farmhouses not on the directly affected properties are likely to be so distant that any noise emerging will blend into normal background noise. No significant issues were raised during consultation by Ports North with potentially impacted land owners in the Barron Delta.

Hence it is considered there will be no adverse social impact on the amenity of the surrounding rural areas.

DMPA

[7] The effects on the beach and Richters Creek are considered below

The DMPA was noted in Section 2.2.2.1 to be located in a mainly agricultural (including aquaculture and cane farming) area, with some other scattered uses along the Captain Cook Highway, such as a motorcycle track and Go-Kart track and Laser Tag Arena entertainment facility.

The Northern Sands quarry (the site of the DMPA) itself contains several uses – the primary sand mining operation, a Boral concrete batching plant and a commercial dump. The existing operation could be expected to generate heavy vehicles, constant traffic and machinery operation, and to have a low quality visual, noise and air quality environment.

The dredged material will be delivered into the DMPA as a slurry through the dredged material pipeline. The dredged material may be handled upon entry into the pond by conventional earthmoving equipment (e.g. dozers, excavators, etc.) to ensure it is distributed to all areas of the DMPA.

The type of operation proposed would consequently not be substantially different from that undertaken on the site. This is a mitigating measure inherent in the proposal, such that little change should be experienced to the amenity of the area. It is also noted that there are noisy activities already existing in the surrounding area. A further mitigating factor is that the works will be in operation only for a short time, following which normal operations at Northern Sands will continue.

Hence it is considered that there will be no adverse social impact on the amenity of the DMPA area.

Holloways Beach Environmental Education Centre
Holloways Beach Environmental Education Centre is the closest neighbouring use to the location at which the pipeline will cross the coast, and the pipeline lay down areas. It is in a relatively isolated location near the northern tip of Holloways Beach on the southern side of Richters Creek. The current environment of the centre is low key. Facilities appear very basic and relatively old, although there have been improvements such as greenhouses. The setting of accommodation buildings is among natural dunal vegetation, with much of the remainder of the site grassed. The centre is separated from the creek mouth by Poinsettia Reserve, within the southern part of which it is located. There are some tracks through this reserve, however the vegetation is dense in the northern part.

The works proposed would not be visible from the centre, and there would be no increase in vehicle traffic past the centre. It is noted from consultation undertaken by Ports North that the centre had no major concerns with regard to noise or direct disturbance to the facility or staff from Council's 2016 dredging works, and that no significant concerns were held in relation to the effects of the current proposal. The noise environment of the centre may be slightly changed by the pipeline establishment, vehicle movements during operation of the pipeline, minor excavation works during pipeline installation and removal, and the activities at the laydown area. However the Noise Assessment (Ask, 2017) confirmed that noise emissions from pipeline construction and decommissioning would not significantly impact the centre. Minor night time noise exceedances from booster pumps under adverse conditions at the Environmental Centre were identified; however it was expected that further mitigation (i.e. bunding or quieter plant selection) would result in compliance with the noise level targets.

Hence any social impact on the amenity of the centre is considered to be negligible. Any effect on the amenity of the environment of the Environmental Centre would in any case be mitigated by the short period of time during which works will take place.

Nearby residential areas
The social environment of surrounding residential communities was described in Section 2.2.2.1. The analysis noted that there were no nearby urban settlements to the DMPA, and indeed the site appears to lie in the middle of five surrounding communities which essentially turn their backs on the Delta.

Of the five surrounding communities, the route of the pipeline passes between Yorkeys Knob and Holloways Beach. The urban areas of Yorkeys Knob lie to the north of the site some distance along the beach, and to the west along Yorkeys Knob Road (approximately 900 metres from the laydown area). Yorkeys Knob primary school is located approximately 1,000 metres to the north-west from the laydown area.

The closest urban areas are the northern extension of Holloways Beach along Poinsettia Street, with houses approximately 750 metres from the laydown area; and those in a small enclave in Acacia Street near the boat ramp (a similar distance). The dwellings in Acacia Street are also within approximately 150m from the boat ramp, however at this point the pipeline is located some distance away on the other side of wetlands on the side of the creek. Both of these urban areas are also separated from the laydown and dredging areas by a large area of reserve (Poinsettia Reserve).

Dwellings at Baronia Crescent are approximately 750m from a booster pump however they are separated by a bend of the creek and a wide belt of mangroves on either side of the waterway.

The Noise Assessment (Ask, 2017) found that noise emissions from pipeline construction and decommissioning would not significantly impact any of these sensitive receptors. Minor night time noise exceedances from booster pumps under adverse conditions at the three closest receptors were identified; however it was expected that further mitigation (i.e. bunding or quieter plant selection) would result in compliance with the noise level targets.

The location of the DMPA is consequently a mitigating factor inherent in the proposal. A further mitigating factor is the short period of time over which the operation will take place.

Hence while there will be a direct adverse effect on the amenity of the closest urban areas in Holloways Beach, this will be limited to a small number of dwellings, it will be temporary and reversible and the social impact is considered to be minor.

4.1.1.3 Impacts on Beach and Creek Use

Change in Use of the Beachfront and Creek Mouth

It was noted above that Richters Creek is a natural border between the two villages, and it is most likely a termination point for dog walkers from Yorkeys Beach, who are able to walk dogs off leash at the southern part of the Yorkeys Knob suburb. It is also noted that environmental and bird-watching groups, and some people beach/sand bank fishing, use the creek mouth area. Establishment of the pipeline would mean that the beach may need to be partially closed at this point.

The effect is mitigated by the selection of a little used area for the pipeline to cross, and its coincidence with the natural boundary provided by the creek. It is also mitigated by the short period of time (approximately four months) required for establishment and for the pipeline to be in place. Likewise, the selection of the pipe storage and lay down area and pipe fabrication area are in an isolated area and unlikely to be highly apparent to users of the beach.

For the few walkers or environmentalists utilising this area there will be minor inconvenience and a small change to the natural character of the beach for a short period of time (six weeks). It is anticipated that the fabrication of the pipeline and the dismantling process will require use of these areas for a slightly longer period of time, another three weeks for installation and two weeks for dismantling. The process as a whole will therefore take place in less than three months, and is proposed to be undertaken mid-winter when there may be less beach usage. Some noise and traffic movement may be apparent to the few users on the beach during this period; however overall the social impacts on the users are anticipated to be few.

It was noted above that Council has previously undertaken works dredging sand from the mouth of Richters Creek and pumping in this area. This included partial beach closures. Works in this area are therefore not an experience with which users are unfamiliar.

Hence while there will be a direct adverse effect on users of the beach and creek mouth, this will be temporary and reversible and the social impact is considered to be minor.

Effect on Use of the Environmental Centre

The Holloways Beach Environmental Education Centre was established in 1990 at the northern end of Holloways Beach. Outdoor and environmental education centres (O&EECs) are provided by the Queensland Department of Education and Training (DET) to promote, develop provide and deliver highly effective outdoor and environmental education programs for schools and the community, and provide professional development for teachers. Strong links are fostered with local communities by providing information about environmental issues and serving as venues for community forums. Holloways Beach is currently one of 26 in the state.[8]

The centre's facilities include an air-conditioned administration block with conference room, a fully established kitchen and four air-conditioned cabins with shower and toilet, each capable of accommodating 11 persons and an additional donga capable of sleeping an extra 9 persons.

The centre is located to enable students' easy access to mangrove, estuarine, beach and urban environments. Boating, water quality testing, aquariums, crab tagging, mangroves, beach and urban programs are offered to students from Year 5 to Year 12 on overnight camps and day excursions.

The close proximity of rainforests and freshwater creeks also enables the centre to work with local primary and secondary schools in developing water quality projects, historical trails, recreational studies and Aboriginal cultural programs. Personal development programs involving leadership, group cooperation, trust, initiative and problem-solving activities are used to promote active informed citizenship in groups camping at the centre.

The centre also offers outdoor education experiences with its high ropes course on location and close proximity to abseiling/rock climbing, canoeing/kayaking and expedition venues in the Cairns region[9].

Clearly the relationship to the Richters Creek estuary, surrounding wetlands and beach environments is critical to the functioning of the Environmental Centre. The centre utilises the Acacia Street boat ramp for launch and retrieval of boats for small groups of school students on a regular basis, and for conduct of water quality and mud crab monitoring in the Richters-Thomatis Creeks and Barron River area.

However based on the views expressed during consultation, and the fact that no major concerns were expressed in relation to the 2016 Council creek mouth dredging operation, which had a pipeline extending from the creek mouth to the public beach area to the south running the full length of beach adjacent the centre, it is not expected that the project will impact on the users and management of the facility. There may even be a positive impact in terms of providing learning and monitoring opportunities arising from the project.

Threats to Safety and Wellbeing

The local beach and estuarine environment, whilst subject to the normal threats from nature, provides a relatively safe location for passive recreation, primarily fishing and walking. The sand cutting and pipeline works will present potential threats to public safety.

The concept proposal includes partial closure of the beach to fence off these activities and to mitigate any risk to the public along with mitigation of vandalism for the period of the project. Appropriate site security, fencing and signage will be used to minimise such impact elements.

It is noted that for purposes of safety and risk relating to boating in Richters Creek, the concept design incorporates the submerging of the pipeline to cross the creek, rather than a temporary trestle bridge. Adequate clearance for boats will be provided. In addition mitigation measures could include a 'Submerged Pipeline' sign on the bank with depth information.

In both cases, while there is an environmental risk inherent in the project, subject to detailed design the mitigation measures proposed are considered adequate to minimise risks to public safety and wellbeing. Hence while there

[8] http://education.qld.gov.au/schools/environment/outdoor/index.html

[9] http://education.qld.gov.au/schools/environment/outdoor/holloways.html

will be a direct adverse effect on users of the area, this will be temporary and reversible and the social impact is considered to be minor.

Restrictions to Recreational Fishing and Boating Use

Richters-Thomatis Creek is a tributary system to the Barron River which is used for recreational fishing. It is however described not as a 'fishing mecca' due to the proximity to Cairns and the Northern Beach suburbs, and fishing can be difficult[10].

The area is recognised as a declared fish habitat for its natural values of mangrove-lined creeks and wetlands. It's fisheries values (together with Yorkeys Creek) are for recreational and Indigenous fishing; barramundi; blue salmon; bream; estuary cod; grunter; mangrove jack; queenfish; whiting; and tiger prawns[11].

Land based people fish the river mouth from the sand banks. Boats launch from the boat ramp at Acacia Street, Holloways Beach and can travel downstream a short distance toward the river mouth or upstream. Upstream, Richters Creek is fed by Thomatis Creek and other feeder creeks.

The concept proposal is for the pipeline to cross Richters Creek upstream of the boat ramp. This will be by way of a submerged pipe laid on the bed of the creek. The pipe would be constructed on one side then pulled (or floated) across the creek and sunk onto the creek bed.

This will involve a two-day period of installation and a similar period for removal, during which access upstream from the boat ramp will be restricted. Similarly, land fishing at the mouth would be restricted during minor excavation works to establish and remove the pipeline.

The effect of the restriction will be mitigated by the short period of time during which access upstream will be impeded, and the remaining availability of some areas of the mouth and other parts of the creek for fishing at all times during the works. Altogether, the concept proposal will affect recreational fishing only for a temporary period. The effect would be further mitigated by signage and advertising (including mapping) advising of the restrictions and their period of applicability.

Hence while there will be a direct adverse effect on recreational fishing and boating, this will be temporary and reversible and the social impact is considered to be minor.

Change in Amenity of Environment of Richters Creek

The current environment of Richters Creek is one of quietness and solitude. The works above will create some disturbance to this environment through the generation of noise, activity and disturbance of the natural environment.

Noise will arise from a set of booster pumps located close to the creek, just upstream of the boat ramp, from traffic associated with trucks delivering and removing pipes to the laydown area, and from works to submerge the pipeline crossing the creek. The latter will also generate activity such as ramping down to creek level with earthmoving machinery, and vegetation removal.

This disturbance will change the environment of the creek for a temporary period. The Noise Assessment (Ask, 2017) identified various sources of noise during the establishment period and some from booster pumps during operation. This will affect land-based people fishing on the sand banks at the mouth of Richters Creek and to a lesser extent those who are boating. Those boating will be able to travel upstream to quieter spots. It may also affect students of the Holloways Beach Environmental Education Centre, who utilise the creek and river mouth for

[10] https://www.fishingspots.com.au/s/thomatis-creek/

[11] https://www.npsr.qld.gov.au/managing/area-summaries/yorkeys.html

educational purposes. However, again alternative locations may be able to be utilised while the main impacting stages of the project activities (such as pipeline assembly and installation) are occurring.

The effect on amenity of the creek environment will be mitigated by the short period of time during which it will occur, and the availability of some alternative parts of the creek which will not be affected. As above, the effect would be further mitigated by signage and advertising (including mapping) advising of the works and their duration, which may result in other locations being sought during this period.

Hence while there will be a direct adverse effect on the amenity of the creek environment, this will be temporary and reversible and the social impact is considered to be minor.

4.1.1.4 Impacts on Recreational Facilities

Effect on Future Foreshore Improvement Plans

The Holloways Beach Foreshore Improvement Plan recently on exhibition at Council[12] includes a recommendation that:

> *"It is important to activate the northern section of the foreshore. This can be achieved by providing recreation opportunities at the northern most section of the study area. A BBQ/ picnic shelter would provide the local community another location to gather and would active the space. If complemented with other elements it would add significant recreation value for residents."*

This would result in more public recreation at the northern section of the beach potentially closer to areas which would be subject to the proposed works (**Figure 27**).

Figure 27. Holloways Beach improvement program, Northern section

Draft plans of the proposed improvements[13] however show these no further north than the end of Casuarina Street; and the recommendation is medium-term. Works are estimated to be completed and the area restored by this time.

It is therefore not considered that there would be any impact arising in relation to this proposal.

[12] http://www.cairns.qld.gov.au/council/have-say/open/draft-holloways-beach-foreshore-improvement

[13] http://www.cairns.qld.gov.au/__data/assets/pdf_file/0014/201038/Holloways-Beach-Plans-reduced.pdf

A foreshore improvement and vegetation management plan for Yorkeys Foreshore and Goodward Park (at the southern end of the beachfront urban area) was prepared by CRC in 2015[14]. The plan retains the southern section of the beach in its natural setting.

The concept proposal will return the beach area to its natural state. The proposal is temporary and reversible. It is therefore considered that there would be no social impact arising in relation to these improvement programs.

Effect on Future Cycleway Routes

There is also a recommendation in the Holloways Beach Foreshore Improvement Plan[15] for the Holloways Beach foreshore path to join to the Northern Beaches Leisure Trail:

> *'The cycleway will ultimately be part of the Northern Beaches Leisure Trail, which will extend from the CBD to Palm Cove to offer cyclists a safer alternative to the Captain Cook Highway. It will also link with the future Wangetti trail' (Palm Cove to Port Douglas).*

The Department of Transport and Main Roads (DTMR) identifies networks of core cycling routes in Queensland in collaboration with local governments. These are outlined in network plans for each region and shown in the Principal Cycle Network Plan: Far North Queensland (Queensland Government, 2016f).

A connection of the principal cycle network between Yorkeys Knob and Holloways Beach is identified in the plan as a future principal cycle route (**Figure 28**). Future principal routes identify expansion opportunities for the principal cycle network in areas where significant urban growth has been identified but land use planning has not yet been undertaken or finalised. Hence the exact alignment of the future link may change after more detailed planning.

[14] http://www.cairns.qld.gov.au/council/have-say/closed/yorkeys-foreshore#sthash.HMpaKW6z.dpuf

[15] http://www.cairns.qld.gov.au/__data/assets/pdf_file/0013/201037/Holloways-FS-MP-Final-Draft-low-res.pdf

Figure 28. Principal cycle network, Northern Beaches

There are a couple of options recently investigated (in 2016) for the trail by Council according to the Holloways Beach Foreshore Improvement Plan Draft Report[16], a coastal one across Richters Creek near the boat ramp and an inland one, which both would cross the pipeline route. These are shown on Figure 29.

[16] http://www.cairns.qld.gov.au/__data/assets/pdf_file/0013/201037/Holloways-FS-MP-Final-Draft-low-res.pdf

Figure 29. Proposed options for Northern Beaches Leisure Trail connection between Yorkeys Knob and Holloways Beach

The Northern Beaches Leisure Trail is however noted to be a long-term plan with staged implementation. Consultation with Council has identified that the timing and route of such project is undefined at this stage and unlikely to coincide with the project.

The proposal of the pipeline and accompanying works is temporary and reversible. Its timing, subject to approval, is anticipated to be short-term. It is therefore considered that there would be no adverse social impact arising in relation to this recommendation.

4.1.1.5 Impacts on Livelihoods

Effect on Landowners and Affected Properties

Northern Sands is an active long-term sand mining operation. However it is understood that recent recycling operations have significantly restricted the volume of material being placed in the void to the point that operational life of the waste disposal operation is greater than 30 years.

The concept proposal will provide an alternative source of fill which will be of economic benefit to the landowner.

Hence it is considered that there will be beneficial impacts to the landowner of the DMPA.

There are anticipated to be no adverse social impacts on affected rural properties and the concept proposal has been designed to minimise any impact on farming operations. Any economic impact on pipeline land owners would be compensated.

4.1.2 Tingira Street DMPA Study Area

4.1.2.1 Impact on Character of the Portsmith Area

Compatibility of the Use with Existing Character

It was noted in Section 2.2.2.2 that the Tingira Street DMPA comprises two sites located on reclaimed Ports North land at Portsmith, a largely industrial area to the south of the Cairns CBD. The land is zoned Strategic Port Land under Cairns Plan 2016 and is surrounded by additional Strategic Port land and industrial areas to the north and west, and conservation areas to the west, south and east (on the opposite side of Smiths Creek).

The sub-area of the Tingira St DMPA Study Area containing the sites is located within areas designated as Waterfront Industry Planning Area and Industrial Planning Area.

In line with the intent of the Waterfront Industry Planning Area, the immediately surrounding area contains a diverse range of marine related industrial uses including low-impact industrial and port activities. The continued operation and expansion of these marine orientated industries and activities is encouraged and anticipated, including that of the subject land, which regardless of the project will be filled and utilised for industrial purposes.

Future development within the area would not compromise the operation of the port or the environmental qualities of Trinity Inlet and Smith's Creek, and would be in line with the development of support under the ports land use plan. It would consequently be quite compatible with the existing operations and character of the Portsmith industrial area.

The concept proposal will concurrently prepare further land for industrial development. It is therefore considered that the social impact would be beneficial.

4.1.2.2 Impact on Local Amenity

Change in Local Amenity

The Portsmith Industrial Area is an important economic and employment hub for Cairns. The current amenity of the area is busy, thriving, in some places noisy, and generally has the appearance of a hive of activity. A large number of workers are employed in the Tingira St DMPA Study Area, and any changes in amenity would primarily affect these. There were relatively few people found to be living in the large Statistical Area which includes the Tingira St DMPA.

The sites will be filled with dredged stiff clays transferred to shore in dumb barges via temporarily moored barge mounted excavators loading heavy haulage vehicles at two barge ramps. Minor earthworks including temporary piles may be necessary at the ramps to facilitate unloading.

The filling of sites for industrial use is an ongoing activity in the development of the Strategic Port lands and one which would be commonly expected by workers in the area. The effect is mitigated in this case by the concept proposal selecting utilising locations which are relatively segregated from existing industrial and port development and at the end of a largely (as yet) undeveloped cul-de-sac. This location ensures that it will have minimal effect on the working environment of the industrial area. It is also mitigated by the temporary nature of the activity.

Further, Ports North purchased 10,000m^3 of fill some years ago with the intention of continuing with a rolling program of shifting/repositioning this onto the sites in approximately 1 ha areas after 1 to 2 years in place. The receipt of dredge material will avoid a significant amount of re-handling earthworks in the area, and can consequently be considered a beneficial outcome on local amenity.

The Regional Harbour Master confirmed through consultation that the placement of dredged material in the Tingira Street DPMA was in line with the purpose of the land and existing activities, and would be beneficial in terms of filling and surcharging the less the land in a less disruptive manner as opposed to ongoing relocation of existing surcharge material or importation of fill by road.

Any limited effect on amenity would be temporary and reversible. It is therefore considered that there would be no adverse social impact arising in relation to the activity.

4.1.2.3 Impact on Neighbouring Land Uses

Change to Usage of Neighbouring Port/Commercial Activities

It was also noted that there are various Government agency offices/operations contained in a complex of modern buildings adjoining one site and relatively close to the other:

- Queensland Police Service (QPS) Water Police
- National Parks and Wildlife Service (NPWS) Cairns District Operations Centre
- Wet Tropics Management Authority Yellow Crazy Ant Eradication Office
- Australian Maritime Safety Authority (AMSA) Queensland Operations Base.

These users may have different expectations of a work environment (i.e. Government offices), although three of the agencies are involved in port related waterfront activities. Internal discussions undertaken with the QPS Water Police, NPWS, Wet Tropics Management Authority and AMSA did not indicate any foreseeable social impacts, but raised only general interest in ensuring no water quality impacts and potential noise impacts if large quantities of rock were being handled. It was noted that the adjacent existing barge ramp had been utilised to supply rock via barges for a number of remote projects in recent years without issue by tenants and it is not anticipated that the stiff clay materials will contain significant quantities of rock.

The works would also be temporary and reversible. It is therefore considered that there would be no adverse social impact arising in relation to these land uses.

Change to Usage of the Boat Ramp and Community Facilities

Four community uses are located within the vicinity of the sites:

- a public boat ramp, parking and amenities
- Wooden Boat Association clubhouse and yard
- Great Barrier Reef International Marine College

- Cairns Cruising Yacht Squadron, including a bar, public restaurant, shipyard and marina.

The Smiths Creek boat ramp is a well used large public ramp and car park offering wash down and rigging areas. It is lit for night usage, and has a floating pontoon. There are public toilets at the entry to the carpark. It has no direct access to the sites other than by Tingira Street, in common with other uses.

Usage of the boat ramp, car park and amenities would not be expected to be impeded by the activity. While the barge ramps may temporarily increase marine traffic past the pubic boat ramp, it is not expected that this would cause any undue delays or interference with the use of the boat ramp.

It is understood that the Wooden Boat Association property is used by both the Wooden Boat Builders and representatives of the Cairns Maritime Museum Inc. This use is on casual month-to-month leasehold basis and offered as a community service by Ports North. The proposed dredge material placement will not displace or interrupt this use, however any minor amenity issues would be expected to be tolerated given the chosen location and tenure of the presence.

The Great Barrier Reef International Marine College (GBRIMC) provides maritime training to local, national and international clients, as part of the TAFE Queensland network. It is located on the western side of Tingira Street without direct waterfront access and opposite a site that is currently being filled.. The college is a new state-of-the-art training facility including training rooms, simulators, engineering workshops, an immersion pool and a training vessel. Its location was selected as highly appropriate for a marine oriented training school, and it is therefore anticipated that the activities undertaken in the surrounding port area are considered compatible. No impacts on the ability of the TAFE to operate are envisaged.

The Cairns Cruising Yacht Squadron is located on the eastern side of Tingira Street, approximately 400 metres from the closest site. It has extensive member and public usage, including functions, indoor and outdoor dining and use of the lawn overlooking Smiths Creek with a view to Admiralty Island opposite. It also provides a deep water frontage with a pontoon for members and dinghy tieups from live-aboards or visiting boat owners. These uses are an important part of the club's operation and its location is clearly valued by the club and users. No interruption of these uses is envisaged, and the view of passing barges at this point could only be considered part of the interesting marine precinct in which it lies.

The works would also be temporary and reversible. It is therefore considered that there would be no adverse social impact arising in relation to these community uses.

4.1.2.4 Impact on Marine Users

Changes to Usage of Smiths Creek

The Port of Cairns has 65 pile moorings, for craft up to 18m (59') in length, on the eastern side of Trinity Inlet. There are also areas designated for anchorage only north and south of the piles, east of Admiralty Island and in Smiths Creek[17]. Smith Creek tends to be a quieter mooring area in terms of passing traffic the further upstream moorings are located. However there is undoubtedly noise from existing industrial, marine and barge operations. There may also be wash.

Barges loaded with dredged stiff clays will pass these moorings to access the new barge ramps. It is not anticipated that live-boards or boat owners would be unduly impacted by the operations of the additional barges.

The barges would also be temporary and reversible. There would be no ongoing barge movements after the dredge material placement is completed. It is therefore considered that there would be no adverse social impact arising in relation to these marine users.

[17] http://www.portsnorth.com.au/pdfs/cairns/InformationSheet_CairnsBerthsWharves.pdf

4.1.3 Other Areas

4.1.3.1 Impacts on Residents in the Wharf Street Area

Effects of Land Based Wharf Upgrades, Dredging and Change in Number of Ship Arrivals

Residents in the Wharf Street area form part of the Study Area identified in Section 2.2.2.1. and 2.3.5. This area forms part of the Cairns city centre. The city centre contains major infrastructure, is the dominant centre for office based employment including head offices and government agencies, and has an active and vibrant night economy support by tourist activity, while maintaining a desired standard of amenity. In 2011 it contained just under 500 residents. In the Wharf/Abbott/Lake Street block opposite the Cairns Cruise Liner Terminal (CCLT) there were three apartment buildings identified, providing a mix of residents and holiday rentals. One large scale high-rise tourist/residential development is located directly opposite the CCLT and its car park, on Wharf Street.

It was noted that as anticipated from the above planning framework, the Wharf Street area is a lively and vibrant precinct. Further permanent residential development is encouraged to complement tourist activity. The terminal itself has been recently redeveloped to accord with Cairns tropical design and retain important heritage elements, and is surrounded by an attractive and active landscaped public domain.

The concept proposal will involve widening and deepening of the Cairns Shipping Channel and improvement of navigation and wharf facilities to accommodate larger cruise ships and facilitate a future expansion of HMAS Cairns Navy Base. It will enable an increased number and size of cruise ships to be berthed at the CCLT.

At the present time, cruise ships visiting Cairns either berth at the CCLT or anchor 4km off shore at Yorkeys Knob and use tenders (catamarans) to get passengers ashore. In 2016, a total of 64 ships visited Cairns. 40 of these used the CCLT and 24 utilised Yorkeys Knob. These numbers were a significant increase over the 2015 figures of 20 and 15 respectively. More significant growth again is currently forecast for Cairns in 2017 with 80 ships in total (Cairns/Yorkeys Knob) (excluding adventure class[18]) scheduled as at 6 September 2016, compared to the current combined total of 64[19].In the case of the Cruise Terminal the 2015 number had remained fairly constant since 2010, with arrivals increasing more at Yorkeys Knob than the CCLT over this period of time.

It is noted from the *Demand Update* (AEC, 2016) that significant growth in ship arrivals is possible under the existing port infrastructure. This has been occurring over the last two years. Residents in the vicinity of the project area may have noticed changes in their environment as a result of the growth in shipping arrivals. Under the recalibrated project, ship arrivals at the CCLT are projected to increase to 129 by 2021, 148 by 2026 and 152 in 2031. This is a threefold increase in arrivals over the next five years.

Further incremental increases in localised environmental impacts could be experienced by permanent residents/tourists as a result of landside construction, the dredging works, and particularly the increase in shipping arrivals associated with the proposed project. Assessment has found the following:

- Noise: The Noise Assessment (Ask, 2017) found that noise emissions from wharf operations may result in minor exceedances of night-time acoustic objectives within nearby units, with windows and doors closed. However, the exceedance was considered acceptable on the basis that noise levels are not increasing in magnitude, only frequency of occurrence, and that there are no historical complaints from existing noise levels. Noise emissions from wharf construction activities were found to be acceptable if occurring during standard construction hours.
- Traffic: People who currently live or work in close proximity to the CCLT could experience an increase in vehicle/pedestrian traffic when a cruise ship is docked at the terminal. Such congestion would occur more frequently and could worsen as the number and size of ships able to berth at the terminal increase. The Transport Assessment ((Chapter B14, revised Draft EIS) found that construction works associated with the wharf redevelopment for the Cairns Cruise Liner Terminal would have negligible impacts on the external

[18] Carrying less than 150 people

[19] *Demand Update* (AEC, 2016)

transport network. It also found that the operations of the CCLT would have negligible impacts on the external transport network. However some refinement of internal facilities and management associated with pedestrian and bus/taxi provisions are recommended to improve safety and functionality at the terminal. This may reduce any local congestion experienced by residents or workers in the area.

- Air Quality: The Air Quality Assessment (Ask, 2017) found that exceedances of criteria predicted due to the wharf construction activities are likely due to the conservatism of the model and can be mitigated. The use of fuel oil by cruise ships when berthed at the wharf is predicted to cause exceedances of two criteria in both the 2028 baseline scenario and the 2028 project scenario, however as the International Maritime Organisation (IMO) has mandated the use of low sulfur fuels and or exhaust scrubbers by international shipping after 1st January 2020, which will be adopted by Australian authorities, criterion compliance is expected. The criterion would be met if marine diesel was used at berth, and this is therefore recommended as a mitigation measure. Dust deposition levels from shipping are predicted to be under the nuisance criterion but deposition of diesel soot may accumulate over time and be observable due its dark colour, however the IMO regulations will result in low soot emissions by cruise ships after 2020. It is noted that the Cruising industry is already fitting exhaust scrubbers to new ships and retrofitting current ships expected to be operating after 2020. The use of diesel by the backhoe dredge and associated barge will prevent potential criterion exceedances when operating near the wharf area.

  In summary, there was found to be low risk to air quality associated with the project provided the recommendations for mitigation were implemented.

- Visual Impacts: Visual impacts associated with the operation of the project have been assessed by Cardno (2017). Visual impacts were identified as likely to be short-term (dredging and landside construction) or transient (larger ships).

  Only minor visual intrusion from barge movements associated with moving material to the Tingira Street DMPA was identified as likely, and these would be temporary only. Where feasible, construction plant, materials and machinery would be screened behind fencing or located to minimise visual impacts. Lighting of compounds and works sites would be restricted to agreed hours and in accordance with a Construction Environmental Management Plan. Directed lighting would be used at the wharf construction site to minimise glare and light spill. Regular maintenance of site hoarding and perimeter site areas would be undertaken, including the prompt removal of graffiti. The management of dredging activities themselves would minimise the potential for visual intrusion from dredging operations and dredge plumes.

  The main long-term outcome of the CSD project, in terms of visible changes within the viewshed, was assessed as likely to be an increase in the number and size of cruise ships. The largest cruise ship which currently visits Cairns regularly is the approximate equivalent of 16 storeys high above the waterline, whereas in future (after channel deepening) the largest vessel will be the height equivalent of a 20 storey hotel (approximately). It is also significant that the number of large cruise ships visiting Cairns is likely to increase by an average of 5 - 10% additional trips per year to 2026. The *Visual and Landscape Assessment* (Cardno, 2017) considered the likely change in the perceived character of Trinity Bay for people living in the high-rise apartments would be negligible. Additional light glow from wharf and shipping activities was also considered to be negligible.

It is clear from Council planning documents that this area is expected to develop as an active and vibrant part of the city centre with a 24-hour economy. Consistent with this, there was found to be a relatively low proportion of children, relatively high proportions of some young adult age groups, and also significantly higher proportions of 45 to 54 year olds and 60 to 74 year olds. The latter would be expected to be empty nesters seeking a city lifestyle and in some cases, good water views. This is confirmed by the demographic profile of the Wharf St Sub-Area, which had a high proportion of couple families without children, lone person households and group households, compared to the Cairns LGA and Queensland.

These residents have chosen a location which is active and vibrant, and the expectation of a quiet residential environment would be unrealistic. It is also clear from Council's planning documents that despite the fact that residential development is encouraged, development should not affect the operational aspects of the Port of Cairns.

The *Port of Cairns Land Use Plan* (Ports North 2013) envisages ongoing development of the Port. As discussed in Section 2.1.3.3., Ports North prepares land use plans for strategic port land under its control which are approved by the State Government Minister of Transport. The land use plan aims to encourage sustainable expansion of port holdings, facilitate the integration of port interests with State and local government interests, provide a basis for assessing development applications, and provide government, residents and businesses with confidence about future development on port held land.

The project is one of the major last stages of development in the Cityport which has seen a significant revitalisation and increased connection of the esplanade, lagoon and foreshore to the operating port area including the upgraded CCLT. This process has seen a steady increase in the number of tourists and economic benefit from restaurant and tourist accommodation through these areas of the Cairns LGA.

It is felt that many younger residents, especially in group households, are unlikely to be affected by the above potential impacts of the proposed development. However many of the residents of the Wharf Street Area are mature aged. The median age is 48 years of age for the Wharf Street Sub-Area, substantially higher than the median age for the Cairns LGA and for Queensland, both at 36 years. Median incomes in the Wharf Street Sub Area were substantially higher than for Cairns LGA and Queensland. It could be expected that some of these residents have chosen to live in this location to achieve a lifestyle and may feel upset and disturbed by the changes that are occurring. They may also be concerned about impacts to property values.

While it may have been difficult to envisage the increases in the popularity of cruising which have led to the extent of likely shipping arrivals, an overriding consideration is that these residents have bought or chosen to live opposite a shipping terminal and a working port. The landside construction and dredging works would be temporary and reversible, and it is considered that the social impacts arising from these would be minor. The impacts arising from operation of the terminal would be direct, adverse, long-term and irreversible. Their social impact is considered moderate.

The *Cityport Local Area Plan* (Ports North, 2006, amended March 2013), in achieving its vision, states that it will balance economic, social and environment factors in decision making to minimise adverse impacts on the community and environment. It is consequently considered that predicted environmental impacts on residents, particularly those relating to noise and air quality, should be mitigated as far as possible by available practicable measures.

On the other hand, the proposal is expected to further enliven and activate the public domain in the vicinity of the Cruise Liner Terminal and the Cityport area as a whole. This is considered a beneficial social impact for members of the community and visitors, increasing public safety and the use of a unique Cairns precinct.

4.1.3.2 Impacts on Yorkeys Knob

Effect of Change in Ship Arrivals in Yorkeys Knob

The number of ship arrivals at Yorkeys Knob has increased over the years, from 15 in 2010, to 24 in 2016, and further growth is scheduled in 2017.

Under the recalibrated project, shipping arrivals at Yorkeys Knob are estimated to decrease from 24 in 2016 to 13 by 2021. By 2026 it will remain similar (16). However by 2031, the number of ships will again have increased to 31, exceeding the current number of arrivals.

This decrease in shipping numbers at Yorkeys Knob will have various impacts on different groups of stakeholders.

Businesses and tourism operators in Yorkeys Knob

The people of Cairns are said to be used to 'ship days' and the local economy is geared to meeting the needs of visiting cruise passengers by offering relevant tour options (type, duration and quantity of offerings) and putting on additional staff in retail and hospitality offerings to meet additional demand for services. Similarly, business

and tourism operators are well aware of ship arrival dates in Yorkeys Knob, and have organised procedures to collect tourists etc. from this location once disembarked from the ship and transported to shore.

Arrangements in Yorkeys Knob have been well acknowledged as not ideal. In 2013, a Working Group was established by the Minister for Transport and Main Roads with members from key stakeholder groups from tourism, cruise shipping and marine and transport logistics and operations to identify improvements that needed to be made in response to unfavourable passenger feedback on both the facilities and the shore based welcome. This was felt to reflect poorly on the reputation of Cairns and the region amongst cruise companies and cruise passengers (Ports North, 2013a).

Land-based infrastructure improvements which were subsequently made included six dedicated tour coach loading bays in a herringbone design, a separate transit coach loading location and increased passenger congregation and movement area. The additional passenger congregation zones provided opportunities to address the other issues including orderly passenger movement and additional space for seats, shelter, markets, photos and tour information.

Marine based infrastructure improvements included reuse of the existing pontoon, re-arranging the deck equipment to improve the passenger ferry interfaces, construction of three 'L' shaped gangways for common use by ferry operators, the purchasing of new floating fenders to create additional space at the gangway exit points, increasing the width of the gangway from the pontoon to the shore and increasing the pontoon length by 3m.

These improvements are reported to have significantly improved arrangements for transfer of passengers at Yorkeys Knob. Tourism operators have also pointed out that it limits the amount of time passengers are able to utilise seeing attractions and travelling around the region. These operators are equally, and indeed more readily able to operate their services from the CCLT. A higher number of passengers may result, and longer and more tours are likely to be able to be booked.

There are relatively few local businesses in Yorkeys Knob, with the exception of a small local neighbourhood shopping centre. It is considered unlikely that these would currently benefit from ship arrivals at Yorkeys Knob. Some local tourist attractions have developed which offer half day quad bike and horse riding tours for passengers. Early booking of these is recommended, however there may be a minor impact on walk-in businesses in the short-medium term. In the long-term, the overall number of ship arrivals will again increase and these businesses are likely to be able to offer their services to more passengers. The social impact on these businesses is considered minor and reversible.

The social impacts arising in the short-medium term of a decrease in ship arrivals at Yorkeys Knob is therefore considered beneficial to tourism operators. In the long-term, the overall number of ship arrivals will again increase and tourism operators will be able to add increased services to cover the additional demand. Again the social impact on operators is likely to be beneficial.

Members of the Yorkeys Knob community and tourists

Yorkeys Knob is a relatively quiet seaside suburb, with the Yorkeys Knob Boating Club being a major feature. Residential housing is interspersed with medium scale tourism development. The Yorkeys Knob community tends to be an older community with low proportions of children and a high proportion of lone person households.

While the tender landing facilities are relatively segregated from most residential uses, it is understood that there is considerable traffic and parking congestion on a 'ship day', and the quiet nature of the suburb is likely to be somewhat disturbed. The entry road is also likely to be heavily used by buses and other vehicles. This could create issues for some people, including older residents, to move around on those days.

It is also understood that on 'ship days' there are constraints to the use of the public boat ramp at Yorkeys Knob Boat Club and some inconvenience to members of the local community and tourists staying at Yorkeys Knob or nearby areas who intended to go boating or fish.

The short-medium term reduction in ship arrivals will alleviate this congestion and disturbance. It will however re-occur in the longer term (by 2031) when ship arrivals will be increased over those in 2016.

The social impact arising in the short-medium term of a decrease in ship arrivals at Yorkeys Knob is therefore considered beneficial to the community. In the long-term, the overall number of ship arrivals will again increase and this congestion is likely to re-occur. While this benefit will reverse over time, this is not seen as a consequence of the proposal, but rather a long-term increase in the number of passengers wishing to visit the region.

Yorkeys Knob Boating Club Inc.

Yorkeys Knob Boating Club Inc. currently benefits from ship arrivals through cruise ship passenger visitation to the club and restaurant facilities, and charges associated with the pontoon access hire. It is noted that the changes in procedures, combined with the upgrades in infrastructure, added costs to the operations at the Club. Passengers are also understood to use the club's toilet amenities, and the club needs to ensure that it is open at these times.

The pontoon access hire is a source of income to the club, which may also make an economic gain from use of the club by a small number of passengers. This income will be reduced by a decreased number of ship arrivals in the short-medium term and this is considered to be a minor adverse social impact. This loss of income will be gradually reversed over time as the number of ship arrivals increases and exceeds the existing number. This will be a beneficial social impact over time, however it is not seen as a consequence of the proposal, but rather a long-term increase in the number of passengers wishing to visit the region.

Ship Passengers and Crew

Despite improvements to the infrastructure at Yorkeys North, transfer by tender is still likely to be considered unsatisfactory from the point of view of some passengers on board ship, who may choose not to go ashore because of sea, weather or other conditions. These conditions can create difficulties for crew and possible safety issues, for example when dealing with elderly passengers. The current arrangements are also not ideal in terms of the amount of time passengers are able to utilise seeing attractions and travelling around the region. It is probably fair to say that arrival at Yorkeys Knob also does not have the destination appeal of berthing in the city of Cairns.

The ability of an increased number of ships to berth at CCLT rather than Yorkeys Knob will clearly be advantageous to passengers, crew and cruise lines. The social impact arising in the short-medium term of a decrease in ship arrivals at Yorkeys Knob is therefore considered beneficial. While this benefit will reverse over time, this is not seen as a consequence of the proposal, but rather a long-term increase in the number of passengers wishing to visit the region.

4.2 Likelihood of Impact and Risk Rating

The next stage of the assessment has been to:

- assess the likelihood of an impact occurring
- assess the likely risk of an impact occurring by using a risk matrix.

Risk is determined as the product of significance versus likelihood. **Table 24** outlines the risk probability categories that have been used; and **Table 25** provides the risk matrix used. **Table 26** outlines the risk rating legend (from extreme risk to negligible risk).

Table 24. Likelihood of impact

Likelihood of Impacts	Risk Probability Categories
Highly Unlikely	Highly unlikely to occur but theoretically possible
Unlikely	May occur during construction of the project but probability well below 50%; unlikely, but not negligible

Possible	Less likely than not but still appreciable; probability of about 50%
Likely	Likely to occur during construction or during a 12 month timeframe; probability greater than 50%
Almost Certain	Very likely to occur as a result of the proposed project construction and/or operations; could occur multiple times during relevant impacting period

Table 25. Risk matrix

Likelihood	Significance					
	Beneficial	Negligible	Minor	Moderate	High	Very high
Highly Unlikely/ Rare	Negligible Positive	Negligible	Negligible	Low	Medium	High
Unlikely	Low Positive	Negligible	Low	Low	Medium	High
Possible	Moderate Positive	Negligible	Low	Medium	Medium	High
Likely	High Positive	Negligible	Medium	Medium	High	Extreme
Almost Certain	Extremely Positive	Low	Medium	High	Extreme	Extreme

Table 26. Risk rating legend

Extreme Risk	An issue requiring change in project scope
High Risk	An issue requiring further detailed investigation and planning to manage and reduce risk
Medium Risk	An issue requiring project specific controls and procedures to manage
Low Risk	Manageable by standard mitigation and similar operating procedures
Negligible Risk	No additional management required

The outcomes of this analysis are summarised in **Table 27** during construction and on operation of the CSD Project.

Table 27. Impact assessment table

Primary Impacting Processes	Initial Assessment with Standard (Statutory) Mitigation Measures in Place			Residual Assessment with Additional (Proposed) Mitigation in Place		
	Significance of Impact	Likelihood of Impact	Risk Rating	Significance of Impact	Likelihood of Impact	Risk Rating
Construction						
BARRON DELTA (NORTHERN SANDS) DMPA						
Establishment of	Minor	Almost	Medium	Minor	Likely	Medium

Primary Impacting Processes	Initial Assessment with Standard (Statutory) Mitigation Measures in Place			Residual Assessment with Additional (Proposed) Mitigation in Place		
	Significance of Impact	Likelihood of Impact	Risk Rating	Significance of Impact	Likelihood of Impact	Risk Rating
pipeline and laydown area changing character of the coastal area		certain				
Establishment of pipeline and land-based laydown areas affecting rural character	Negligible	Unlikely	Negligible	Negligible	Unlikely	Negligible
Establishment of pipeline affecting amenity of local residents (traffic, noise, visual impacts and lighting)	Negligible	Possible	Negligible	Negligible	Unlikely	Negligible
Establishment of pipeline affecting amenity of users of the DMPA and surrounding land users	Negligible	Highly Unlikely	Negligible	Negligible	Highly Unlikely	Negligible
Establishment of pipeline affecting amenity of students and staff at Holloways Beach Environmental Education Centre	Negligible	Possible	Negligible	Negligible	Unlikely	Negligible
Establishment of pipeline affecting amenity of residents in nearby suburbs	Negligible	Possible	Negligible	Negligible	Unlikely	Negligible
Restrictions affecting use of beachfront and creek mouth	Negligible	Possible	Negligible	Negligible	Possible	Negligible
Establishment of pipeline affecting use of Environmental Education Centre	Negligible	Possible	Negligible	Negligible	Unlikely	Negligible
Works threatening safety and wellbeing	Negligible	Possible	Negligible	Negligible	Unlikely	Negligible
Pipeline construction restricting recreational fishing and boating use	Minor	Likely	Medium	Minor	Possible	Low
Pipeline construction decreasing amenity of environment of Richters	Minor	Possible	Low	Minor	Possible	Low

Primary Impacting Processes	Initial Assessment with Standard (Statutory) Mitigation Measures in Place			Residual Assessment with Additional (Proposed) Mitigation in Place		
	Significance of Impact	Likelihood of Impact	Risk Rating	Significance of Impact	Likelihood of Impact	Risk Rating
Creek						
Works conflicting with foreshore improvement programmes	Negligible	Highly Unlikely	Negligible	Negligible	Highly Unlikely	Negligible
Works conflicting with future cycleway routes	Negligible	Highly Unlikely	Negligible	Negligible	Highly Unlikely	Negligible
TINGIRA ST DMPA						
Compatibility of the dredge material placement works with existing character	Minor	Possible	Low	Minor	Possible	Low
Traffic, noise, visual impacts or lighting from dredge material placement works decreasing local amenity	Negligible	Unlikely	Negligible	Negligible	Unlikely	Negligible
Dredge material placement works limiting or affecting usage of neighbouring port/commercial activities (including Maritime College, QPS Water Police etc)	Negligible	Highly Unlikely	Negligible	Negligible	Highly Unlikely	Negligible
Dredge material placement works limiting or affecting usage of the boat ramp and community facilities (including Wooden Boat Association)	Negligible	Unlikely	Negligible	Negligible	Unlikely	Negligible
Dredge material placement works affecting usage of Smiths Creek (e.g. live-aboards)	Negligible	Unlikely	Negligible	Negligible	Unlikely	Negligible
OTHER AREAS						
Effects of land-side construction on amenity of residents in Wharf St area	Minor	Possible	Low	Minor	Unlikely	Low

Operation						
BARRON DELTA (NORTHERN SANDS) DMPA						
Temporary floating pump out facility affecting views from northern beaches	Negligible	Unlikely	Negligible	Negligible	Unlikely	Negligible
Operation of pipeline affecting amenity of local residents (traffic, noise, visual impacts and lighting)	Negligible	Possible	Negligible	Negligible	Unlikely	Negligible
Operation of pipeline affecting amenity of users of the DMPA and surrounding land users	Negligible	Highly Unlikely	Negligible	Negligible	Highly Unlikely	Negligible
Operation of pipeline affecting amenity of students and staff at Holloways Beach Environmental Education Centre	Negligible	Unlikely	Negligible	Negligible	Highly Unlikely	Negligible
Operation of pipeline affecting amenity of residents in nearby suburbs	Negligible	Possible	Negligible	Negligible	Unlikely	Negligible
Restrictions affecting use of beachfront and creek mouth	Negligible	Possible	Negligible	Negligible	Possible	Negligible
Operation of pipeline affecting use of Environmental Education Centre	Negligible	Possible	Negligible	Negligible	Unlikely	Negligible
Pipeline on operation threatening safety and wellbeing	Negligible	Unlikely	Negligible	Negligible	Unlikely	Negligible
Pipeline on operation restricting recreational fishing and boating use	Negligible	Highly Unlikely	Negligible	Negligible	Highly Unlikely	Negligible
Pipeline on operation decreasing amenity of environment of Richters Creek	Minor	Possible	Low	Minor	Possible	Low
Pipeline on operation conflicting with foreshore improvement programmes	Negligible	Highly Unlikely	Negligible	Negligible	Highly Unlikely	Negligible

Economic benefit to landowner of DMPA	Beneficial	Almost Certain	Extremely Positive	Beneficial	Almost Certain	Extremely Positive
TINGIRA ST DMPA						
Compatibility of the filled site with existing character	Beneficial	Almost Certain	Extremely Positive	Beneficial	Almost Certain	Extremely Positive
OTHER AREAS						
Increased number of ship arrivals affecting the amenity of residents in the Wharf St area	Moderate	Likely	Medium	Minor/ Moderate	Unlikely	Low
Decreased number of ship arrivals in Yorkeys Knob in short term affecting business and tourism operators	Minor	Almost Certain	Medium	Minor	Almost Certain	Medium
Increased number of ship arrivals in Yorkeys Knob in long term affecting business and tourism operators and Boat Club	Beneficial	Almost Certain	Extremely Positive	Beneficial	Almost Certain	Extremely Positive
Decreased number of ship arrivals in Yorkeys Knob in short term affecting members of the Yorkeys Knob community and tourists	Beneficial	Almost Certain	Extremely Positive	Beneficial	Almost Certain	Extremely Positive
Decreased number of ship arrivals in Yorkeys Knob in short term affecting Boat Club	Minor	Almost Certain	Medium	Minor	Almost Certain	Medium
Decreased number of ship arrivals in Yorkeys Knob in short term affecting ship passengers and crew	Beneficial	Almost Certain	Extremely Positive	Beneficial	Almost Certain	Extremely Positive

5. Mitigation/Enhancement Measures

Social impacts examined in this Technical Study have generally found to be minor, and the mitigation measures inherent in the proposal have been found to be extensive. There are nevertheless some possible opportunities to further mitigate adverse impacts and to enhance some beneficial impacts. These are shown in **Table 28**.

Table 28. Proposed Mitigation/Enhancement Measures

Impact	Proposed Mitigation/Enhancement Measure
Design	
None identified	
Construction	
Impacts on residents in the Wharf Street area of noise, visual and traffic changes during land based wharf upgrade construction works	Predicted temporary environmental impacts on residents, particularly those relating to noise, should be mitigated as far as possible by available practicable measures.
Impact on the character of the coastal area/change in the use of the beachfront/threats to safety and wellbeing from pipeline	Where feasible, construction plant, materials & machinery should be screened behind fencing or located to minimise visual impacts (Cardno, 2017) Appropriate site security, fencing and signage should be utilised to mitigate any threats to public safety and wellbeing from pipeline construction/dismantling and dredging operations.
Impact on users of Richters Creek	Signage and advertising (including mapping) advising of the works affecting the use of Richters Creek and their duration should be provided.
Impacts on Holloways Beach Environmental Education Centre	Pre works consultation should take place with the Holloways Beach Environmental Education Centre to ascertain peak usage times in which works may be able to be amended if required Ongoing liaison should take place with the Holloways Beach Environmental Education Centre to enhance the potential for future involvement of the centre in learning and monitoring opportunities.
Operation and Maintenance	
Impacts on residents in the Wharf Street of Air Quality Changes	Predicted long term environmental impacts on residents, particularly those relating to air quality, should be mitigated as far as possible by available practicable measures and mandated Industry changes to fuel specifications and exhaust scrubbing.
Impact on users of Richters Creek	A 'Submerged Pipeline' sign should be erected on the bank of Richters Creek for the period of the pipeline with depth information to mitigate any potential danger to boat users.

6. Impact Category Summary

The types of impacts are summarised in Table 29 under the following categories:

- adverse/beneficial
- consequential
- cumulative
- short term/long term
- reversible/irreversible
- predictable/unpredictable.

Table 29. Impact category summary

Chapter/ Element	Adverse Impact	Beneficial Impact	Consequential Impact	Cumulative Impact	Short Term	Long Term	Reversible	Irreversible	Predictable	Unpredictable
Construction										
BARRON DELTA (NORTHERN SANDS) DMPA										
Section 4.1.1.1	Establishment of pipeline and laydown area will change the character of the coastal area		None	None	✓		✓		✓	
Section 4.1.1.1	Establishment of pipeline and land-based laydown areas could affect rural character		None	None	✓		✓		✓	
Section 4.1.1.2	Establishment of pipeline could affect the amenity of local residents (traffic, noise, visual impacts and lighting)		None	None	✓		✓		✓	
Section 4.1.1.2	Establishment of pipeline could affect the amenity of users of the DMPA and surrounding land users		None	None	✓		✓		✓	

Chapter/ Element	Adverse Impact	Beneficial Impact	Consequential Impact	Cumulative Impact	Short Term	Long Term	Reversible	Irreversible	Predictable	Unpredictable
Section 4.1.1.2	Establishment of pipeline could affect the amenity of students and staff at Holloways Beach Environmental Education Centre		None	None	✓		✓		✓	
Section 4.1.1.2	Establishment of pipeline could affect the amenity of residents in nearby suburbs		None	None	✓		✓		✓	
Section 4.1.1.3	Restrictions will affect the use of beachfront and creek mouth		None	None	✓		✓		✓	
Section 4.1.1.3	Establishment of pipeline could affect the use of the Environmental Education Centre		None	None	✓		✓		✓	
Section 4.1.1.3	Works could threaten safety and wellbeing		None	None	✓		✓		✓	
Section 4.1.1.3	Pipeline construction will restrict recreational fishing and boating use		None	None	✓		✓		✓	
Section 4.1.1.3	Pipeline construction will decrease the amenity of environment of Richters Creek		None	None	✓		✓		✓	

Chapter/ Element	Adverse Impact	Beneficial Impact	Consequential Impact	Cumulative Impact	Short Term	Long Term	Reversible	Irreversible	Predictable	Unpredictable
Section 4.1.1.4	Works could conflict with foreshore improvement programmes		None	None	✓		✓		✓	
Section 4.1.1.4	Works could conflict with future cycleway routes		None	None	✓		✓		✓	
TINGIRA ST DMPA										
Section 4.1.2.1		Compatibility of the dredge material placement works with existing character	None	None	✓		✓		✓	
Section 4.1.2.2	Traffic, noise, visual impacts or lighting from dredge material placement works could decrease local amenity		None	None	✓		✓			✓
Section 4.1.2.3	Dredge material placement works could limit or affect usage of neighbouring port/ commercial activities (including Maritime College, QPS Water Police etc)		None	None	✓		✓			✓

Chapter/ Element	Adverse Impact	Beneficial Impact	Consequential Impact	Cumulative Impact	Short Term	Long Term	Reversible	Irreversible	Predictable	Unpredictable
Section 4.1.2.3	Dredge material placement works could limit or affect usage of the boat ramp and community facilities (including Wooden Boat Association)		None	None	✓		✓			✓
Section 4.1.2.4	Dredge material placement works could affect usage of Smiths Creek (e.g. live-aboards)		None	None	✓		✓			✓
OTHER AREAS										
Section 4.1.3.1	Land-side construction could temporarily affect the amenity of residents in Wharf St area		None	None	✓		✓			✓
Operation										
BARRON DELTA (NORTHERN SANDS) DMPA										
Section 4.1.1.1	Temporary floating pump out facility could affect views from northern beaches		None	None	✓		✓			✓
Section 4.1.1.2	Operation of pipeline could affect the amenity of local residents (traffic, noise, visual impacts and lighting)		None	None	✓		✓			✓

Chapter/ Element	Adverse Impact	Beneficial Impact	Consequential Impact	Cumulative Impact	Short Term	Long Term	Reversible	Irreversible	Predictable	Unpredictable
Section 4.1.1.1	Operation of pipeline could affect the amenity of users of the DMPA and surrounding land users		None	None	✓		✓			✓
Section 4.1.1.2	Operation of pipeline could affect the amenity of students and staff at Holloways Beach Environmental Education Centre		None	None	✓		✓			✓
Section 4.1.1.2	Operation of pipeline could affect the amenity of residents in nearby suburbs		None	None	✓		✓			✓
Section 4.1.1.3	Restrictions will affect use of beachfront and creek mouth		None	None	✓		✓		✓	
Section 4.1.1.3	Operation of pipeline could affect the use of Environmental Education Centre		None	None	✓		✓			✓
Section 4.1.1.3	Pipeline on operation will threaten safety and wellbeing		None	None	✓		✓		✓	

Chapter/ Element	Adverse Impact	Beneficial Impact	Consequential Impact	Cumulative Impact	Short Term	Long Term	Reversible	Irreversible	Predictable	Unpredictable
Section 4.1.1.3	Pipeline on operation could restrict recreational fishing and boating use		None	None	✓		✓			✓
Section 4.1.1.3	Pipeline on operation will decrease the amenity of environment of Richters Creek		None	None	✓		✓		✓	
Section 4.1.1.4	Pipeline on operation could conflict with foreshore improvement programmes		None	None	✓		✓		✓	
Section 4.1.1.5	Economic benefit will accrue to landowner of DMPA		None	None	✓		✓		✓	
TINGIRA ST DMPA										
Section 4.1.2.1		Compatibility of the filled site with existing character	Provision of additional port industrial land	None		✓		✓	✓	
OTHER AREAS										
Section 4.1.3.2	Increased number of ship arrivals could affect the amenity of residents in the Wharf St area		None	None		✓		✓		✓

Chapter/ Element	Adverse Impact	Beneficial Impact	Consequential Impact	Cumulative Impact	Short Term	Long Term	Reversible	Irreversible	Predictable	Unpredictable
Section 4.1.3.2	Decreased number of ship arrivals in Yorkeys Knob in short term affecting business and tourism operators		None	None	✓		✓		✓	
Section 4.1.3.2		Increased number of ship arrivals in Yorkeys Knob in long term affecting business and tourism operators and Boat Club	None	None		✓		✓	✓	
Section 4.1.3.2		Decreased number of ship arrivals in Yorkeys Knob in short term affecting members of the Yorkeys Knob community and tourists	None	None	✓		✓		✓	
Section 4.1.3.2	Decreased number of ship arrivals in Yorkeys Knob in short term affecting Boat Club		None	None	✓		✓		✓	
Section 4.1.3.2		Decreased number of ship arrivals in Yorkeys Knob in short term affecting ship passengers and crew	None	None	✓		✓		✓	

7. Conclusion

The social policy framework in which the Technical Study was undertaken is one of overwhelming support for the development of the cruise shipping market and home porting of cruise vessels. Documents reviewed that referred directly to the CSD Project expressed support for the expansion of opportunities, and the importance of the employment and tourism stimulus that it would provide for the region. In particular, the FNQRP highlights the Port of Cairns as a key node for the development of tourism in the region. The Great Barrier Reef is noted as an important tourism draw-card for the region, and supporting cruise and other maritime infrastructure is noted as an action in many plans and strategies.

At a local level, the need to balance values relating to the natural environment whilst providing local long-term employment opportunities was however recognised, including the sustainability of built infrastructure and the conservation of world heritage features and natural and cultural resources. It was also recognised as important that rural land was protected and used for rural purposes, and that both tourism and primary production remain substantial economic drivers and employers.

The project concept was found to have many mitigation measures inherent in the proposal. Compared to the economic and social benefit of the project to the EIS Study Area, the adverse social impacts identified in this Technical Study have generally been found to be negligible or minor. The majority are temporary in nature. There was only one impact that was identified as potentially moderate. Several beneficial impacts were also identified by this Technical Study. There are possible opportunities to further mitigate some adverse impacts and to enhance some beneficial impacts.

From a social perspective, there are no concerns which would warrant the project not proceeding.

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