FLANAGAN CONSULTING GROUP
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Ports North

# CAIRNS SHIPPING DEVELOPMENT PROJECT

# Revised Draft Environmental Impact Statement

## Chapter B19: EPBC Act Issues

# TABLE OF CONTENTS


**CHAPTER B19: EPBC ACT ISSUES_____ I**

B19.1 Introduction ..... 1
*B19.1.1 Overview ..... 1*
*B19.1.2 Referral and Allied Details ..... 1*
*B19.1.3 Study Area and Project Areas ..... 2*
*B19.1.4 Matters of National Environmental Significance ..... 5*
B19.2 Legislation and Policy Background ..... 13
*B19.2.1 Objects of the EPBC Act ..... 13*
*B19.2.2 EPBC Act Regulations ..... 14*
*B19.2.3 EPBC Act Offsets Policy ..... 14*
*B19.2.4 Environmentally Sustainable Development ..... 15*
B19.3 Project Overview ..... 19
*B19.3.1 Introduction ..... 19*
*B19.3.2 Project Elements ..... 19*
*B19.3.3 Assumed End Use of DMPAs ..... 19*
*B19.3.4 Environmental Management ..... 21*
B19.4 Overview of Study Area ..... 22
*B19.4.1 Marine Areas ..... 22*
*B19.4.2 Terrestrial Areas ..... 23*
*B19.4.3 Reliability of Information ..... 31*
B19.5 Impact Assessment Framework ..... 32
*B19.5.1 Introduction ..... 32*
*B19.5.2 Strategic Assessment of the GBR Region ..... 32*
*B19.5.3 Types of Impacts ..... 33*
*B19.5.4 Impact Screening ..... 34*
*B19.5.5 EIS Impact Assessment Methodology ..... 36*
B19.6 World Heritage Properties - GBR ..... 40
*B19.6.1 Presence of Matter ..... 40*
*B19.6.2 Summary of Residual Risk ..... 49*
*B19.6.3 Consistency with International Obligations etc. ..... 53*
B19.7 World Heritage Places –Wet Tropics ..... 54
*B19.7.1 Presence of Matter ..... 54*
*B19.7.2 Summary of Residual Risk ..... 54*
*B19.7.3 Consistency with International Obligations etc. ..... 54*
B19.8 National Heritage Places – Great Barrier Reef ..... 55
*B19.8.1 Presence of Matter ..... 55*
*B19.8.2 Summary of Residual Risk ..... 55*
*B19.8.3 Consistency with International Obligations etc. ..... 55*
B19.9 National Heritage Places – Wet Tropics of Queensland ..... 56
*B19.9.1 Presence of Matter ..... 56*
*B19.9.2 Summary of Residual Risk ..... 56*
*B19.9.3 Consistency with International Obligations etc. ..... 56*

B19.10 National Heritage Places – WTWHA (Indigenous Values) ..... 57
*B19.10.1 Presence of Matter* ..... *57*
*B19.10.2 Summary of Residual Risk* ..... *57*
*B19.10.3 Consistency with International Obligations etc.* ..... *57*
B19.11 Listed Threatened Flora Species ..... 58
*B19.11.1 Presence of Matter* ..... *58*
*B19.11.2 Summary of Residual Risk* ..... *58*
*B19.11.3 Consistency with International Obligations etc.* ..... *59*
B19.12 Listed Threatened Terrestrial Fauna Species ..... 60
*B19.12.1 Presence of Matter* ..... *60*
*B19.12.2 Summary of Residual Risk* ..... *60*
*B19.12.3 Consistency with International Obligations etc.* ..... *61*
B19.13 Listed Threatened and Migratory Marine Species ..... 62
*B19.13.1 Presence of Matter* ..... *62*
*B19.13.2 Summary of Residual Risk* ..... *62*
*B19.13.3 Consistency with International Obligations etc.* ..... *63*
B19.14 Listed Threatened Communities ..... 64
*B19.14.1 Presence of Matter* ..... *64*
*B19.14.2 Summary of Residual Risk* ..... *65*
*B19.14.3 Consistency with International Obligations etc.* ..... *65*
B19.15 Listed Terrestrial Migratory Species ..... 66
*B19.15.1 Presence of Matter* ..... *66*
*B19.15.2 Summary of Residual Risk* ..... *66*
*B19.15.3 Consistency with International Obligations etc.* ..... *67*
B19.16 Commonwealth Marine Areas ..... 69
*B19.16.1 Presence of Matter* ..... *69*
*B19.16.2 Summary of Residual Risk* ..... *69*
*B19.16.3 Consistency with International Obligations etc.* ..... *69*
B19.17 Great Barrier Reef Marine Park ..... 70
*B19.17.1 Presence of Matter* ..... *70*
*B19.17.2 Summary of Residual Risk* ..... *73*
*B19.17.3 Consistency with International Obligations etc.* ..... *74*
B19.18 Commonwealth Land ..... 74
*B19.18.1 Presence of Matter* ..... *74*
*B19.18.2 Summary of Residual Risk* ..... *76*
*B19.18.3 Consistency with International Obligations etc.* ..... *76*
B19.19 Cumulative and Consequential Impacts ..... 77
*B19.19.1 Cumulative Impacts* ..... *77*
*B19.19.2 Consequential Impacts* ..... *77*
B19.20 Summary ..... 78
*B19.20.1 Summary of Residual Impacts on MNES* ..... *78*
*B19.20.2 Summary Against the Objects of the EPBC Act* ..... *78*
B19.21 Allied Matters ..... 89
*B19.21.1 Cost of Mitigation Measures* ..... *89*
*B19.21.2 Offsets* ..... *89*
*B19.21.3 Monitoring* ..... *90*

B19.22 Relevant Reports and Plans ..... 91
*B19.22.1 Background* ..... *91*
*B19.22.2 Review of Relevant Strategic Documents* ..... *91*
B19.23 Dealing with Uncertainty ..... 101
B19.24 References ..... 103

## List of Figures

Figure B19-1 Whole of WHA, Regional and Local Scales. ..... 3
Figure B19-2 Study Area and Project Areas. ..... 4
Figure B19-3 EPBC Act Protected Matters search area. ..... 5
Figure B19-4 Location of mappable matters of NES. ..... 7
Figure B19-5 Spatial extent of the matters of NES for the Great Barrier Reef Region. ..... 9
Figure B19-6 Local boundaries of the GBR region, the GBRWHA, and the GBRMP. ..... 10
Figure B19-7 Landside Works Project Area showing mapped natural vegetation. ..... 24
Figure B19-8 Northern Sands DMPA. ..... 26
Figure B19-9 Northern Sands DMPA and pipelines. ..... 28
Figure B19-10 Tingira Street DMPA. ..... 30
Figure B19-11 GBRWHA in the vicinity of the Northern Sands Project Area. ..... 41
Figure B19-12 GBRWHA in the vicinity of the Tingira Street Project Area. ..... 42
Figure B19-13 Location of listed threatened ecological communities. ..... 64
Figure B19-14 Great Barrier Reef Marine Park – Zoning Map. ..... 72
Figure B19-15 Commonwealth Land. ..... 75
Figure B19-16 Relationship of the North-East Shipping Plan to other plans and strategies ..... 93
Figure B19-17 Summary of findings from the Great Barrier Reef Outlook Report 2014. ..... 95
Figure B19-18 Protecting the Outstanding Universal Value of the Great Barrier Reef World Heritage Area ..... 98

## List of Tables

Table B19-1 Relevant controlling provisions ..... 6
Table B19-2 Spatial Assessment ..... 8
Table B19-3 Differences between the GBR World Heritage Area, GBR Region and GBR Marine Park ..... 11
Table B19-4 Cross reference to other Revised Draft EIS Chapters ..... 11
Table B19-5 Ports North referral history ..... 18
Table B19-6 Documents describing project management measures and mitigation ..... 21
Table B19-7 Key references to GBRMPA (2014A and 2014B) ..... 33
Table B19-8 Cumulative impacts for assessment ..... 35
Table B19-9 Impact consequence Criteria ..... 37
Table B19-10 Classifications of the duration of identified impacts ..... 38
Table B19-11 Likelihood of Impact ..... 38
Table B19-12 Risk Matrix ..... 38
Table B19-13 Risk Rating Legend ..... 39
Table B19-14 Comparison of original and current World Heritage criteria ..... 44
Table B19-15 Key WHA values and attributes at GBR and site level ..... 46
Table B19-16 Key WHA Environmental processes at GBR and site level ..... 48
Table B19-17 Summary of residual risk on GBRWHA – OUV ..... 50
Table B19-18 Summary of residual risk on GBRWHA – INTEGRITY ..... 52
Table B19-19 Summary of Impacts on threatened, migratory and listed marine species ..... 62
Table B19-20 Management Objectives of Marine Park Zones ..... 71
Table B19-21 Assessment of Impacts to GBR Marine Park ..... 73
Table B19-22 Commonwealth Land ..... 76
Table B19-23 Assessment summary table – Matters of National Environmental Significance ..... 79
Table B19-24 Summary against the objects of the EPBC Act ..... 82

## List of Photos

Photo B19-1 *Myrmecodia beccarii* in Melaleuca. ..... 59

# B19.1 Introduction

## B19.1.1 Overview

This chapter provides a summary of matters covered by the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) (EPBC Act) that are relevant to the Cairns Shipping Development Project (CSD Project). The approach taken differs from that documented in the Draft EIS where area-based EPBC Act issues were included in the discussion of nature conservation areas (Chapter B2), along with those covered by the Queensland ToR. Other EPBC Act issues (i.e. species) were described as appropriate elsewhere in the Draft EIS.

Due to the growing complexity of impact assessment under the EPBC Act it was decided to present all information relevant to the controlling provisions as described below in this dedicated chapter. In some cases, the material presented here is unique to this chapter whereas in other cases it is a summary of more detailed work best described elsewhere. An example is listed threatened species under the EPBC Act that are covered detail in the context of **Chapter B7** (Marine Ecology) and **Chapter B8** (Terrestrial Ecology). Refer to **Table B19-4** below for a broad outline of where relevant matters are assessed elsewhere. Similarly, many general matters covered by the EIS guidelines are best dealt with in other chapters. Examples are the project description, the consideration of prudent and feasible alternatives, and the recommended management framework. However, sufficient details are included in this chapter to provide the necessary context for EPBC Act issues.

## B19.1.2 Referral and Allied Details

### B19.1.2.a Referral

The CSD Project (2012/6538) was referred to the then Commonwealth Minister for Sustainability, Environment, Water, Population and Communities (SEWPaC) in 2012 to determine whether it is a 'controlled action' under the EPBC Act.

### B19.1.2.b Ministerial Decision

The ministerial decision notice dated 4 October 2012 stated that the project is a controlled action and will require assessment and approval under the EPBC Act before it can proceed. The relevant controlling provisions (Matters of National Environmental Significance – variously referred to as 'matters of NES' and 'MNES') and their section references under the EPBC Act are:

- World Heritage properties (sections 12 & 15A)
- National Heritage places (sections 15B & 15C)
- Listed threatened species and communities (sections 18 & 18A)
- Listed migratory species (sections 20 & 20A)
- Commonwealth marine areas (sections 23 & 24A)
- Great Barrier Reef Marine Park (sections 24B & 24C)
- Commonwealth land (sections 26 & 27 A).

### B19.1.2.c EIS Guidelines

On 21 March 2013, the Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) (now Department of the Environment and Energy (DoEE)) issued the final EIS Guidelines for the project. A copy of these, along with a checklist of where in the overall document each is addressed is included in **Appendix C** of this Revised Draft EIS.

### B19.1.2.d 2016 Update

A meeting was held with officers from DoEE on 15 November 2016 to discuss the recalibrated project and the assessment process. By email dated 13 December 2016, DoEE advised, amongst other things:

> In relation to addressing the EIS Guidelines and MNES, the guidelines require that impacts (against the controlling provisions e.g. threatened species and ecological communities, world heritage etc.) are presented in a clear, objective and succinct manner supported by appropriate plans, maps etc. Should a part of the guidelines be outdated or overtaken by events a statement to that effect could be included in the revised EIS.

DoEE agreed that the EIS guidelines were generally adequate for the recalibrated project. However, it was noted in the above email that:

> Some key documents that have been released since the EIS guidelines were issued and which may need to be considered include, but not necessarily limited to, Reef 2050; GBR Outlook 2014; GBR Biodiversity Conservation Strategy 2013; Referral guidelines for GBR OUV; 2014 GBR strategic assessment; the Reef water quality protection plan; North-East Shipping Management Plan etc.

These documents are referred to where relevant in the detailed discussion on EPBC Act issues and summarised in **Section B19.22**.

## B19.1.3 Study Area and Project Areas

The 'study area' for the EIS varies depending on the issue at hand while the 'project area' is the immediate footprint of the proposed works. For the consideration of EPBC Act issues, the following definitions apply.

The Study Area is shown variously on **Figure B19-1** and **Figure B19-2** and encompasses:

- The whole of WHA scale (not mapped) – this scale can be defined as the Great Barrier Reef World Heritage Area (GBRWHA) including both nearshore and offshore areas as well as the Wet Tropics (of Queensland) World Heritage Area (WTWHA). This scale of assessment is relevant in the context of the project affecting, for example, a key aspect of the Outstanding Universal Value (OUV) of a world heritage property as a whole or otherwise causing impacts that could result in the property no longer meeting its nomination criteria. The concept of OUV is described in **Section B19.6.1.b**.
- The regional scale (**Figure B19-1**):
  - In terms of marine issues, this is defined as being a subset of the Wet Tropics region of the GBRWHA, extending north of Cairns to the Bloomfield River and south to Mission Beach (Dunk Island). This regional classification has been chosen on the basis that the condition of water quality, seagrass, and coral within this region is reported as part of the Great Barrier Reef Report Card 2012/2013 within the 'Reef Water Quality Protection Plan – Marine Results' published by the Australian and Queensland Governments. [GBR Outlook Report 2014 (GBRMPA 2014b)]
  - For terrestrial issues, the regional scale includes areas between the WTWHA and the ocean.
- The local scale (**Figure B19-2**):
  - The township of Cairns.
  - The marine environment including the Trinity Inlet, Trinity Bay and surrounding waters including:
    - all waters of Trinity Bay
    - the tidal waters of Trinity Inlet, including landward areas to the boundary of the Fish Habitat Area
    - Double Island
    - the coastline and nearshore waters of Cairns' Northern Beaches
    - Mission Bay
    - the coastline extending to Cape Grafton.

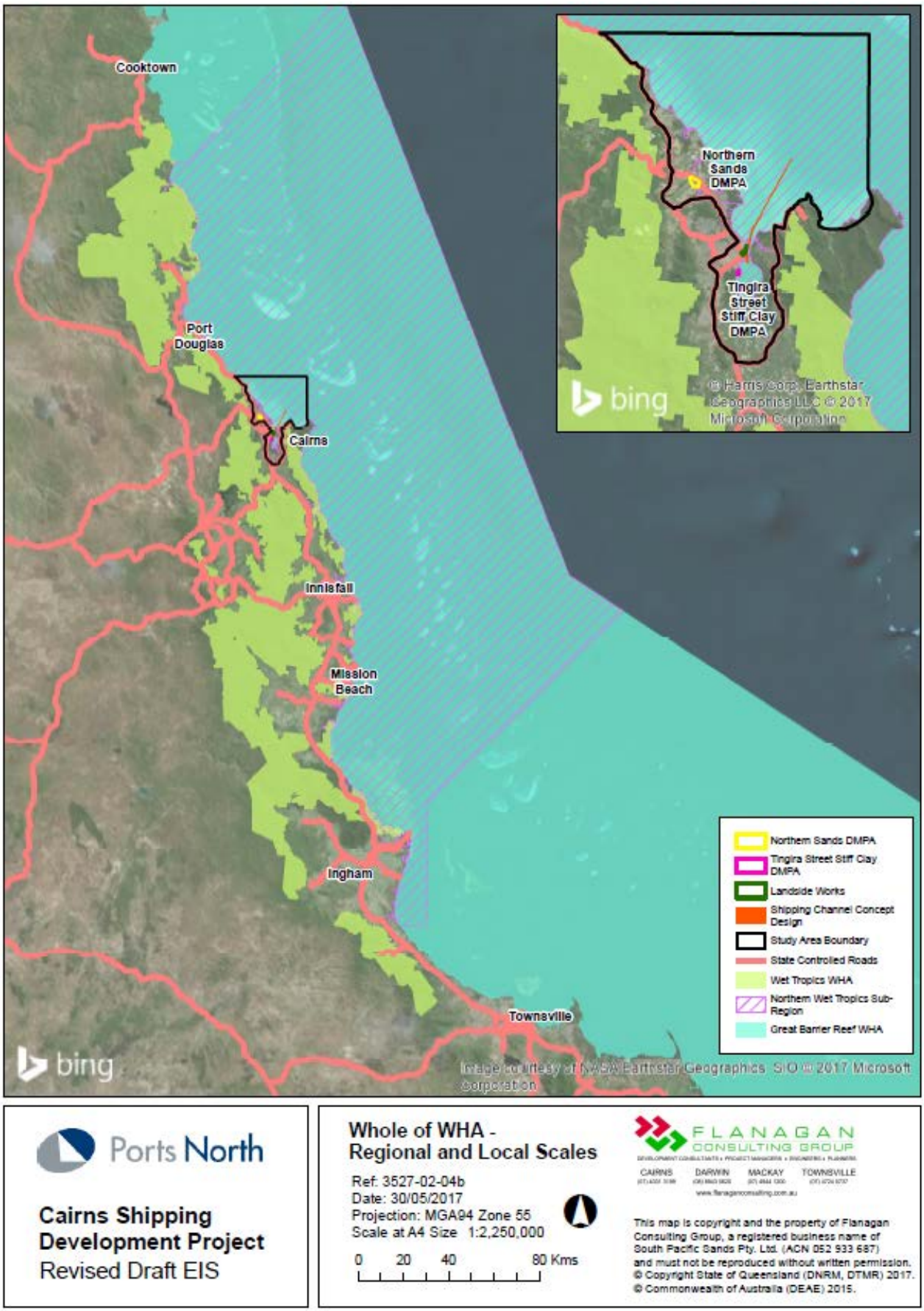



**Figure B19-1** Whole of WHA, Regional and Local Scales.

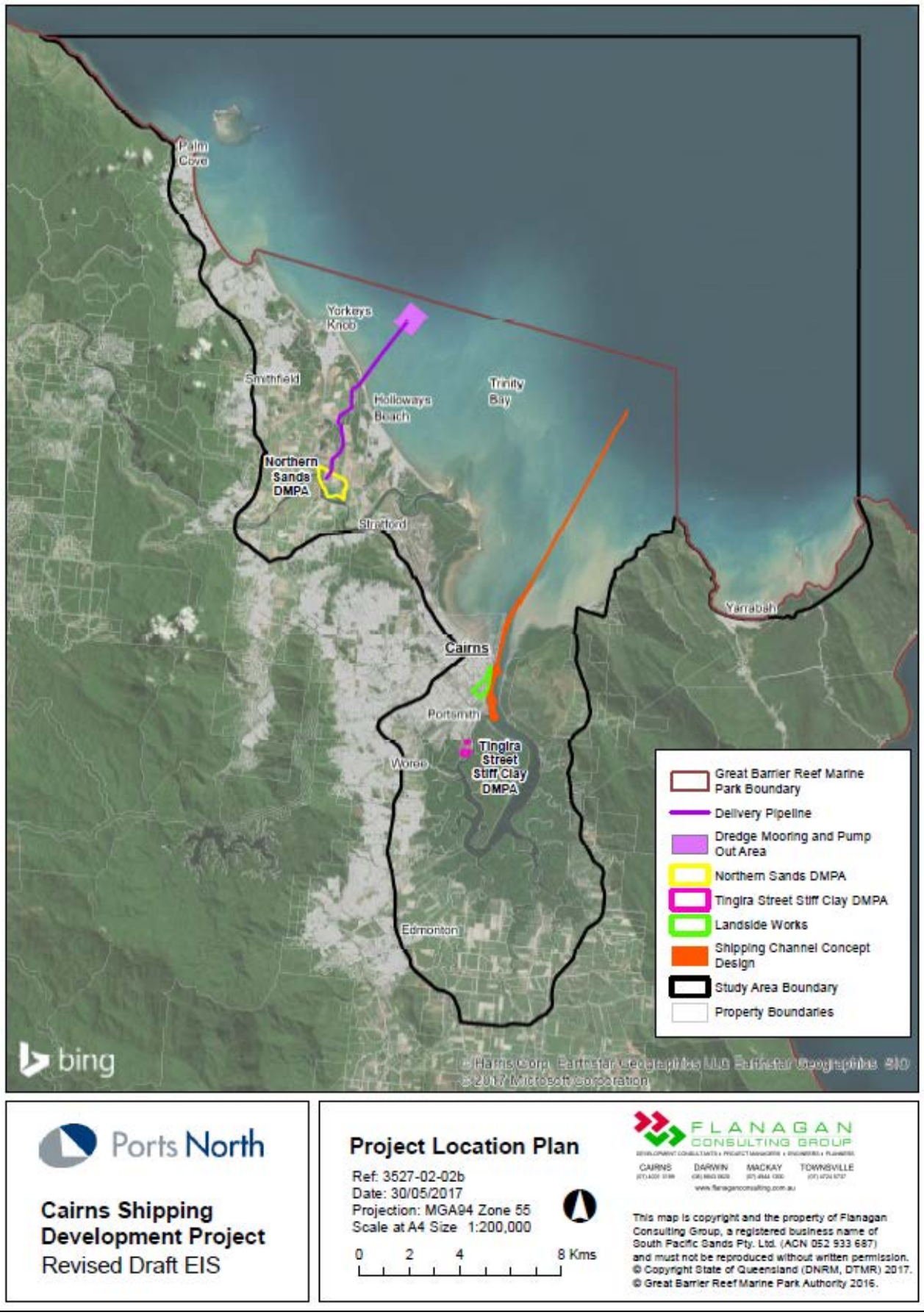



**Figure B19-2** Study Area and Project Areas.

Project areas are also shown on **Figure B19-2** and encompass (see also **Section B19.3**):

- Channel Project Area including the shipping channel, the preferred marine placement area for maintenance material – described as Option 1A Dredge Material Placement Area (DMPA) and the route to the pump out point at the seaward end of the pipeline to the Northern Sands DMPA.
- Land-side Works Project Area for wharf upgrades and berthing of cruise ships.
- Northern Sands Project Area consisting of the DMPA, the inlet pipeline corridor, and the tailwater pipelines corridor.
- Tingira Street Project Area, essentially the Tingira Street Stiff Clay DMPA.

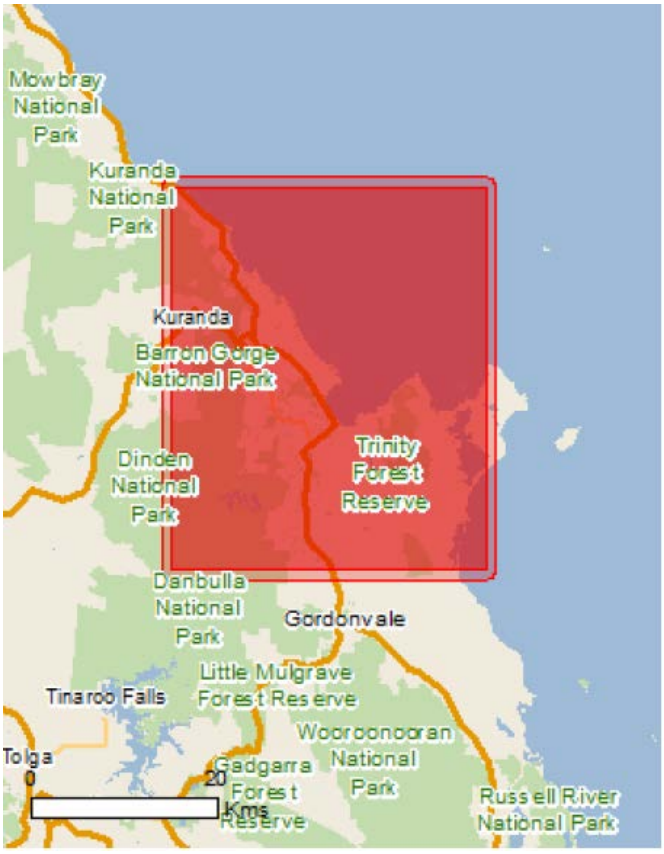
This chapter focuses on potential impacts in EPBC Act issues at all of these scales, noting that further discussion of impacts at regional and whole of WHA scale are outlined in **Chapter B18** (Cumulative Impacts Assessment).

The Channel Project Area is discussed in **Chapter B7** (Marine Ecology) while the Northern Sands Project Area and Tingira Street Project Area are discussed in **Chapter B8** (Terrestrial Ecology). No assessment has been made in this chapter of the Landside Works Project Area as construction and operational activities in this area are confined to existing disturbed areas within the Port of Cairns and are limited in scope and area. Specifically, the Landside Works Project Area does not contain any ecological values.

## B19.1.4 Matters of National Environmental Significance

### B19.1.4.a Search Tool

A search using the EPBC Act Protected Matters Search Tool was undertaken on 5 June 2017. See **Figure B19-3** for details of the search area (see **Appendix BD** for the full search report).




Search area (this approximates the CSD Project Study Area):

- -16.700123, 145.613589
- -16.700123, 145.915229
- -17.052245, 145.915229
- -17.052245, 145.613589

**Figure B19-3** EPBC Act Protected Matters search area.

**Source:** EPBC Act Protected Matters Search Tool accessed 5 June 2017. See **Appendix BD**.

This search revealed the presence of the following MNES for each controlling provision.

**TABLE B19-1 RELEVANT CONTROLLING PROVISIONS**

| CONTROLLING PROVISION | SEARCH RESULTS |
|---|---|
| World Heritage properties (sections 12 and 15A) | Great Barrier Reef<br>Wet Tropics of Queensland |
| National Heritage places (sections 15B and 15C) | Great Barrier Reef<br>Wet Tropics of Queensland<br>Wet Tropics World Heritage Area (Indigenous Values) |
| Listed threatened species and communities (sections 18 and 18A) | 72 species, 2 communities |
| Listed migratory species (sections 20 and 20A) | 64 species |
| Commonwealth marine areas (sections 23 & 24A) | Generally the Commonwealth Marine Area stretches from three nautical miles to two hundred nautical miles from the coast |
| Great Barrier Reef Marine Park (sections 24B and 24C) | Great Barrier Reef Marine Park |
| Commonwealth land (sections 26 & 27 A) | • Defence – Cairns Vacant Site<br>• Defence – HMAS Cairns - Cairns<br>• Defence – Kenny Street Naval Stores - Cairns<br>• Defence – Las Palmas Motel - Cairns<br>• Defence – Northern Heritage Motel - Cairns<br>• Defence – Porton Training Depot - Cairns<br>• Defence – Queerah Magazine |

**Source:** EPBC Act Protected Matters Search Tool accessed 5 June 2017. See **Appendix BD** for the full search report.

### B19.1.4.b Spatial Assessment

Those matters of NES that are mappable are shown on **Figure B19-4**.

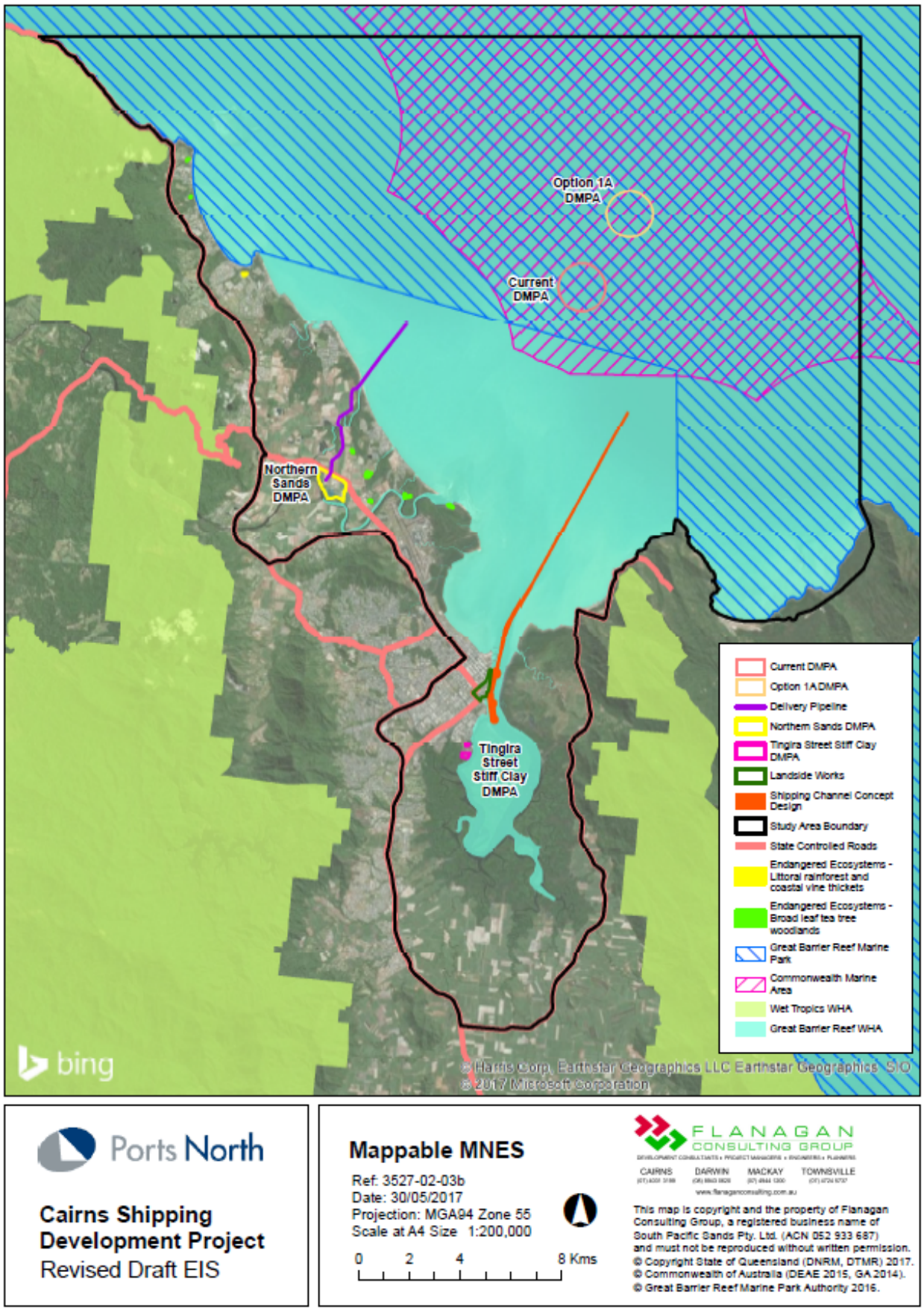



**Figure B19-4** Location of mappable matters of NES.

A GIS analysis of the data upon which this figure is based shows the following (refer to **Sections 0** to **B19.18** for details). It should be noted that this is a spatial screening only and applies for defined areas – for species and communities, a subsequent assessment is made as to actual presences and later, likely impacts.

**TABLE B19-2 SPATIAL ASSESSMENT**

| MNES | POTENTIAL SPATIAL APPLICABILITY BY PROJECT AREA | | | | |
|---|---|---|---|---|---|
| | **Northern Sands Project Area** | **Tingira Street Project Area** | **Shipping Channel** | **Current & Option 1A offshore DMPA** | **Landside Works** |
| GBR WHA & National Heritage Place | Adjacent (delivery pipeline corridor within) | Adjacent | Within | Within | Adjacent |
| WT WHA & National Heritage Place & Indigenous Values | Remote (downstream) | Remote (downstream) | Remote (downstream) | Remote (downstream) | Remote (downstream) |
| Listed threatened species | Potential | Potential | Potential | Potential | Potential |
| Listed threatened communities | Potential | Potential | Outside | Outside | Included |
| Listed migratory species | Potential | Potential | Potential | Potential | Potential |
| Commonwealth marine areas | Outside | Outside | Outside | Current – outside; Option 1A - within | Outside |
| Great Barrier Reef Marine Park | Outside | Outside | Outside | Within | Outside |
| Commonwealth land | Outside | Outside | Outside | Outside | Outside |

**Figure B19-5** – extracted from the Great Barrier Reef Region Strategic Assessment Report produced by the Great Barrier Reef Marine Park Authority (GBRMPA 2014a) – shows diagrammatically the spatial extent of MNES near a typical coastal site (with the exception of the WTWHA). Adjacent to the Study Area this WHA commences at the foothills that would lie well to the left of the area covered by this schematic.

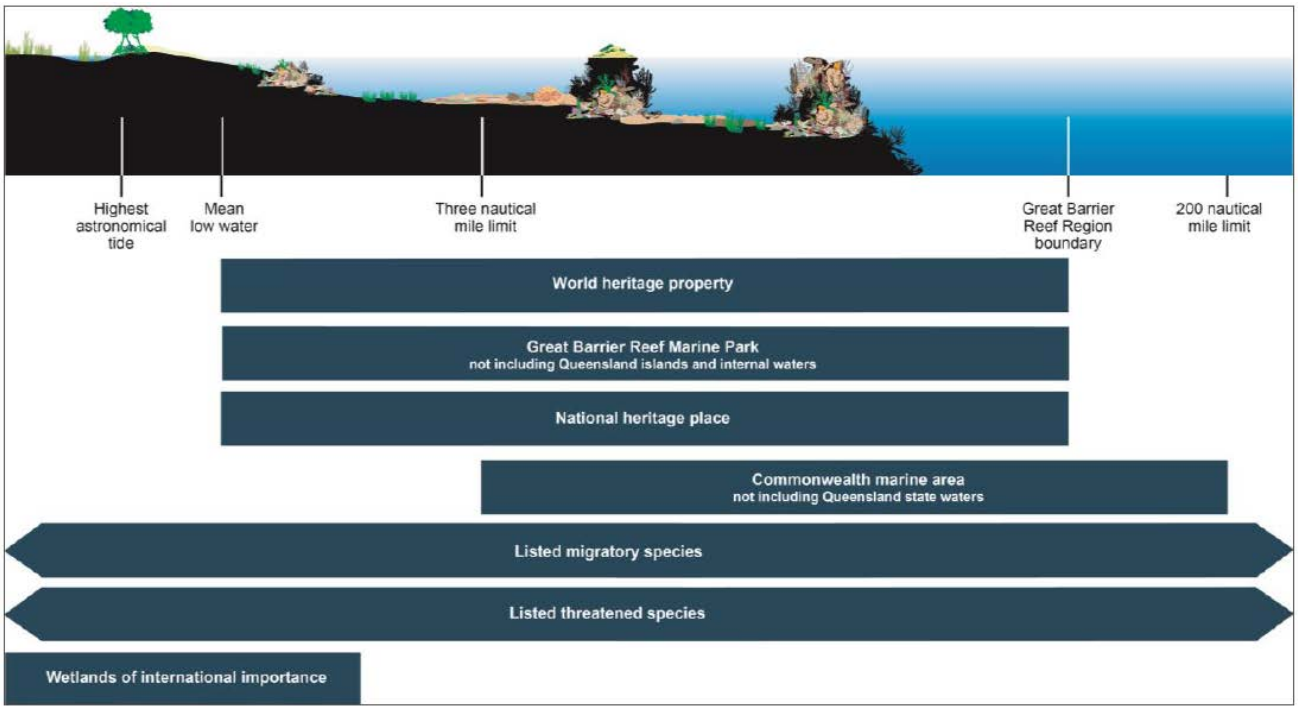



**Figure B19-5** Spatial extent of the matters of NES for the Great Barrier Reef Region.

**Source:** GBRMPA (2014a) (Figure 4.3). The WTWHA commences at the foothills that would lie well to the left of the area covered by this schematic.

The following figure (**Figure B19-6**) and table (**Table B19-3**) – extracted from GBRMPA (2014a) – are useful in interpreting local boundaries of the GBR Region, the GBRWHA, and the GBRMP.

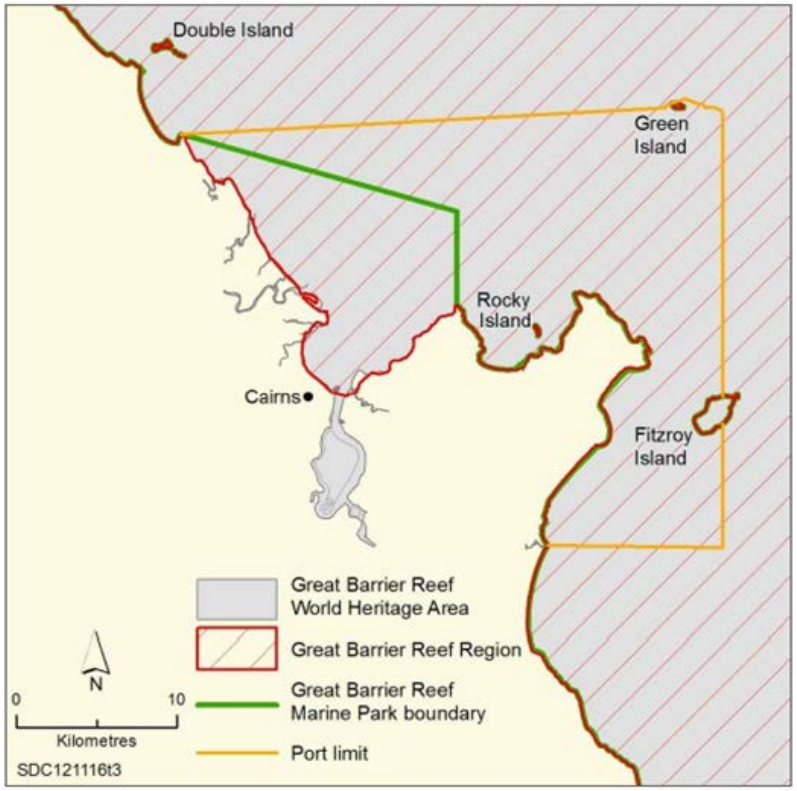



**Figure 1.4 An example of the different coastal boundaries for the Great Barrier Reef World Heritage Area, Region and Marine Park**

As illustrated in this map of the area around Cairns, the Great Barrier Reef World Heritage Area includes all internal waters and islands of Queensland, for example enclosed bays and estuaries, and Green and Fitzroy islands. The Great Barrier Reef Region includes all waters seaward of low water, but not the internal waters and islands of Queensland (such as Green and Fitzroy islands). The Region includes Commonwealth islands. The Great Barrier Reef Marine Park has the same boundary as the Region, except that defined areas around most trading ports are excluded. The Marine Park boundary around ports is different from the port limit which is defined in relation to operation of the port itself.

**Figure B19-6** Local boundaries of the GBR region, the GBRWHA, and the GBRMP.

**Source:** GBRMPA (2014a) (Figure 1.4).

**Table B19-3** below extracted from GBRMPA (2014a) lists the differences between the GBR World Heritage Area, GBR Region and GBR Marine Park.

**TABLE B19-3 DIFFERENCES BETWEEN THE GBR WORLD HERITAGE AREA, GBR REGION AND GBR MARINE PARK**

| Great Barrier Reef World Heritage Area | Great Barrier Reef Region | Great Barrier Reef Marine Park |
|---|---|---|
| 348,000 $km^2$ | 346,000 $km^2$ | 344,400 $km^2$ |
| Inscribed 1981 | Established 1975 | Declared in sections between 1979 and 2001; amalgamated into one section in 2003 |
| Includes:<br>• all islands within outer boundary (about 1050)<br>• all waters seaward of low water mark (including internal waters of Queensland and port waters)<br>• all 12 trading ports | Includes:<br>• approximately 70 Commonwealth islands<br>• all waters seaward of low water mark (excluding Queensland internal waters)<br><br>Does NOT include:<br>• internal waters of Queensland<br>• Queensland islands (about 980) | Includes:<br>• approximately 70 Commonwealth islands<br>• all waters seaward of low water mark (excluding Queensland internal waters)<br><br>Does NOT include:<br>• internal waters of Queensland<br>• Queensland islands (about 980)<br>• 13 coastal exclusion areas |

**Source:** GBRMPA (2014a) (Table 1.2).

The above relevant controlling provisions are discussed below in terms of:

- presence of matter (based on the protected matters search and/or other relevant research) and a discussion of the underlying values of the matter
- risk of mitigated impact on the values (based extensively on other technical chapters as noted in **Table B19-4** below)
- consistency with international obligations, agreements, management plans etc. (where relevant).

### B19.1.4.c Broad Cross-reference to other Chapters

**Table B19-4** below shows at a high level details of where relevant matters are assessed elsewhere in this Revised Draft EIS. More detailed discussion is included where relevant.

**TABLE B19-4 CROSS REFERENCE TO OTHER REVISED DRAFT EIS CHAPTERS**

| Chapter | Matter | Details |
|---|---|---|
| B2 (Nature Conservation Areas) | World Heritage properties<br>National Heritage places<br>Commonwealth marine areas<br>Great Barrier Reef Marine Park | Existing situation<br>Impacts<br>Mitigation<br>Residual impacts |
| B5 (Marine Water Quality | World Heritage properties (marine)<br>National Heritage places (marine)<br>Listed threatened species (marine)<br>Listed migratory species (marine)<br>Commonwealth marine areas<br>Great Barrier Reef Marine Park | Existing situation<br>Impacts<br>Mitigation<br>Residual impacts |
| B7 (Marine Ecology) | World Heritage properties (marine)<br>National Heritage places (marine)<br>Listed threatened species (marine)<br>Listed migratory species (marine)<br>Commonwealth marine areas<br>Great Barrier Reef Marine Park | Existing situation<br>Impacts<br>Mitigation<br>Residual impacts |

| Chapter | Matter | Details |
|---|---|---|
| B8 (Terrestrial Ecology) | World Heritage properties (terrestrial)<br>National Heritage places (terrestrial)<br>Listed threatened species and communities (terrestrial)<br>Listed migratory species (terrestrial) | Existing situation<br>Impacts<br>Mitigation<br>Residual impacts |
| B12 (Landscape and Visual) | Outstanding Universal Value (criterion vii) | Existing situation<br>Impacts<br>Mitigation<br>Residual impacts |
| B18 (Cumulative Impacts Assessment) | Matters relevant to CSD Project activities as assessed in GBRMPA (2014a) | Cumulative and consequential impacts |

# B19.2 Legislation and Policy Background

## B19.2.1 Objects of the EPBC Act

The objects of the EPBC Act are:

(a) to provide for the protection of the environment, especially those aspects of the environment that are matters of national environmental significance; and

(b) to promote ecologically sustainable development through the conservation and ecologically sustainable use of natural resources; and

(c) to promote the conservation of biodiversity; and

(ca) to provide for the protection and conservation of heritage; and

(d) to promote a co-operative approach to the protection and management of the environment involving governments, the community, land-holders and indigenous peoples; and

(e) to assist in the co-operative implementation of Australia's international environmental responsibilities; and

(f) to recognise the role of indigenous people in the conservation and ecologically sustainable use of Australia's biodiversity; and

(g) to promote the use of indigenous peoples' knowledge of biodiversity with the involvement of, and in co-operation with, the owners of the knowledge.

An assessment of the CSD Project against these objects is provided in **Table B19-24**.

### B19.2.1.a Meeting International Obligations

The EPBC Act provides the major (but not only) mechanism by which Australia meets its international obligations. Referring to Commonwealth of Australia (2009):

- The Commonwealth's jurisdiction over environmental matters comes from the Australian Constitution.
- The EPBC Act specifies the matters for which the Commonwealth has regulatory responsibility, and is derived from the 1992 Intergovernmental Agreement on the Environment and the 1997 COAG Heads of Agreement.
- The objects of the EPBC Act are set out in section 3 of the Act.
- At its foundation is the principle of ecologically sustainable development (ESD), which encapsulates the precautionary principle and the principle of intergenerational equity.
- The EPBC Act is not the sole means of providing biodiversity and heritage protection – it operates in the context of other regimes and Australian Government policies, including the Native Vegetation Framework, Australia's Oceans Policy and Caring for our Country, as well as via a range of international agreements (e.g. the China–Australia Migratory Bird Agreement (CAMBA), Japan–Australia Migratory Bird Agreement (JAMBA), Republic of Korea–Australia Migratory Bird Agreement (ROKAMBA)).
- The Act interacts with State and Territory legislative and administrative regimes dealing with environmental management and protection.
- Maintaining an appropriate role for the Commonwealth with respect to the environment and heritage is important in the context of maintaining an appropriate division of responsibilities between the Commonwealth and the States and Territories.

### B19.2.2 EPBC Act Regulations

As required by the ToR, this EIS addresses all matters required by Division 5.2 of the Environment Protection and Biodiversity Conservation Regulations 2000 (Cwlth) and Schedule 1 of the State Development and Public Works Organisation Regulation 2010 (Qld) – refer to **Appendix C** for a detailed checklist of where issues are addressed. Additional matters are:

- environmental record of the proponent – refer to **Section B19.2.4.f**
- reliability of information – see **Section B19.4.3** and **Section**
- cost of mitigation measures – refer to **Section B19.21.1**
- dealing with uncertainty – see **Section B19.23**.

### B19.2.3 EPBC Act Offsets Policy

Offsets under the EPBC Act are covered by the EPBC Act Environmental Offsets Policy produced by the former Department of Sustainability, Environment, Water, Population and Communities (SEWPaC 2012). According to this policy, offsets are only required if residual impacts are 'significant'. Significance is determined by reference to the significant impact guidelines prepared by the former Department of the Environment (Commonwealth) (DoE 2013a).

Environmental offsets are measures that compensate for the residual adverse impacts of an action on the environment. That is, offsets are designed to provide environmental benefits to counterbalance the impacts that remain after avoidance and mitigation measures. These remaining, unavoidable impacts are termed 'residual impacts'.

If it is determined that an offset is required under the EPBC Act, then an offsets package should be proposed. This is a suite of actions that a proponent undertakes to compensate for the residual significant impact of a project. It can comprise a combination of direct offsets and other compensatory measures. Direct offsets are those actions that provide a measureable conservation gain for an impacted protected matter. Direct offsets are required to make up a minimum of 90% of the offset requirement for any given impact.

Direct offsets deliver a net conservation gain to the protected matter which maintains or increases it viability or reduces any threats of damage, destruction or extinction. A conservation gain may be achieved by:

- improving existing habitat for the protected matter
- creating new habitat for the protected matter
- reducing threats to the protected matter
- averting the loss of a protected matter or its habitat that is under threat.

Other compensatory measures are those actions that do not directly offset the impacts on the protected matter, but are anticipated to lead to benefits for the impacted protected matter e.g. funding for research or educational programs.

Best-practice environmental management is documented in the Great Barrier Reef Region Strategic Assessment (Appendix 2 of GBRMPA 2014a), namely avoid, mitigate, offset, and adaptively manage impacts. This approach has been undertaken for the CSD Project as explained in the sections describing each controlling provision. Opportunities for impact avoidance and minimisation /mitigation are discussed each technical chapter and summarised in the assessment of each controlling provision (i.e. **Sections 0 to B19.18**).

## B19.2.4 Environmentally Sustainable Development

According to Australia's 1992 National Strategy for Ecologically Sustainable Development (Department of the Environment 2013b) ecologically sustainable development (ESD) is 'using, conserving and enhancing the community's resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be increased'.

The Strategy includes a goal, core objectives, and guiding principles as noted below.

### B19.2.4.a Goal:

- Development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends.

### B19.2.4.b Core Objectives:

- to enhance individual and community well-being and welfare by following a path of economic development that safeguards the welfare of future generations
- to provide for equity within and between generations
- to protect biological diversity and maintain essential ecological processes and life-support systems.

### B19.2.4.c Guiding Principles:

- Decision making processes should effectively integrate both long and short-term economic, environmental, social and equity considerations.
- Where there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.
- The global dimension of environmental impacts of actions and policies should be recognised and considered.
- The need to develop a strong, growing and diversified economy which can enhance the capacity for environmental protection should be recognised.
- The need to maintain and enhance international competitiveness in an environmentally sound manner should be recognised.
- Cost effective and flexible policy instruments should be adopted, such as improved valuation, pricing and incentive mechanisms.
- Decisions and actions should provide for broad community involvement on issues which affect them.

The 1992 strategy was given effect in a slightly modified form in the EPBC Act (Section 3A) as follows:

- Decision-making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations (the 'integration principle').
- If there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation (the 'precautionary principle').
- The principle of inter-generational equity – that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations (the 'intergenerational principle').
- The conservation of biological diversity and ecological integrity should be a fundamental consideration in decision-making (the 'biodiversity principle').
- Improved valuation, pricing and incentive mechanisms should be promoted (the 'valuation principle').

Under the EPBC Act, the ESD strategy applies to Commonwealth agencies (i.e. not private developers) that need to report against two core criteria:

- how agencies accord with and contribute to ESD
- to report the environmental performance of agencies, that is the impact their activities have on the natural environment, how these are mitigated and how they will be further mitigated.

The EPBC Act defines the 'environment' to mean:

- ecosystems and their constituent parts, including people and communities
- natural and physical resources
- the qualities and characteristics of locations, places and areas
- heritage values of places (including places on the Register of the National Estate kept under the *Australian Heritage Council Act 2003*), and
- the social, economic and cultural aspects of the things mentioned above.

An assessment of the CSD Project against the ESD policy is provided in **Table B19-24** and the ensuing discussion.

### B19.2.4.d National Heritage Places

In 1997, the Council of Australian Governments agreed that heritage listing and protection should be the responsibility of the level of government best placed to deliver agreed outcomes. It was agreed that the Commonwealth's involvement in environmental matters should focus on matters of national environmental significance, including World Heritage properties and places of national significance. Each state, territory and local government has a similar responsibility for its own heritage.

This led to the creation of two new heritage lists in 2003:

- under the EPBC Act, the National Heritage List includes places of outstanding heritage value to the nation
- the Commonwealth Heritage List includes heritage places owned or controlled by the Commonwealth.

The protection of heritage places for which the Commonwealth Government is responsible continues under the EPBC Act. The act not only protects heritage from actions by the Commonwealth, but also protects places on the National Heritage List, on the Commonwealth Heritage List, and on Commonwealth land. All proponents, not just the Commonwealth, are required to seek approval for actions that could have a significant impact on the heritage values of these places.

Of relevance to this chapter is the fact that both the Great Barrier Reef and the Wet Tropics of Queensland are also listed as National Heritage places.

### B19.2.4.e Objects of the GBRMP Act and Regulations

The *Great Barrier Reef Marine Park Act 1975* (Cwlth) requires the Great Barrier Reef Marine Park Authority to have regard to, and seek to act in a way that is consistent with, the objects of the Act, the protection of the world heritage values of the Great Barrier Reef World Heritage Area, and the principles of ecologically sustainable use.

No approvals are required under this Act although its associated zoning plan involves joint management arrangements with the Queensland Government over the Great Barrier Reef Coast Marine Park (state) and is therefore relevant. Refer also **Chapter B2** (Nature Conservation Areas).

### B19.2.4.f Environmental Record of Proponent

Ports North have a successful history of compliance with its environmental obligations, permits and approvals for operations and major projects. It manages several ports and associated shipping activities in areas of high conservation value. Whilst operating in such environments, Port North continues to maintain a high level of compliance and effective management of its port operations without the occurrence of significant environmental harm or major incident, fine or reprimand. An Environmental Management System consistent with ISO14001 is in place which addresses environmental management issues including planning, checking, and continual review of Ports North's management system and procedures inclusive of emergency response plans, loading and unloading of ships, stormwater management, oil spill response and waste controls. The EMS has been subject to external audits with a view to proceeding to ISO14001 certification in the future.

Ports North continues to demonstrate a sound environmental management record, and meets its environmental duty through implementation of systems and procedures, without prosecution for non-compliance with Environmental Approvals, nor have there been any major environmental incident events attributable to Ports North staff, or contractors engaged in activities under its operational control.

**Appendix D** (Ports North Management Policies) provides copies of relevant Ports North corporate Health, Safety and Environmental Policies.

Ports North has a number of Ecological Monitoring Programs in place to measure and assess potential impacts associated with port operations including:

- Sediment Analysis Plan for dredging and disposal of maintenance dredge material to an approved marine disposal site
- Long Term Management Plan for the management of maintenance dredging and dredge material disposal
- Water Quality Monitoring Program in Trinity Inlet
- Marine Pest Monitoring Program to detect the presence of marine pests
- Long term Seagrass Monitoring Program.

These programs produce valuable data which helps provide a long term measure of the status of the ecological health of the port catchment. The programs also measure the effectiveness of various management initiatives implemented to control the activities that the port operator can influence, thus reducing the risk of potential impacts to the environment in and around the Port.

Ports North has extensive experience in delivering major projects and managing port infrastructure while maintaining a high level of environmental management. The Cityport Masterplan was subject to an Impact Assessment Study, including consideration under the EPBC Act in the late 1990s and has been subsequently delivered in a number of stages with works involving capital dredging for marina expansions, marina and wave barrier construction, minor reclamation, foreshore protection and beautification, heritage wharf and shed refurbishments and backing land de-contamination. These projects required approvals of a similar scale to this proposed project, and were completed without any major adverse or unforeseen environmental impacts and to the satisfaction of regulatory agencies.

Ports North has demonstrated a long history of undertaking scientific research and monitoring especially in the area of dredging and disposal, including as a key stakeholder in the Trinity Inlet Management Program (1990s-2002), and the joint 5 year James Cook University-CPA 'Environmental Sedimentology of Trinity Bay' (1997-2002).

Ports North has not been subject to any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources.

Ports North has maintained compliance with both Commonwealth and State approvals for dredging and disposal over a long period, without compliance action or adverse audit findings, and presently holds a ten-year Sea Dumping Permit and an associated Long Term Management Plan for maintenance dredging activities under the joint *Environmental Protection (Sea Dumping) Act 1981* (Cwlth), *Great Barrier Reef Marine*

*Park Act 1975* (Cwlth) and *Marine Parks Act 2004* (Qld). An approval for Cairns was granted in 2010 and this 10 year permit term expires in 2020.

Approval of a five (5) year Sea Dumping Permit and Long Term Management Plan (LTMP) (Environment North 2005) was granted by the GBRMPA in 2005, and building on outcomes of that term, a ten (10) year Sea Dumping Permit and LTMP is approved for the term to 2020. This was the first of the ten year Sea Dumping Permits and LTMPs approved by SEWPaC/GBRMPA for maintenance dredging activities, and clearly demonstrates Ports North's commitment to effective environmental management of dredging activities within Trinity Inlet, and a clear indication that Ports North is committed to continue this approach into the future.

**TABLE B19-5 PORTS NORTH REFERRAL HISTORY**

| EPBC REFERENCE | TITLE | DOCUMENT LOCATION | STATUS |
|---|---|---|---|
| 2000/31 | Cairns Cityport Project | http://www.environment.gov.au/cgibin/epbc/epbc_ap.pl?name=current_referral_detail&proposal_id=31 | Approved and commenced 2001 |
| 2013/6981 | Common User Barge Facility, Cairns Qld, Australia | http://www.environment.gov.au/cgibin/epbc/epbc_ap.pl?name=current_referral_detail&proposal_id=31 | Not a Controlled Action |
| 2012/6538 | Cairns Shipping Development (Trinity Inlet) Project | Far North Queensland Ports Corporation Limited (t/a Ports North)/Transport - Land/Trinity Inlet, Cairns/Queensland/Cairns Shipping Development (Trinity Inlet) Project, QLD<br>http://epbcnotices.environment.gov.au/referralslist/# | Controlled Action (06 Sep 2012) |

# B19.3 Project Overview

## B19.3.1 Introduction

The CSD Project is described in detail in **Chapter A3** (Project Description) while its evolution is documented in **Chapter A2** (Project Background). A summary of this information sufficient to provide the necessary context for this chapter is included below.

## B19.3.2 Project Elements

The revised project involves upgrading the following port infrastructure to enable larger cruise ships greater than 300 m in length to berth at the Port of Cairns:

- **Marine works** to widening and deepen of the shipping channel and Crystal swing basin, and establishment of a new shipping swing basin (Smith Creek Swing Basin) upstream of the existing Main Swing Basin involving:
    - Capital dredging works involving removal of up to 1 000 000 $m^3$ of dredge material consisting of up to 900 000 $m^3$ of soft clays to be removed by a Trailer Suction Head Dredge (THSD) and 100 000 $m^3$ of stiff clays to be removed by a Back–Hoe Dredge (BHD).
    - Construction of a temporary pump out facility located approximately 2.8 km off-shore from Yorkeys Knob.
- **Delivery and placement of dredged material** to land based Dredge Material Placement Areas (DMPAs) including:
    - Construction of a temporary dredge material delivery pipeline from the dredge mooring point and pump out facility to the soft clay DMPA on the Barron Delta (Northern Sands DMPA)
    - Placement of soft clay dredge material at the Barron Delta DMPA located on Lot 2/RP712954 and Lot 5 on SP245573
    - Placement of stiff clay dredge material at the Tingira St DMPA established on Port Land (Lot 27/SP 218291) located at Tingira St, Portsmith.
- **Ancillary infrastructure/services upgrades** including:
    - Relocation of existing and installation of new navigational aids.
    - Fender system upgrade to the existing cruise shipping Wharves 1-5 to accommodate larger and heavier cruise ships. Decommissioning of Wharf 6 including retention and upgrading of key bollards and retention of representative historic elements
    - Upgrade of ship services to the cruise shipping wharves, including infrastructure to supply Intermediate Fuel Oil (IFO), potable water and fire-fighting services.

Maintenance dredging including minor increases as a result of the project (estimated at 2-6% of existing annual amount) will continue to occur, and be placed at the existing marine placement site.

## B19.3.3 Assumed End Use of DMPAs

### B19.3.3.a Northern Sands DMPA

The Northern Sands DMPA contains an operating sand mine and a 25 ha water-filled void that is to be enlarged and used for the placement of soft clays pumped to the site. The current void contains fresh water from groundwater seepage and rainfall.

The soft clay placement campaign will fill all or most of the void over a period of some three months. Once this filling is complete, the DMPA will revert to the control of the owner who will then determine subsequent uses. No assumptions can be made about this use although current approvals imply that at some time the void is to be completely filled.

### B19.3.3.b Delivery Pipeline

Soft clay will be delivered to the DMPA via the dredge material delivery pipeline which commences at the offshore pump out facility located approximately 2.8 km offshore from Yorkeys Knob. The marine section of the pipeline will be submerged, while the landward section will be constructed above ground and suspended on low (<0.5 m) earthen plinths. Up to three booster stations may be necessary because of the pipeline length. Booster stations will be placed in cleared grassland areas or cane headlands in consultation with landowners, to minimise interference with farming operations.

After the completion of the soft clay placement campaign, the dredge mooring point, inlet pipeline (landward and marine sections) and booster stations will be disassembled and removed. The disturbed area will be restored and the small amount of natural vegetation cleared for its construction will be rehabilitated using appropriate native species as described in **Chapter C1** (Construction Environmental Management Plan). A specific Restoration Plan will be prepared during the approvals phase and implemented for this purpose.

### B19.3.3.c Tailwater Discharge Pipeline(s)

Similarly, the tailwater discharge pipelines will be disassembled and removed and the disturbed area restored and rehabilitated as described in **Chapter C1** (Construction Environmental Management Plan).

### B19.3.3.d Tailwater Ponds

When no longer required, the tailwater ponds will be filled and the disturbed area restored such that the area can be re-used for existing use such as growing sugar cane. No rehabilitation will be necessary.

### B19.3.3.e Tingira Street Project Area

The Tingira Street DMPA is currently cleared (although some marine plants have recolonised much of the area not covered by anthropogenic grasslands) and in its past has been filled to above Highest Astronomical Tide. The placed stiff clay will be used to fill and preload the site to accelerate settlement. As a separate project, Ports North intends to import additional fill and construct industrial hardstands and other infrastructure. This project has been under consideration for many years and most of the necessary approvals have already been obtained.

Of relevance to the consideration of terrestrial ecological impacts is the fact that no rehabilitation will be possible following the stiff clay placement.

### B19.3.4 Environmental Management

In this chapter only residual impacts are discussed, i.e. those existing after the application of the committed environmental management. A range of mitigation and monitoring measures are outlined by the project to protect the values of the study area. These are summarised in Part C of the EIS and apply (generally) to the EPBC Act issues as shown in **Table B19-6** below.

**TABLE B19-6 DOCUMENTS DESCRIBING PROJECT MANAGEMENT MEASURES AND MITIGATION**

| RELEVANT DOCUMENT IN PART C OF THE EIS | APPLICABLE MNES |
|---|---|
| **Chapter C1** (Construction Environmental Management Plan) | Great Barrier Reef World Heritage Area<br>Nationally Important Wetland – Trinity Inlet<br>Listed threatened species (terrestrial)<br>Listed migratory species (terrestrial)<br>Integrity (especially stormwater quality runoff) |
| **Chapter C2** (Dredge Management Plan) | Great Barrier Reef World Heritage Area<br>Great Barrier Reef Marine Park<br>Nationally Important Wetland – Trinity Inlet<br>Integrity (especially water quality during dredging and placement) |
| **Chapter C3** (Vessel Traffic Management Plan) | Great Barrier Reef World Heritage Area<br>Great Barrier Reef Marine Park<br>Nationally Important Wetland – Trinity Inlet |
| **Chapter C4** (Maritime Operations Management Plan) | Great Barrier Reef World Heritage Area<br>Great Barrier Reef Marine Park<br>Nationally Important Wetland – Trinity Inlet |

# B19.4 Overview of Study Area

## B19.4.1 Marine Areas

This section is based on **Chapter B7** (Marine Ecology).

Cairns harbour is a shallow, north-facing coastal embayment located adjacent to the city of Cairns. Cairns harbour is a low energy environment that is the receiving environment for several coastal drainages, including Trinity Inlet, Barron River and several coastal creeks. Due to its shallow depths and the plentiful supply of fine terrigenous sediments from the Barron River and other coastal drainages, wind and tidal currents regularly result in re-suspension of sediments and high turbidity within Trinity Bay.

Trinity Inlet is a large estuary that is fed by several minor drainages including Skeleton, Chinaman, Blackfellows, Wrights, Redbank, Wahday, Falls and Seelee Creeks. It is thought that the Trinity Inlet once formed the mouth of the Mulgrave River, but was diverted southwards as a result of sediment accumulation on the coastal plain. As Trinity Inlet is not flushed by a major river, it represents a tidally dominant system with less variation in salinity than is usual in estuaries in high rainfall areas. The coastal drainages, together with Admiralty Island, form a complex bio-physical setting that provides important habitats for a range of estuarine plant and animal species.

The Barron River is a highly modified system; the major factors influencing its water quality and ecology include alterations to its catchment (particularly in the lower reaches), flow regulation further upstream of the project, and fishing pressure. The catchment surrounding the lower Barron River is heavily modified and only a thin strip of native riparian vegetation remains over much of its length since it was cleared in the late 1800s. Prior to 1939, the Barron River mouth opened into Trinity Inlet further south, towards Ellie Point.

The East Trinity Reserve area consists of a large wetland complex that is transitioning from a highly degraded acid lake into a modified intertidal wetland. Tidal influence was removed from the site in the early 1970s when a bund wall and tide gates were installed. The combined loss of tidal regime and earthworks resulted in intense acidification. The Queensland Government began remediation from the mid 2000s using tide gates to dampen the tidal signal and neutralise acidity by adding soluble lime during incoming tide phases. These changes have resulted in extensive vegetation changes, dieback phases and subsequent mangrove re-colonisation upon return to a tidal state.

Cairns Harbour, Trinity Inlet, East Trinity, and the Barron River contain highly valued ecological communities including:

- a wide diversity of marine habitat types including sandy beaches, mangrove forests, saltmarshes, intertidal shoals, seagrass meadows, subtidal soft sediment habitats, rock walls and rocky shores
- an extensive area of mangroves exhibiting a range of species and community types, some of which are limited in their distribution elsewhere
- seagrass beds which represent one of the only two major seagrass areas between Hinchinbrook Island and Cooktown (however, the meadow size is presently far smaller than previously mapped)
- mangroves, saltmarsh seagrass meadows and ‘unvegetated’ soft sediment habitats and other associated wetlands which have been recognised as important nursery areas for juvenile fish and prawns of commercial importance
- habitats for a wide range of fish and shellfish species of direct economic significance:
    - a range of habitat types that significantly underpin the biodiversity values of the region
    - habitats that are important to migratory waders of international significance
    - potential feeding areas for marine turtles, dugongs, whales, and dolphins, which are listed as threatened or migratory under Commonwealth and/or Queensland legislation.

## B19.4.2 Terrestrial Areas

This section is based on **Chapter B8** (Terrestrial Ecology).

### B19.4.2.a Overview

The terrestrial part of the Study Area is located in or adjacent to the Wet Tropics World Heritage Area (WTWHA) and the Great Barrier Reef World Heritage Area (GBRWHA). Both the areas are recognised as outstanding examples of biodiversity, habitat for threatened species, species endemism and intact ecological processes.

On land, there is a diverse array of vegetation communities across the Cairns region, supporting a high level of faunal and floral diversity. Various types of mesophyll, notophyll and microphyll vine forest (rainforest) dominate eastern parts of the region where large remnant forests exist, whilst sclerophyll forests and woodlands dominate in the western parts across the Great Dividing Range.

There are also high levels of habitat fragmentation across the Cairns region, particularly in lowland habitats due to the concentration of buildings, agriculture, forestry and transport infrastructure. The Northern Sands and Tingira Street project areas lie in what is the most fragmented landscape in the region due to the concentration of urban, industrial, agricultural, and residential development.

No terrestrial project areas lie within WTWHA or the GBRWHA, although the latter runs to low water adjacent to both DMPAs and is crossed by the Northern Sands inlet pipeline corridor.

### B19.4.2.b Landside Works Project Area

The existing environment at the Landside Works Project Area was assessed in Chapter B8 (Terrestrial Ecology) of the Draft EIS. This was the only part of the then-defined CSD Project to be constructed on land. Referring to the Draft EIS, no mapped vegetation communities (mapped under the *Vegetation Management Act 1999* (Qld) – VM Act) occur within the project area (see **Figure B19-7**). However, scattered individual trees do exist in landscaped areas such as the open-grassed park area to the north of Shed 2 and a landscaped area between Shed 3 (the CCLT) and Wharf St. These areas contain common landscaping trees such as Figs (*Ficus spp*.), Palms (e.g. *Cocos nuficera* and *Pandanus spp*.) and Jacaranda (*Jacaranda spp.*), amongst others. Scattered trees (e.g. palms and *Casuarina spp.*) also exist in the more industrial areas in the south of the project area.

Although mapping under the VM Act is not relevant to MNES, it does give an indication of land cover and the potential habitat for listed threatened species. **Figure B19-7** shows that the only vegetation communities of ecological significance are located on the eastern side of Trinity Inlet. This includes a large area of mangrove forests that are mapped under the VM Act as remnant and regrowth Regional Ecosystems (RE). Mapped remnants include:

- Not of Concern RE7.1.1 (mangrove closed scrub to open forest which is subject to regular tidal inundation)
- Of Concern 7.1.2a (estuarine wetlands comprised of Samphire flats with open forbland to sparse forbland of *Tecticornia spp*. (Samphire) and *Suaeda australis* (Sea Blite).

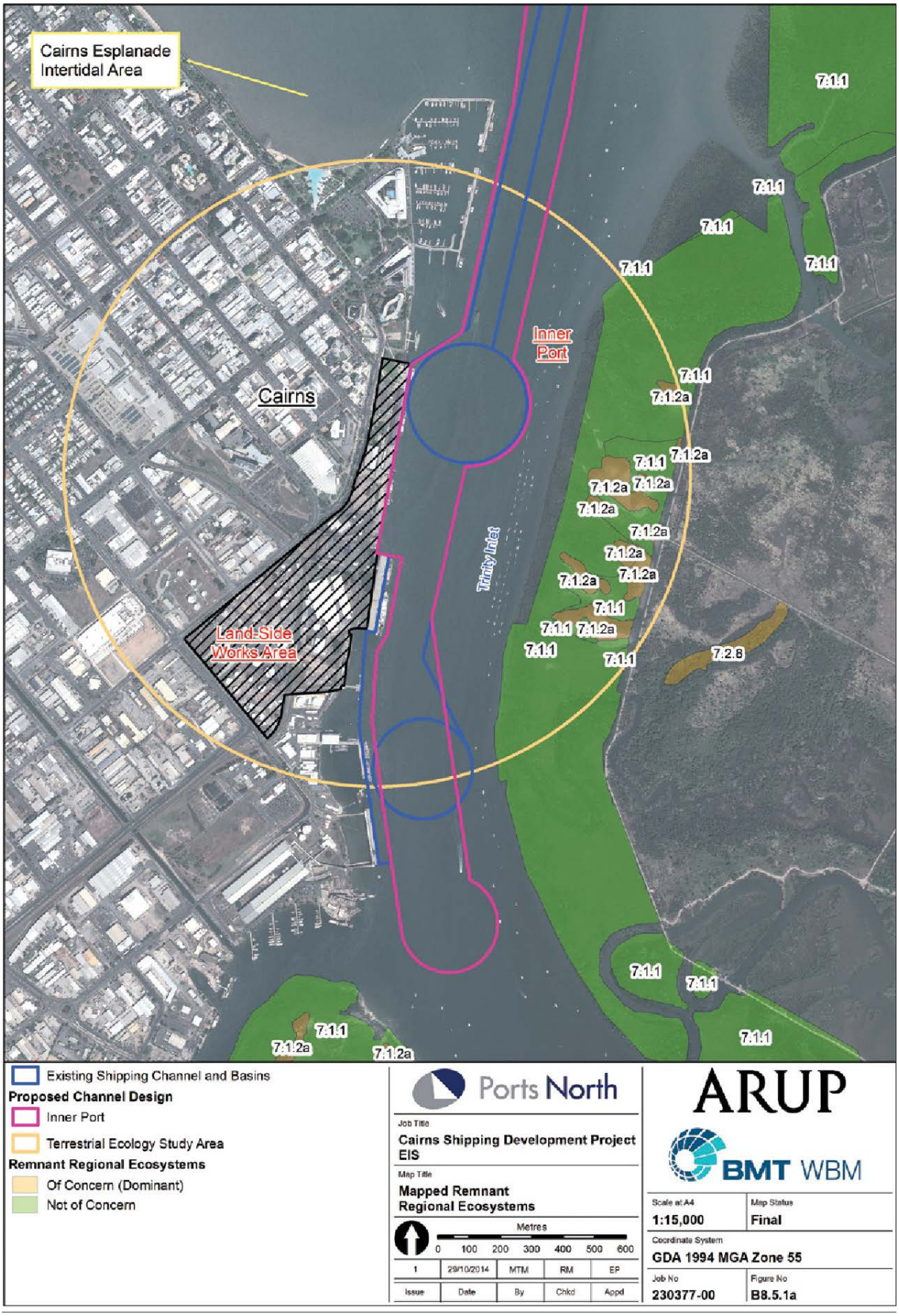



**Figure B19-7** Landside Works Project Area showing mapped natural vegetation.

**Source:** Draft EIS (Ports North 2014).

A review of the Draft EIS shows that the Landside Works Project Area contains no natural values. Accordingly, this project area is not considered further in this chapter.

### B19.4.2.c Northern Sands Project Area

#### Northern Sands DMPA

The Northern Sands DMPA is located on Lots 2/RP712954, 5/SP245573, and 6/SP245573. This parcel covers an area of about 84 hectares of the Barron River floodplain adjacent to the Barron River. The parcel contains an operating sand mine and the water-filled void resulting from sand extraction is licensed to receive inert construction and demolition waste, and up to 5000 $m^3$ / annum of potential acid sulfate soil, both of which are placed into the void below the water table. The current void covers an area of about 25 hectares and contains fresh water from groundwater seepage and rainfall. This waterbody is known locally as 'Lake Narelle'.

The Northern Sands DMPA site is characterised by cleared lands with two small areas of remnant vegetation bordering the Barron River. Only these areas contain native vegetation with the remainder of the site dominated by anthropogenic grasslands, dredge ponds, and sand handling and other infrastructure (see **Figure B19-8**). The native vegetation that remains on site is edge-affected and retains limited natural value.

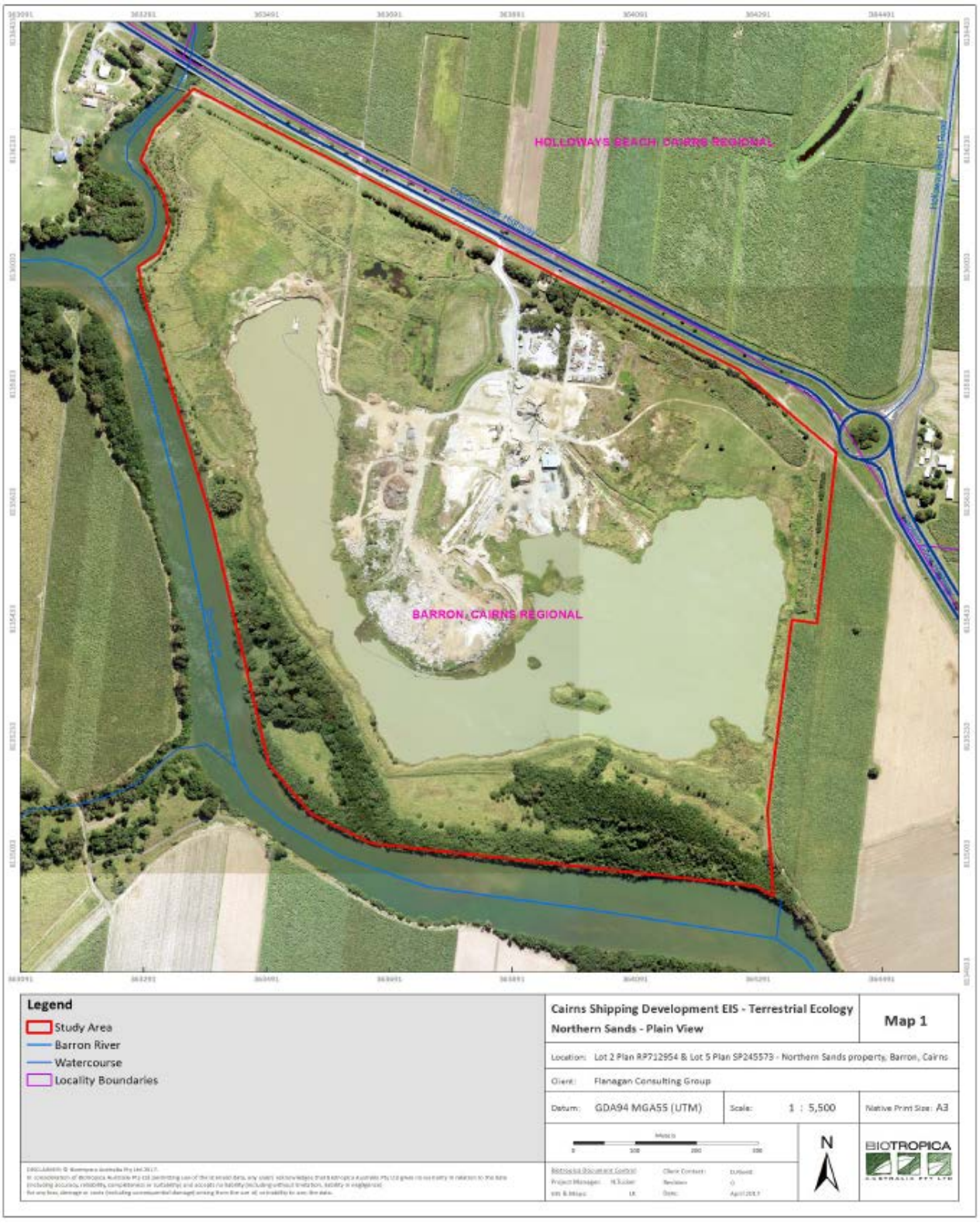



**Figure B19-8** Northern Sands DMPA.

**Source: Appendix AM**.

The site occurs on an alluvial substrate with high silt / sand content at low elevations, with the exception of the modified portions which consist of sand soils. Any variation to topography at the site is man-made and relates to the voids from previous and on-going sand extraction and waste / stockpile areas. Within the mangrove communities bordering the river, minor undulations occur which shape the tidal channels. These channels, along with the banks of the river, consist of mud soils with poor drainage. On areas of higher relief, organic matter increases and soils becomes better drained allowing establishment of a more diverse range of species and life forms.

The Northern Sands DMPA is largely surrounded by disclimax vegetation, sugar cane, cultivation and industrial development. The highly disturbed and ecologically isolated nature of the site suggests it retains minimal natural values and makes a minimal contribution to nature conservation within the local landscape.

The remnant riparian vegetation along the Barron River provides a semblance of ecological connectivity. These forests are loosely connected through a very narrow (<10 m wide) riparian strip to the remaining fringing mangroves of the Barron River and to the adjacent Richters Creek and Thomatis Creek systems.

The likely end use of this site irrespective of the CSD Project is described in **Section B19.3.3.a**.

**Northern Sands Pipelines**

Inlet Pipeline

Soft clays will be delivered from the dredger via a submerged steel delivery pipeline, which will make landfall at the mouth of Richters Creek. From here the delivery pipeline will run overland (above ground) in a south-westerly direction, initially through and existing clearing within Corymbia/Melaleuca woodland, then through anthropogenic grassland of the Pappalardo farm to cross Richters Creek before again extending across cane fields west of Holloways Beach. The delivery pipeline will pass through an existing culvert under the Captain Cook Highway and then westwards to enter the northern end of Lake Narelle. The delivery pipeline will require three terrestrial booster pumps and laydown areas prior to and during construction (see **Figure B19-9**).

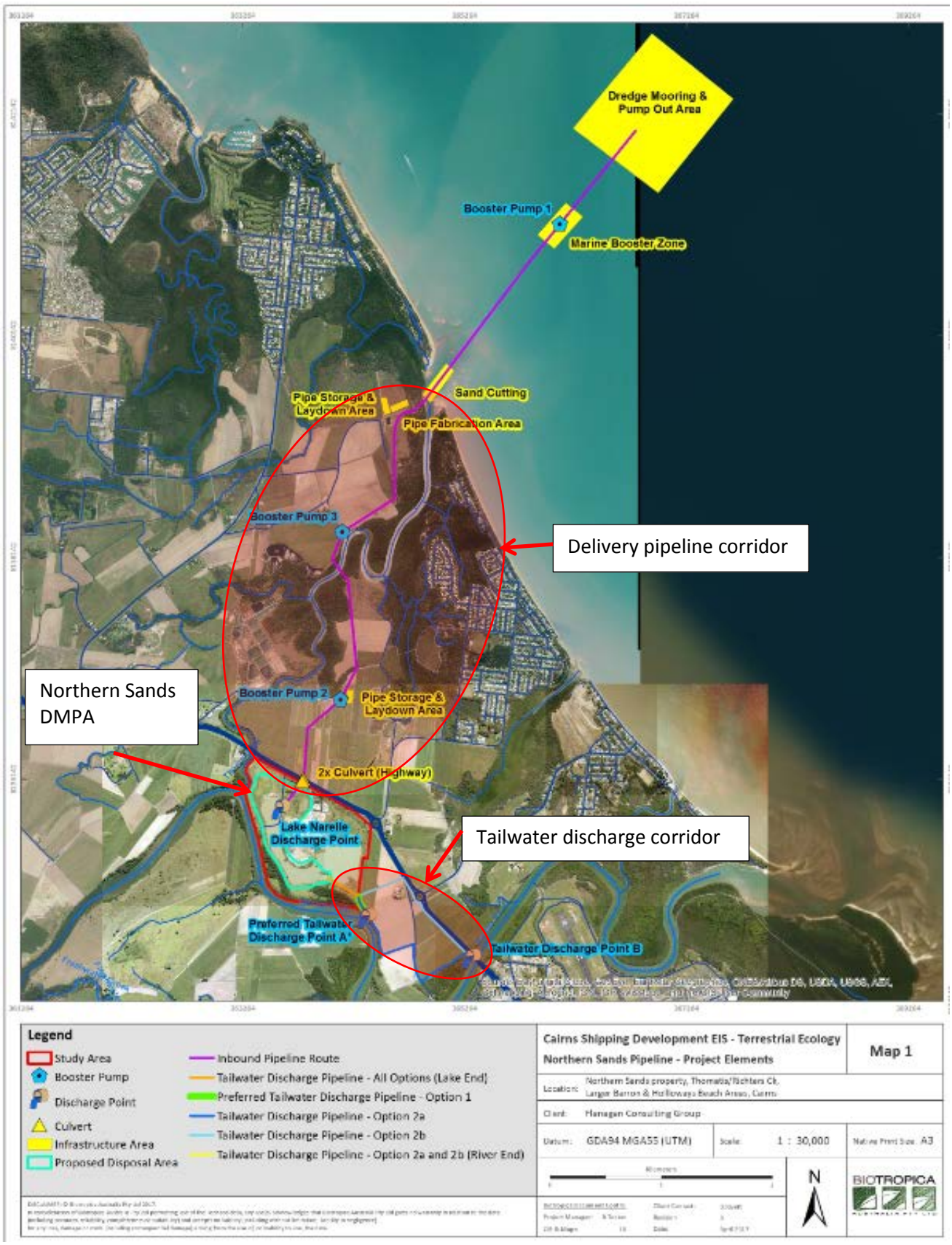



**Figure B19-9** Northern Sands DMPA and pipelines.

**Source: Appendix AM** with added labels. The crossing of the mouth of Richters Creek is referred to above as a 'sand cutting' although the final construction methodology has not been confirmed.

The pipeline will cross Richters Creek between Booster Pump 1 and Booster Pump 2 shown on **Figure B19-9** above.

Tailwater Discharge Pipeline(s)

Tailwater decanted from the placement operation will be discharged from Lake Narelle via one of three options (see **Figure B19-9** above):

- Discharge Site A* is located to the southeast of the Northern Sands study area and accessed via Discharge Route 1. It is located on anthropogenic grassland in the south-east of the DMPA, proceeding onto agricultural land adjacent to mangroves fringing the Barron River. The discharge point A* has been sited to be located in a cleared area in the fringing mangroves associated with the Barron River and it is expected to be possible to micro-locate the pipeline to be clear of mangrove vegetation.
- Discharge Site B is located adjacent to the northbound Captain Cook Highway bridges and is accessed via either Discharge Pipeline Option 2A which runs via agricultural land, or Pipeline Option 2B which runs adjacent to the Bruce Highway.
  - Option 2a: This route follows anthropogenic grassland in the south-east of the DMPA, proceeding onto agricultural land adjacent to the mangroves fringing the Barron River. It then crosses agricultural land and co-joins with Option 2b close to discharge point B. It is expected to be possible to micro-locate the pipeline to be clear of mangrove vegetation.
  - Option 2b: This route exits the DMPA site at the Holloways Beach roundabout and follows the western road verge of the Captain Cook Highway towards the northbound lane of the Barron River Bridge. The majority of the pipeline route is vegetated with common roadside exotic grasses and forbs including; purple-top Rhodes grass (*Chloris inflata*), wiry love grass (*Eragrostis tenuifolia*), navua sedge (*Cyperus aromaticus*), calopo (*Calopogonium mucunoides*) and sensitive weed (*Mimosa pudica*). This pipeline route should not encounter any remnant vegetation.

Modelling (see **Chapter B5** (Marine Water Quality)) concludes that Discharge Site B is preferred.

### B19.4.2.d Tingira Street DMPA

The Tingira Street study area located on Lot 27 on SP218291 located at the end of Tingira Street in Portsmith. The DMPA consists of two separate sites (see **Figure B19-10**). The DMPA is set within an urban industrial landscape to the north, but bordering areas of ecological value to the east, south, and west. The site represents the furthest extent of urban intrusion associated with the southern industrial area of Cairns into the natural landscape of Trinity Inlet and associated lands.

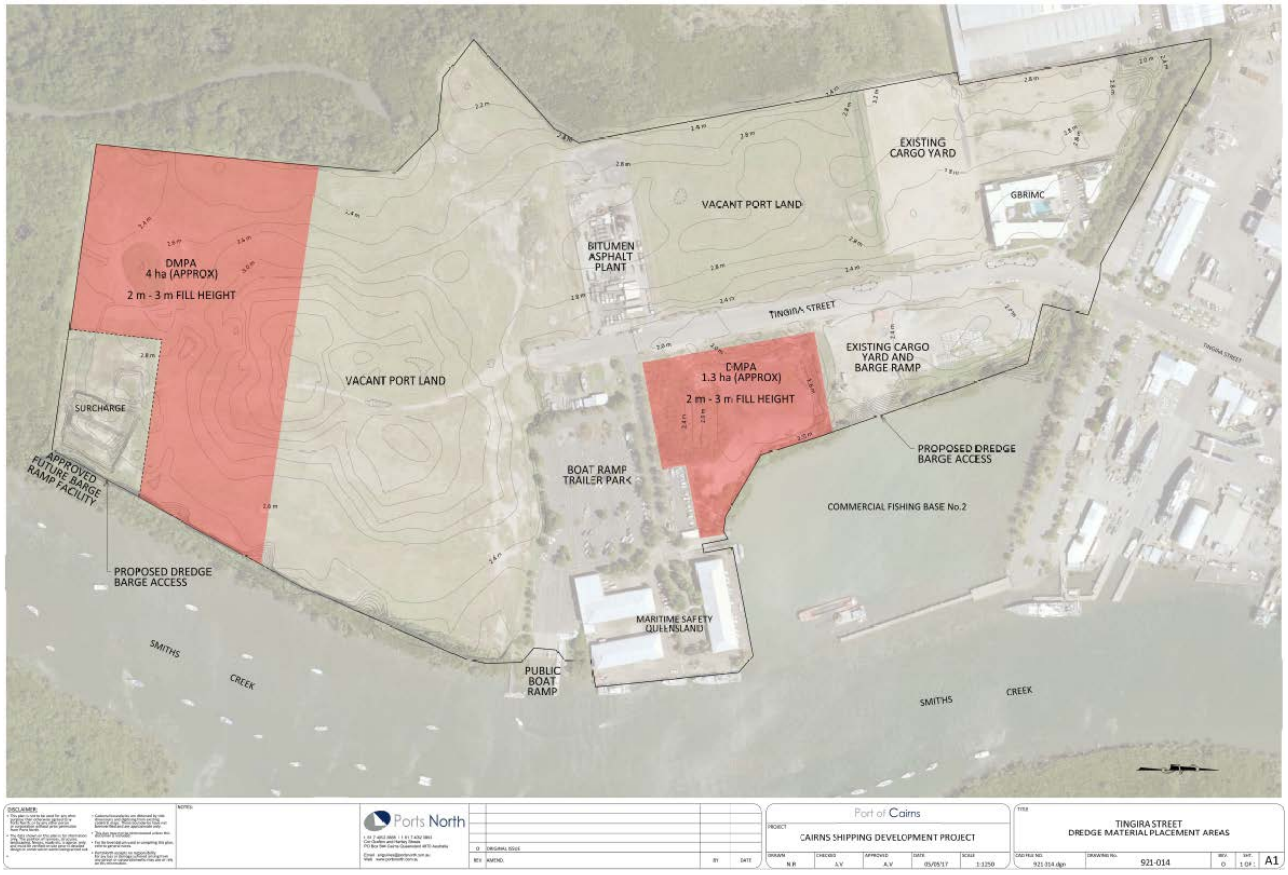



**Figure B19-10** Tingira Street DMPA.

**Source:** Ports North. DMPA (two individual placement areas shaded).

Prior to 1982, the Tingira Street site was a mangrove wetland. In 1982 a bund was constructed around the portion of the site west of the present Tingira Street alignment. After construction of the bund some mangroves were cleared and about 0.5 m of dredged material from Commercial Fisherman's Base No 2 was hydraulically placed within the bunded area.

In the late 1980s the remainder of the site was cleared of mangroves and imported quarry fill was placed to form and surcharge the proposed alignment of Tingira Street and the area of the proposed Harbours and Marine Base. Excess material from the surcharge was later used as fill in adjacent areas of the site.

From the early 1990s the Cairns Port Authority (now Ports North) began to accept small amounts of soil and pavement materials at the site from the Cairns City Council and building contractors. The Port Authority is also understood to have entered into agreements with several demolition contractors to accept demolition wastes (e.g. concrete rubble and soils). The majority of filling at the site is understood to have occurred between 1994 and 1996.

From around 2008 various parts of the site were surcharged to accelerate settlement, with some areas subsequently being developed.

The DMPA contains two parts described below as Site 1 (the southern area) and Site 2 (the northern area). These are shaded on **Figure B19-10** above.

**Site 1 – Anthropogenic Grassland (4 ha)**

The vegetation community present on Site 1 is a highly disturbed anthropogenic (man-made) grassland. Exotic species e.g., para grass (*Urochloa mutica*), Guinea grass (*Megathyrsus maximus var. maximus*) and navua sedge (*Cyperus aromaticus*) dominate. Native species are rare and are confined to the eastern boundary which borders the remnant mangrove vegetation. The topography is relatively flat with the exception of some

low-lying areas to the south and east where recent rainfall had created swampy areas, which were inundated at the time of survey (these wet areas were solely due to heavy rain in the days preceding the March 2017 survey and are transient in nature).

As described in **Section B19.3.3.e**, this site has been earmarked for industrial development irrespective of the CSD Project.

**Site 2 – Industrial Area (2.3 ha)**

The majority of the DMPA comprises remnants of the site's industrial past. The anthropogenic clearing and deposition of waste material has resulted in non-remnant vegetation with varying levels of weed invasion. The street boundaries of the property to the south and east are dominated by exotic species e.g., leucaena (*Leucaena leucocephala*) and Guinea grass (*Megathyrsus maximus var. maximus*).

However, much of the interior of the site consists of a man-made clearing which is undergoing natural regeneration to a wetland ecosystem with marine plants recruiting over most of the area. This regeneration will not continue to occur as the site has been earmarked for industrial development irrespective of the CSD Project as described above.

## B19.4.3 Reliability of Information

The EIS guidelines require that for information given, the EIS must state:

- (a) the source of the information; and
- (b) how recent the information is; and
- (c) how the reliability of the information was tested; and
- (d) what uncertainties (if any) are in the information.

Then technical work that underpins the Revised Draft EIS generally falls into the following categories:

- Peer reviewed literature/collections comprising journals, books, book chapters, technical notes, PhD/MSc thesis, herbarium and museum records, and the date of publication/collection is provided in the various references list. It is assumed that any flaws in this literature/collection records have been exposed and where available more reliable or up to date information is used.
- Commonwealth/State/Local Government data including GIS and other spatial data, Recovery Plans, herbarium and museum records and published guidelines. It is assumed that this data would have been subjected to internal and/or external review. The veracity and currency of this data is not questioned.
- Grey literature including consultant's reports, generally unpublished. Documents are generally prepared for scrutiny by the Regulator, so would be expected to reflect a degree of scientific rigour. However, no assumptions are made regarding the veracity of this information class, except where this data:
  - has been collected specifically to meet the requirements of this Revised Draft EIS document (and is presented in this document)
  - relates to an internal/client document.
- Original information collected by the study team (e.g. field data on communities, species, environmental parameters on air, noise, water, coastal and marine processes).
- Processed data (e.g. analyses or modelled using industry approved tools and techniques). The modelling work was specifically peer reviewed in accordance with the EIS Guidelines.
- Reference to technical and industry experts (e.g. representatives from a range of state and federal government departments, academics, dredging contractors, and local business operators).
- The revised draft EIS references reports and studies from the Draft EIS which was accepted for public release by the OCG as meeting the guidelines (including this requirement).

References throughout the Revised Draft EIS have been assessed in line with (a) to (c) above. Uncertainties are also noted (usually in terms of data gaps).

# B19.5 Impact Assessment Framework

## B19.5.1 Introduction

### B19.5.1.a Marine Matters

As noted in the December 2016 DoEE email (**Section B19.1.2.d**), a number of critical reports have been completed since the finalisation of the EIS guidelines. Of these, the most relevant are the Great Barrier Reef Region Strategic Assessment undertaken by GBRMPA (2014a) addressing the marine environment and the associated Program Report (GBRMPA 2014b).

These two reports together provide for review and assessment of the effectiveness of management arrangements at protecting the GBR's World Heritage values as well as many other matters of NES which are afforded protection under the EPBC Act. The goal is to help identify, plan for and manage existing and emerging risks to the unique environmental values of the matters of NES relevant to the GBR coastal zone. The GBRMP documents also provide a comprehensive statement of the values of the GBRWHA and current threats to these values. The study area includes the Queensland coastal zone (defined as Queensland coastal waters, islands, and inland areas to a distance of five kilometres or the 10 metre AHD contour, whichever is further) and Commonwealth waters to the edge of the continental shelf.

While these reports are most applicable to the discussion on the GBRWHA, they also have some relevance to other matters of NES and for both direct and indirect impacts. Accordingly, they have been used or adapted as an appropriate impact assessment framework for the CSD Project.

In addition, a risk-based impact assessment methodology has been undertaken for the CSD Project as outlined in **Chapter A1** (Introduction). This follows the principles of the national standard for risk management (AS/NZS ISO 31000:2009 Risk management—Principles and guidelines). This is described in detail in **Chapter B17** (Hazard and Risk) and summarised in **Section B19.5.5**. This is not incompatible with that used in the strategic assessment but requires separate treatment for compatibility with the Revised Draft EIS as a whole.

### B19.5.1.b Terrestrial Matters

Specific assessment criteria are applied to terrestrial MNES as detailed in **Chapter B8** (Terrestrial Ecology) and as referred to below where relevant. In general this follows the risk-based impact assessment methodology described above.

## B19.5.2 Strategic Assessment of the GBR Region

GBRMPA (2014a) provides a wealth of useful information on values and threats to Matters of NES relevant to the GBR and in particular sets the scene for a region-wide assessment of Outstanding Universal Value (OUV) which underpins World Heritage values. The concept of OUV is explored in detail in **Section B19.6.1.b**. The GBRMPA report also provides a structure for assessing a development at a specific location within the context of the Great Barrier Reef region as a whole.

**Table B19-7** sets out the key to references to GBRMPA (2014a, b).

**TABLE B19-7 KEY REFERENCES TO GBRMPA (2014A AND 2014B)**

| REFERENCE | DETAILS | USE | SECTION OF REVISED DRAFT EIS |
|---|---|---|---|
| Figure 4.3 | Spatial distribution of matters of NES | Explanation of spatial aspects on matters of NES | **Section B19.1.4.b** |
| Figure 1.4 | Local boundaries of the GBR region, the GBRWHA, and the GBRMP | Explanation of boundaries relevant to controlling provisions | **Section B19.1.4.b** |
| Section 6.1.3 | Definition of types of impacts (e.g. direct, consequential, cumulative) | Discussion of types of impacts | **Section B19.1.4.c** |
| Table 6.1 | List of impacts and scale (i.e. local to reef-wide) | Checklist of impacts for all uses and associated scale | **Section B19.1.4.c** |
| Table 6.2 | Impacts and their sources – allocation of Table 6.1 impacts to specific land uses | Impact screening for 'urban development' and 'tourism' | **Section B19.1.4.c** |
| Table 4.1 | Comparison of original and current World Heritage criteria | Details of original and current World Heritage criteria and associated references | **Table B19-14** |
| Table 4.8 | Key values and attributes of matters of NES | Key values and attributes (listing criteria and integrity) | **Table B19-15** |
| Table 4.9 | Key environmental processes relevant to matters of NES | Key environmental processes (listing criteria and integrity) | **Table B19-16** |
| Table 7.11. | Examples of OUV | Impacts on OUV | **Table B19-17** |

**Source:** Study team compilation. All references are to GBRMPA (2014a) unless noted by asterisk (*) – in this case they refer to GBRMPA (2014b).

While **Table B19-7** highlights the main references to the strategic assessment report, many other references are also relevant and these are discussed in the balance of this chapter. The assessment puts the CSD Project into the context of the GBR as a whole, considering the comprehensive links between high-level listing criteria, the values upon which these are based, and the likely impacts. At the site level, this context is essential.

## B19.5.3 Types of Impacts

Various types of impacts on matters of NES are relevant (SEWPaC n.d.):

- **Direct impacts** may include for example direct clearing of vegetation and habitat, construction of buildings and impacts to water quality through runoff.
- **Indirect and/or consequential impacts** may include, but are not limited to, the risk of weed invasion, pollution, noise, increased boat strike on marine fauna and increased impacts from recreational activities, such as fishing. The department may also consider road upgrades and supporting water and power infrastructure and the possibility that urban development and population growth may be encouraged in the surrounding region as a result of the proposed development. Consideration may also be given to changes to the shoreline as a result of land reclamation.
- **Cumulative impacts** which may be considered include coastal development (including habitat loss and degradation, and underwater noise) and changing landscape character, catchment runoff (creating greater accumulation of toxins and bacteria), climate change impacts such as extreme weather events and the combined effects of the proposed development in light of these.

The above definitions are consistent with those adopted by in the strategic assessment of the GBR (GBRMPA 2014a):

- **Direct impacts** — where the loss or modification of values is a direct result of an action within the strategic assessment area (for example, dredging and disturbing wildlife). Indirect impacts — can be either:
  - from actions outside the strategic assessment area with 'downstream' effects in the area (for example, modifying supporting terrestrial habitats, urban and industrial discharge)
  - as a result of another direct impact (for example, an oil spill resulting from the grounding of a ship).
- **Consequential impacts** — where the impact arises from an action made possible by an initial direct impact (for example, anchor damage from ships now able to visit an area after dredging).
- **Cumulative impacts** — the successive and combined effects of impacts on the environment, taking into account direct, indirect and consequential impacts and the incremental and compounding effects of these impacts over time.

While the focus of GBRMPA approach is on the GBR, the same framework can be applied to terrestrial matters. An assessment against these categories is provided in **Table B19-15** and **Table B19-16** and the associated subsequent text. This Revised Draft EIS includes a specific assessment of cumulative (and consequential) impacts in **Chapter B18** (Cumulative Impacts Assessment). There is some unavoidable overlap between that chapter and this EPBC Act issues discussion. Even though each includes a summary of matters described in detail in the other, it is suggested that readers refer to both.

In the following screening of impacts, reference is made to the proposed environmental framework outlined in **Table B19-6**.

### B19.5.4 Impact Screening

**Chapter B18** (Cumulative Impacts Assessment) uses GBRMPA's strategic assessment as a framework to identify the likely impacts that could occur in the CSD Project Study Area (at the local, Regional, and Reef-wide scales as appropriate) due to both the project itself and other relevant projects / activities. These were further screened into 'packages' that apply to CSD Project-specific impacts associated with:

- dredging of the channel and swing basin
- placement on land at the two DMPAs
- shipping (i.e. relevant to the cruise vessels).

The following is a copy of Table 18-3 from **Chapter B18** (Cumulative Impacts Assessment (CIA)). In this table:

- the first three columns are derived from GBRMPA (2014a) Table 6.1, 6.2 and 6.11 for various levels of effect of impact on attributes: VH = Very High, H = High, L = Low.
- 'Maximum value' is the highest value shown for the 'Effect of Impacts on Region's Attributes' derived from GBRMPA (2014a) Table 6.11
- an 'x' in the 'CSD Project Element' columns signifies that the impact is relevant to that project element and therefore the Cumulative Impacts Assessment).

**TABLE B19-8 CUMULATIVE IMPACTS FOR ASSESSMENT**

| ABBREVIATED TITLE | IMPACT | SCALE | Maximum value | CSD Project element | | |
|---|---|---|---|---|---|---|
| | | | | Dredging | DMPA | Shipping |
| Coastal reclamation | Coastal land reclamation, including for ports and groynes | Local | H | | Note 1 | |
| Dredging | Dredging of the seafloor | Local | V | x | | |
| Exotic species and diseases | Introduction of exotic species and diseases from aquaculture operations, hull fouling, ballast release, imported bait and release of aquarium specimens to the Region, plus the introduction of weeds and feral animals to islands | Regional | H | | | x |
| Marine debris | Manufactured material discarded, disposed of or abandoned in the marine and coastal environment (including discarded fishing gear and plastics) | Reef-wide | H | x | | x |
| Modifying supporting terrestrial habitats | Clearing or modifying supporting terrestrial habitats such as wetlands, saltmarshes, mangroves and sand dunes — this also includes trampling and damage from recreational vehicle use | Regional | H | | x | |
| Physical damage — ship grounding | Grounding of ships including physical damage and the dislodging of antifoulants | Local | V | | | x |
| Sediments from catchment run-off | Sediments entering the Region in run-off from the catchment | Reef-wide | V | | x | |
| Vessel strike on wildlife | Death or injury to wildlife as a result of being struck by a vessel of any type or size | Local | H | x | | x |

**Source: Chapter B18** (Cumulative Impacts Assessment) Table 18-3.

Legend (effect of impact on attributes): VH = Very High, H = High, L = Low.

Note 1: As discussed in **Chapter B18** (Cumulative Impacts Assessment), the filling works at the Tingira Street DMPA are better described under 'Modifying supporting terrestrial habitats'.

This table provides the basis of the CIA and each impact is assessed in detail. However, it is also a useful checklist for this chapter.

## B19.5.5 EIS Impact Assessment Methodology

### B19.5.5.a Risk-based Assessment

While the impact assessment methodology described above is useful for marine matters, for consistency with other chapters of this Revised Draft EIS, it is also relevant to refer the risk-based impact assessment methodology as outlined in **Chapter A1** (Introduction). This follows the principles of the national standard for risk management (AS/NZS ISO 31000:2009 Risk management—Principles and guidelines). This is described below with respect to:

- the magnitude of impacts (consequence)
- the duration of impact
- the likelihood of impact.

In simple terms risk is defined as the product of likelihood and consequence. These are considered together to determine the final level of impact risk.

A detailed discussion on the key principles of risk is included in **Chapter B17** (Hazard and Risk).

### B19.5.5.b Impact Consequence Criteria

Impact consequence criteria are different for each matter under discussion. **Table B19-9** shows the criteria used for this chapter.

**TABLE B19-9 IMPACT CONSEQUENCE CRITERIA**

| Impact Consequence | Description of Consequence |
|---|---|
| Very High | The impact is considered critical to the decision-making process.<br>Value/s of a World Heritage property suffer/s permanently damaged serious or irreversible environmental damage to the extent that the area requires reclassification, or where value/s is/are permanently lost (e.g. if the OUV of the GBRWHA suffered serious or irreversible environmental damage or a key attribute underpinning listing of the site is lost or permanently modified).<br>Irreversible or long-term (i.e. greater than decades) loss or diminishment of important habitats or communities that lead to major flow on effects to biodiversity values and ecosystem functioning at a regional (Cairns wide) scale.<br>Severe impacts to populations of listed threatened species, such that their capacity to reproduce and recover is significantly affected. |
| High | The impact is considered likely to be important to decision-making.<br>Impacts tend to be permanent or irreversible or otherwise long to medium term. Impacts can occur over large or medium scale areas.<br>High to moderate sensitivity of environmental receptors to impact (e.g. fragmentation or partial loss of populations of EPBC listed threatened flora or substantial loss of OUV).<br>Mortality of a several individuals of internationally/nationally threatened species, but no detectable change to population status or the capacity of populations to recover. |
| Moderate | The effects of the impact are relevant to decision-making including the development of environmental mitigation measures.<br>Impacts can range from long term to short term in duration.<br>Impacts can occur over medium scale areas or otherwise represents a significant impact at the local scale.<br>Moderate sensitivity of environmental receptors to impact (e.g. removal or significant reduction in the extent of suitable habitat assessed as 'high suitability' for EPBC listed threatened flora across the site).<br>Loss of several individuals, or temporary loss of life history function for threatened species, or species of high fisheries or otherwise ecological value, but no detectable change in their population status at local (study area and surrounds) spatial scales (e.g. once off interruption of breeding or spawning, not necessarily affecting all of local population). |
| Minor | Impacts are recognisable / detectable but acceptable.<br>These impacts are unlikely to be of importance in the decision making process. Nevertheless, they are relevant in the consideration of standard mitigation measures.<br>Impacts tend to be short term or temporary and /or occur at local scale (e.g. reduction in the extent of suitable habitat assessed as 'high suitability' for EPBC listed threatened flora across the site, however replacement habitat will be provided).<br>Short term (i.e. duration of dredge campaign, less than one year) changes to the distribution of threatened species or species of high fisheries significance (i.e. avoidance of areas), but no long-term effects to local population status. |
| Negligible | Minimal change to the existing situation. This could include, for example, impacts which are beneath levels of detection, impacts that are within the normal bounds of variation, or impacts that are within the margin of forecasting error. |
| Beneficial | Impacts have a positive outcome on the existing situation. This could include, for example, an improvement in integrity. |

**Table B19-10** shows the general approach to classifying the duration of identified impacts.

**TABLE B19-10 CLASSIFICATIONS 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 five years |
| Long Term | From five to 50 years |
| Permanent / Irreversible | In excess of 50 years |

### B19.5.5.c Likelihood of Impact

Likelihood of impact is described in **Table B19-11** below.

**TABLE B19-11 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 |

### B19.5.5.d Risk Matrix

Risk is described as the product of likelihood and consequence as shown in **Table B19-12** below.

**TABLE B19-12 RISK MATRIX**

| Likelihood | Significance | | | | |
|---|---|---|---|---|---|
| | Negligible | Minor | Moderate | High | Very high |
| Highly Unlikely/ Rare | Negligible | Negligible | Low | Medium | High |
| Unlikely | Negligible | Low | Low | Medium | High |
| Possible | Negligible | Low | Medium | Medium | High |
| Likely | Negligible | Medium | Medium | High | Extreme |
| Almost Certain | Low | Medium | High | Extreme | Extreme |

### B19.5.5.e Risk Rating

The rating of risk as assessed above is as shown in **Table B19-13** below.

**TABLE B19-13 RISK RATING LEGEND**

| | |
|---|---|
| Extreme Risk | An issue requiring change in project scope; almost certain to result in a 'significant' impact on a Matter of National or State Environmental Significance (including OUV and integrity) |
| High Risk | An issue requiring further detailed investigation and planning to manage and reduce risk; likely to result in a 'significant' impact on a Matter of National Significance (including OUV and integrity) |
| 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 |

### B19.5.5.f Mitigation

Throughout this chapter comment is made regarding the need or opportunity for mitigation. Mitigation can also be thought of as 'risk treatment'. The national standard for risk management is AS/NZS ISO 31000:2009 Risk management—Principles and guidelines. AS/NZS ISO 31000:2009 defines risk treatment as a 'process to modify risk'. It notes that risk treatment can involve:

- avoiding the risk by deciding not to start or continue with the activity that gives rise to the risk
- taking or increasing risk in order to pursue an opportunity
- removing the risk source
- changing the likelihood
- changing the consequences
- sharing the risk with another party or parties (including contracts and risk financing)
- retaining the risk by informed decision.

It also notes that:

- Risk treatments that deal with negative consequences are sometimes referred to as 'risk mitigation', 'risk elimination', 'risk prevention' and 'risk reduction'.
- Risk treatment can create new risks or modify existing risks.

Recommended mitigation strategies are described below for each relevant matter (those with negligible risks or outside the scope of this report are no longer considered), along with an assessment of the effect of mitigation on risk level. Risks that are unable to be mitigated are also discussed.

The mitigation measures proposed throughout this chapter have been applied in a number of projects of similar scale, intensity and duration within the greater Cairns area. All of these mitigation measures are considered appropriate and likely to be effective in countering the associated impacts.

# B19.6 World Heritage Properties - GBR

## B19.6.1 Presence of Matter

### B19.6.1.a Overview

The Protected Matters Search Tool (**Appendix BD**) reveals that the Great Barrier Reef World Heritage Area (GBRWHA) is within the designated search area.

In the vicinity of the project area the GBRWHA lies seaward of low water – although the WHA includes all internal waters of the state. Refer to **Figure B19-4**. Regarding the various Project Areas:

- Main Channel and the dredge mooring and pump out point at the seaward end of the delivery pipeline to the Northern Sands DMPA: lies entirely within the WHA.
- Northern Sands Project Area: the WHA runs up the Barron River to just opposite the south-west corner of the site (approximately 16.863085° S 145.718511°W). The delivery pipeline crosses the WHA at the mouth of Richters Creek and again near the confluence of Richters Creek and Thomatis Creek. See **Figure B19-11**.
- Tingira Street Project Area: the WHA runs immediately adjacent to the site at low water. See **Figure B19-12**.

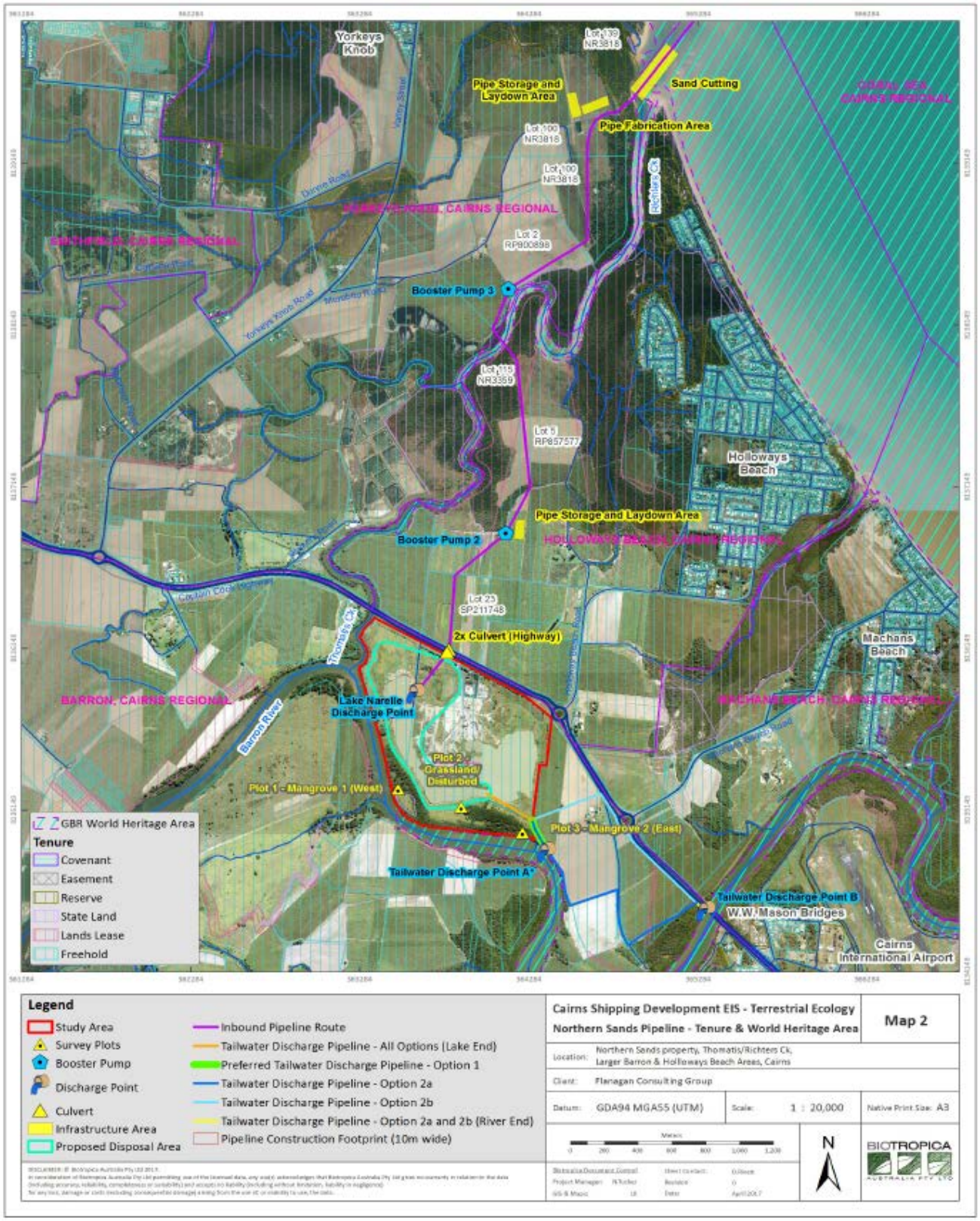



**Figure B19-11** GBRWHA in the vicinity of the Northern Sands Project Area.

**Source: Appendix AM**. The crossing of the mouth of Richters Creek is referred to above as a 'sand cutting' although the final construction methodology has not been confirmed.


**Figure B19-12** GBRWHA in the vicinity of the Tingira Street Project Area.

**Source: Appendix AM**. See comment regarding mapping errors below.

**Appendix AM** notes that the boundary of the GBRWHA is located in the centre point of Smiths Creek which is adjacent to the eastern boundary of the Tingira Street DMPA as shown above. The location of the GBRWHA boundary in the middle of the creek may be a mapping error due to the scale of the mapping. It is assumed that the whole of Smiths Creek to low water is deemed as GBRWHA.

### B19.6.1.b Outstanding Universal Value

As a WHA, the GBRWHA is recognised under the World Heritage Convention as having Outstanding Universal Value (OUV). According to the then Department of the Environment's *EPBC Act referral guidelines for the Outstanding Universal Value of the Great Barrier Reef World Heritage Area* (Department of the Environment 2014), World Heritage properties are matters of national environmental significance under the EPBC Act, and all World Heritage properties have Outstanding Universal Value. The concept of OUV underpins the World Heritage Convention which:

> … provides the basis for listing properties on the World Heritage List and protecting and managing World Heritage properties. Broadly, the meaning of Outstanding Universal Value follows the common sense interpretation of the words:
>
> - Outstanding: For properties to be of outstanding universal value they should be exceptional, or superlative – they should be the most remarkable places on Earth.
> - Universal: Properties need to be outstanding from a global perspective. World Heritage does not aim to recognise properties that are remarkable from solely a national or regional perspective. Countries are encouraged to develop other approaches to recognise these places. Australia does this through National Heritage listing.
> - Value: What makes a property outstanding and universal is its 'value', or the natural and/or cultural worth of a property. This is based on standards and processes established under the World Heritage Convention's Operational Guidelines.' (p4).

The Operational Guidelines for the Implementation of the World Heritage Convention (UNESCO 2012) define the concept of OUV as 'cultural and/or natural significance, which is so exceptional as to transcend national boundaries and to be of common importance for present and future generations of all humanity.' The Great Barrier Reef has OUV and has been World Heritage-listed because it meets all four of the natural environment criteria. According to GBRMPA (2014a), recognition of the Great Barrier Reef's outstanding universal value was based on the natural world heritage criteria in place at the time — acknowledging the Reef's natural values, together with the strong ongoing links between Aboriginal and Torres Strait Islanders and their sea country.

The criteria have been amended and renumbered since the Reef was inscribed. See **Table B19-14** below.

**TABLE B19-14 COMPARISON OF ORIGINAL AND CURRENT WORLD HERITAGE CRITERIA**

| Short title | Criteria at time of listing (1981) | Current criteria (>2008) |
|---|---|---|
| Major stages of the Earth's evolutionary history | (i) outstanding examples representing the major stages of the earth's evolutionary history | (viii) be outstanding examples representing major stages of earth's history, including the record of life, significant on-going geological processes in the development of landforms, or significant geomorphic or physiographic features; |
| Ecological and biological processes | (ii) outstanding examples representing significant ongoing geological processes, biological evolution and man's interaction with his natural environment | (ix) be outstanding examples representing significant ongoing ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals; |
| Natural beauty and phenomena | (iii) unique, rare or superlative natural phenomena, formations or features or areas of exceptional natural beauty, such as superlative examples of the most important ecosystems to man | (vii) contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance; |
| Habitats for conservation of biodiversity | (iv) habitats where populations of rare or endangered species of plants and animals still survive | (x) contain the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation. |

**Source:** GBRMPA (2014a) Table 4.1.

Only those values, or attributes, that are consistent with the four criteria for which the Great Barrier Reef was inscribed (i.e. the 1981 criteria in the second column above) can be considered to be its world heritage values. However, given the broad scope of the criteria under which it was listed, almost all aspects of the Reef's environment contribute to its outstanding universal value. This includes the Region's biodiversity, geomorphological features, aspects of Traditional Owner connections to the area, its environmental processes, and its aesthetic value. The notable exception is historic heritage values (for example, shipwrecks and light houses etc.) which are not encompassed by the natural criteria but are protected within the GBRMP.

The attributes that contribute to the property's outstanding universal value are interconnected and are distributed across the entire extent of the property.

A Statement of the Outstanding Universal Value of the Great Barrier Reef World Heritage Area (SOUV) is the official statement adopted by the World Heritage Committee outlining how the property met the criteria for outstanding universal value, integrity, and protection and management at the time of listing. The statement was prepared retrospectively. In line with International Union for Conservation of Nature (IUCN) guidelines, the statement is based on information that was available in 1981 and addresses the criteria in place at the time of inscription.

### B19.6.1.c Integrity

In addition to meeting at least one of the ten criteria to be considered of outstanding universal value, a World Heritage property also needs to meet conditions of integrity. SEWPaC (n.d.) describes integrity as relating to the 'wholeness and intactness' of the property as at the time of inscription and how it conveys the values it holds. Integrity can also relate to the size of the property (is it of sufficient size to continue to represent the values?) and to any threats affecting the property (is it likely that the values will be significantly degraded?).

The GBRWHA meets the condition of integrity, namely:

- the property includes all elements necessary to express its outstanding universal value
- is of adequate size to ensure the complete representation of the features and processes which convey the property's significance
- is protected from threats.

In interpreting the values of the GBRWHA for the purposes of impact assessment of a particular development, it is necessary to determine what values are present in the area likely to be impacted by the development and assess the quantum of these impacts. With a property as extensive as the GBRWHA not all values are present in all areas. However, it is important to recognise that OUV are distributed throughout the World Heritage property as explained by the concept of 'wholeness and intactness' described above. Therefore, impacts can be expected to be felt some distance from a development site in some cases.

### B19.6.1.d Property Level Values

Notwithstanding the concepts of 'wholeness and intactness', it is appropriate to examine specific values related to the listing criteria of the property as described above and inspect the contribution that the project site and its surrounds makes to OUV. The 'Guidelines' below have been extracted from the document 'Interim Guidelines on the Outstanding Universal Value of the Great Barrier Reef World Heritage Area - for proponents of Actions' (SEWPaC. n.d.). Impacts on these values are considered later in this report.

It is understood that the convention for describing criteria is to list them in the new order, refer to the original and new numbering, and refer to the original description as this is applicable for assessment. This convention has been followed below.

**Values**

The GBR strategic assessment (GBRMPA 2014a) includes a detailed checklist of key values and attributes of Matters of NES (Table 4.8). For the WHA these are based on the SOUV (SEWPaC 2012b) and cover the four listing criteria as well as integrity. The following table is a subset of Table 4.8 and deals with:

- the key values and attributes (Table 4.8 column 1)
- GBRMPA assessment of presence for the value at the GBR level (Table 4.8 columns 2 to 6) – columns 2, 4, 6, 8, and 10 below) shaded and marked 'G' = GBR
- study team assessment of presence for the value at the CSD Project site level (columns 3, 5, 7, 9, and 11 below) – unshaded and marked 'S' = (local scale) Study Area.

The study team assessment was based on the findings of **Chapter B7** (Marine Ecology).

This table therefore provides a checklist of those WHA values that are present at or in the immediate vicinity of the various project areas (or could potentially be influenced in some way by the CSD Project which is why the broader (local scale) Study Area is used) and these headings are used to structure the following discussion. Note that the order of columns 2, 4, 6, 8, and 10 follows that of the current listing criteria (i.e. (vii) to (x)), rather than the original criteria (i) to (iv) as was the case for the original table.

The symbol '~' indicates that the value is considered relevant at the local (site) level despite not being included in the original GBRMPA tables.

**TABLE B19-15 KEY WHA VALUES AND ATTRIBUTES AT GBR AND SITE LEVEL**

| Key values and attributes | Criterion vii | | Criterion viii | | Criterion ix | | Criterion x | | Integrity | |
|---|---|---|---|---|---|---|---|---|---|---|
| | G | S | G | S | G | S | G | S | G | S |
| **Biodiversity – GBR habitats** | | | | | | | | | | |
| Islands | • | | | | • | | • | | • | |
| Beaches and coastlines | • | • | | | | ~ | | • | • | • |
| Mangrove forests | • | • | | | | ~ | • | • | • | • |
| Seagrass meadows | | | | | | | • | • | • | • |
| Coral reefs (<30 m) | • | • | | | • | | • | • | • | • |
| Deeper reefs (>30 m) | • | | | | • | | • | | • | |
| Lagoon floor | | | | | | | • | • | • | • |
| Shoals | | | | | | | • | • | • | • |
| Halimeda banks | | | | | • | | | | • | |
| Continental slope | | | | | | | | | • | |
| Open waters | • | • | | | | ~ | • | • | • | • |
| **Biodiversity – terrestrial habitats that support the GBR** | | | | | | | | | | |
| Saltmarshes | | | | | | | | | | |
| Freshwater wetlands | | | | | | | | | | |
| Forested floodplain | | | | | | | | | | |
| Heath and shrublands | | | | | | | | | | |
| Grass and sedgelands | | | | | | | | | | |
| Woodlands | | | | | | | | | | |
| Forests | | | | | | | | | | |
| Rainforests | • | • | | | | | | | | |
| Connecting waterbodies | | | | | | ~ | • | • | • | • |
| **Biodiversity – species** | | | | | | | | | | |
| Mangroves | • | • | | | | | • | • | • | • |
| Seagrasses | | | | | | | • | • | • | • |
| Macroalgae | | | | | | | • | • | • | • |
| Benthic microalgae | | | | | | | • | • | • | • |
| Corals | • | • | | | | | • | • | • | • |
| Other invertebrates | | | | | • | • | • | • | • | • |
| Plankton and microbes | | | | | | | • | • | • | • |
| Bony fish | • | • | | | • | • | • | • | • | • |
| Sharks and rays | | | | | | | • | • | • | • |

| Key values and attributes | Criterion vii | | Criterion viii | | Criterion ix | | Criterion x | | Integrity | |
|---|---|---|---|---|---|---|---|---|---|---|
| | G | S | G | S | G | S | G | S | G | S |
| Sea snakes | | | | | | | • | • | • | • |
| Marine turtles | • | • | | | | | • | • | • | • |
| Estuarine crocodiles | | | | | | | • | • | • | • |
| Seabirds | • | • | | | | | • | • | • | • |
| Shorebirds | | | | | | | • | • | • | • |
| Whales | • | • | | | | | • | • | • | • |
| Dolphins | | | | | | | • | • | • | • |
| Dugongs | | | | | | | • | • | • | • |
| **Geomorphological features** | | | | | | | | | | |
| Coral reefs | • | • | • | • | | | | | • | • |
| Islands and shorelines | • | • | • | • | | | | | • | • |
| Channels and canyons | | | • | | | | | | • | |
| River deltas | | | • | • | | | | | • | • |
| Halimeda banks | | | • | • | | | | | • | • |
| Seagrass meadows | | | • | • | | | | | • | • |
| **Indigenous heritage** | | | | | | | | | | |
| Cultural practices, observances, customs and lore | | | | | • | | | | • | |
| Sacred sites, sites of particular significance, places important for cultural tradition | | | | | • | ~ | | | • | |
| Stories, songlines, totems and languages | | | | | • | ~ | | | • | |
| Indigenous structures, technology, tools and archaeology | | | | | • | | | | • | |
| **Historic heritage** | | | | | | | | | | |
| Places of historic significance — historic shipwrecks | | | | | | | | | | |
| Places of historic significance — World War II features and sites | | | | | | | | | | |
| Places of historic significance — lightstations | | | | | | | | | | |
| Places of historic significance — other | | | | | | | | | | |
| Places of scientific significance (research stations, expedition sites) | | | | | | | | | | |
| Places of social significance — iconic sites | | | | | | | | | | |
| **Community benefits of the environment** | | | | | | | | | | |
| Income | | | | | | | | | | |
| Employment | | | | | | | | | | |
| Understanding | | | | | | | | | | |
| Appreciation | • | • | | | | | | | | |
| Enjoyment | • | • | | | | | | | | |

| Key values and attributes | Criterion vii | | Criterion viii | | Criterion ix | | Criterion x | | Integrity | |
|---|---|---|---|---|---|---|---|---|---|---|
| | G | S | G | S | G | S | G | S | G | S |
| Access to reef resources | | | | | | | | | | |
| Personal connection | | | | | | | | | | |
| Health benefits | | | | | | | | | | |
| Aesthetics | • | • | | | | | | | • | • |

**Source:** Study team compilation. Key values and attributes and shaded columns (G) relate to the GBR and are extracted from GBRMPA (2013a) Table 4.8. Unshaded columns are the study team's assessments of presence in the CSD Project Study Area (local scale).

### Environmental Processes

The GBR strategic assessment (GBRMPA 2014a) includes a companion table to the above that investigates key ecological processes relevant to Matters of NES (Table 4.9). For the WHA these are based on the SOUV and cover the four listing criteria as well as integrity as above. The following table is a subset of Table 4.9 and deals with:

- the key environmental processes (Table 4.9 column 1)
- GBRMPA assessment of presence for the four listing criteria and integrity at the GBR level (Table 4.9 columns 2, 4, 6, 8, and 10) – shaded and marked 'G' = GBR
- study team assessment of presence for the four listing criteria and integrity at the CSD Project site level (columns 3, 5, 7, 9, and 11) – unshaded and marked 'S' = Site.

This table therefore provides a checklist of environmental processes relevant to WHA values that are present at or in the immediate vicinity of the CSD Project (or are likely to be influenced in some way by the project). These headings are used to structure the following discussion.

As above, the order of columns 2, 4, 6, 8, and 10 follows that of the current listing criteria (i.e. (vii) to (x)), rather than the original criteria (i) to (iv) as was the case for the original table.

**TABLE B19-16 KEY WHA ENVIRONMENTAL PROCESSES AT GBR AND SITE LEVEL**

| Key values and attributes | Criterion vii | | Criterion viii | | Criterion ix | | Criterion x | | Integrity | |
|---|---|---|---|---|---|---|---|---|---|---|
| | G | S | G | S | G | S | G | S | G | S |
| Waves, currents and tides | | | • | • | • | | | | • | • |
| Cyclones | | | • | • | • | • | | | • | • |
| Wind | | | • | | • | | | | • | |
| Sedimentation | | | • | • | • | | | | • | • |
| Sea level | | | • | • | • | | | | • | |
| Sea temperature | | | | | • | | | | • | |
| Light | | | | | • | | | | • | • |

| Key values and attributes | Criterion vii | | Criterion viii | | Criterion ix | | Criterion x | | Integrity | |
|---|---|---|---|---|---|---|---|---|---|---|
| | G | S | G | S | G | S | G | S | G | S |
| Nutrient cycling | | | | | • | | | | • | • |
| Ocean acidity | | | | | • | | | | • | • |
| Freshwater inflow and salinity | | | | | • | | | | • | • |
| Microbial processes | | | | | • | | | | • | • |
| Particle feeding | | | | | • | | | | • | • |
| Primary production | | | | | • | | | | • | • |
| Herbivory | | | | | • | | | | • | • |
| Predation | | | | | • | | | | • | • |
| Symbiosis | | | | | • | | | | • | • |
| Competition | | | | | • | | | | • | • |
| Connectivity | | | • | • | • | | | | • | • |
| Recruitment | | | | | • | | | | • | • |
| Reef building | • | | • | | • | | | | • | • |

**Source:** Study team compilation. Key environmental processes and shaded columns (G) relate to the GBR and are extracted from GBRMPA (2014a) Table 4.9. Unshaded columns are the study team's assessments of presence.

## B19.6.2 Summary of Residual Risk

**Table B19-17** below summarises the assessment of residual risk (i.e. following committed mitigation) on World Heritage values against relevant criteria and requirements set out in the Commonwealth's Referral Guidelines for OUV of the GBR World Heritage Area at a regional and local scale. The World Heritage criteria listed in the first column are described in **Table B19-14**.

This assessment has been consolidated from the findings of the following chapters of this Revised Draft EIS:

- **Chapter B2** (Nature Conservation Areas)
- **Chapter B5** (Marine Water Quality)
- **Chapter B7** (Marine Ecology)
- **Chapter B8** (Terrestrial Ecology)
- **Chapter B12** (Landscape and Visual).

**TABLE B19-17 SUMMARY OF RESIDUAL RISK ON GBRWHA – OUV**

| Relevant World Heritage Criterion | Attribute | Examples of this Attribute in the Local or Regional Study Area | Predicted risks of impact from these impacting processes (summarised from other EIS chapters) |
|---|---|---|---|
| vii, viii, ix | Islands | Green Island, Fitzroy Island, Double Island | Negligible – changes to coastal processes such as shoreline erosion, accretion and associated changes to island morphology are not expected from the project. |
| vii, x | Mangrove forests | Trinity Inlet, Admiralty Island, Mainland coastal areas | Low – predicted impacts on hydrodynamics, sedimentation rates and water quality are not expected to adversely affect mangroves in areas such as Trinity Inlet with rates and deposition levels well within the range of natural variability. |
| vii | Mangrove forests | Trinity Inlet, Admiralty Island, Mainland coastal areas | Negligible – visual intrusion by barge movements, pipeline construction (especially Richters Creek crossing) and operation of Tingira Street DMPA.<br>Negligible – visual intrusion from additional light glow from wharf and shipping activities. |
| vii, viii, ix, x | Hard coral communities | Double Island reefs, Green Island reefs Fitzroy Island reefs Mission Bay reefs | Low – Negligible (with mitigation) – water quality modelling predicts that coral communities are in the zone of influence of dredging and placement turbidity plumes but are not expected to be adversely impacted. |
| vii | Soft coral communities | Offshore soft coral communities (isolated and sparse) | Low – Negligible (with mitigation) – these communities are generally situated outside of direct impact zones (dredging footprint) and indirect water quality impacts are not expected to cause adverse impacts. |
| x | Seagrass meadows | Trinity Bay seagrass Trinity Inlet Seagrass at Double Island | Medium – Low (with mitigation) – seagrass is not presently found in the dredge footprint; water quality modelling predicts that adjacent seagrass areas are either in the zone of low to moderate impacts (immediately adjacent to the channel) or zone of influence but that dredging turbidity plumes are not expected to adversely impact these areas in terms of turbidity and sedimentation. A reactive monitoring programme will be implemented during the dredging to control impacts to these communities with corrective actions as outlined in **Chapter C2** (Dredge Management Plan). |

(Continued over)

| Relevant World Heritage Criterion | Attribute | Examples of this Attribute in the Local or Regional Study Area | Predicted risks of impact from these impacting processes (summarised from other EIS chapters) |
|---|---|---|---|
| ix | Diversity of benthic invertebrates (soft bottom benthos) | Soft bottom benthic environments within Trinity Bay | Low – unvegetated soft bottom benthic habitats will recover following disturbance by dredging (widening and deepening). Recovery will occur progressively but full recovery is not expected for periods of months (e.g 6 – 24 months) – short to medium term. |
| x | Cetaceans (dolphins) | Inshore dolphins (Indo Pacific and Snubfin dolphins) | Medium – Low (with mitigation) – impacts on soft bottom benthic habitat as per above; impacts from underwater noise not expected to be significant with mitigation and monitoring proposed to reduce impacts from marine piling in the inner port. |
| vii, x | Cetaceans (whales) | Humpback whales | Low – Trinity Bay is not an important or highly utilised habitat for these species; impacts from underwater noise not expected to be significant. |
| vii, x | Marine turtles | Green turtles, Loggerhead turtles and other species | Medium – Low (with mitigation) – impacts on seagrass habitat as per above; mitigation and monitoring proposed to reduce impacts from dredging (turtle exclusion devices, etc.). Impacts from underwater noise not expected to be significant with mitigation and monitoring proposed to reduce impacts from marine piling in the inner port. |
| X | Dugongs | Dugongs | Medium – Low (with mitigation) – impacts on seagrass habitat as per above; impacts from underwater noise not expected to be significant with mitigation and monitoring proposed to reduce impacts from marine piling in the inner port. |
| vii, x | Migratory waterbirds | Wading birds Sea birds | Low – impacts on soft bottom and mangrove habitat as per above.<br>Residual impacts on these species is predicted to be low. |
| Ix | Diversity of fish species | Commercially and recreationally important fisheries | Low – impacts on fisheries species of significance are not expected other than temporary impacts on fish movement during dredging. |
| Viii | Seascapes and landscapes | Trinity Inlet, Trinity Bay, Islands | Low – impacts will be temporary during the period of dredging and not result in permanent changes to the landscape. |

**Table B19-18** below is an assessment of the residual risk on integrity, based on the EPBC Guidelines for Impacts on Integrity.

**TABLE B19-18 SUMMARY OF RESIDUAL RISK ON GBRWHA – INTEGRITY**

| Criterion | Questions Posed by the EPBC Guidelines for Impacts on Integrity | Response |
|---|---|---|
| Wholeness | Will the proposed action of itself, or in combination with other relevant impacts, result in the loss of any elements necessary for the property to express its outstanding universal value? | The Project is not expected to result in a loss of any OUV element either individually or in combination with other projects |
| | Will the proposed action of itself, or in combination with other relevant impacts, reduce the size of the property? Will the property be of adequate size to ensure the complete representation of the features and processes which convey its significance? | As there is no reclamation component to the project, the CSD Project will not reduce the size of the WHA property except in the context of the very minor disturbance through the piling work in the inner harbor and the realignment of the channel markers along the reconfigured channel.<br>The capital dredging works will involve widening and deepening of current soft bottom benthic habitats which will continue to function following a period of temporary disturbance. These areas will start recovering almost immediately following disturbance but with full recolonization and recovery likely over short to medium time frames (6 – 24 months. |
| Intactness | Will the proposed action of itself, or in combination with other relevant impacts, result in the loss and/or degradation of the key features, processes and attributes of the property that express its outstanding universal value? | The CSD Project is not expected to result in any permanent or other measureable long term impacts or other losses to key features, processes and attributes in the WHA. |
| Threats | Will the proposed action of itself, or in combination with other relevant impacts, result in increased adverse effects of development, neglect or any other degrading process? | A range of stressors have affected the condition of near-shore ecosystems in the region. In particular, recent successive natural events have resulted in a reduction of seagrass meadows throughout the region and affected the condition of coral ecosystems. However, both seagrass and coral ecosystems in the study area have been observed to be recovering following more favourable climate and weather conditions.<br>The predicted impacts from the CSD Project on water quality and marine habitats (seagrass) will not preclude further recovery of these systems following a period of initial, temporary impact. |
| | Will the proposed action of itself, or in combination with other relevant impacts, result in an increase in processes that may cause deterioration? | Potential operational phase impacts are not expected to result in processes that will cause further deterioration. These include:<br>Increased shipping and risks associated with spills, groundings, megafauna interaction - the impacts from the increase in cruise shipping associated with the CSD Project have been addressed in the EIS and in other studies. The promulgation of the Northeast Shipping Management Plan by the Australian Maritime Safety Authority as well as other measures will seek to address the additional risk of marine traffic in and around the Great Barrier Reef. |

| Criterion | Questions Posed by the EPBC Guidelines for Impacts on Integrity | Response |
|---|---|---|
| | | Maintenance dredging - additional dredge material placement in the Marine Park from maintenance dredging will be minor with only an estimated 2 – 6 % increase in annual volume arising from the revised channel design. This volume can be accommodated in the existing approved DMPA or at the alternative deeper marine DMPA that was investigated as part of the previous Draft EIS, if greater retention of placed sediments is desirable within the Park. All material will be assessed under NAGD as being suitable for unconfined marine placement in accordance with existing approval processes. |

| **Residual risk summary** (see tables in **Section B19.5.5**) |
|---|
| Consequence: Negligible to minor |
| Likelihood: Possible |
| Duration: Short term |
| Level of risk: Negligible to low |

## B19.6.3 Consistency with International Obligations etc.

Australia's general obligations under the World Heritage Convention (UNESCO 1972) are to:

- protect, conserve and present the World Heritage values of the property
- integrate the protection of the area into a comprehensive planning program
- give the property a function in the life of the Australian community
- strengthen appreciation and respect of the property's World Heritage values, particularly through educational and information programs
- keep the community broadly informed about the condition of the World Heritage values of the property
- take appropriate scientific, technical, legal, administrative and financial measures necessary for achieving the foregoing objectives.

All impacts are assessed as having negligible to low risk (with the committed mitigation). This is consistent with the above obligations (protect, conserve).

# B19.7 World Heritage Places –Wet Tropics

## B19.7.1 Presence of Matter

The Protected Matters Search Tool (Appendix BD) reveals that the Wet Tropics of Queensland World Heritage Area (usually simply referred to as the Wet Tropics World Heritage Area or WTWHA) is within the designated search area.

The WTWHA lies outside the Study Area as shown on **Figure B19-4**. As discussed in **Chapter B8** (Terrestrial Ecology) some statistics are relevant:

- Although at its closest, the WTWHA is 3.4 km (upstream) from the Northern Sands DMPA, this is part way up the Kuranda Range Road and there is little if any ecological connection between the two areas at this point, at least from the DMPA to the WHA.
- The WTWHA has stronger but still tenuous connection to the Northern Sands DMPA via the Barron River (it is 5.8 km upstream at its closest point).
- To the east the Grey Peaks NP comes to within 4.5 km of the Tingira Street DMPA but is separated by Trinity Inlet and the East Trinity Reserve.

The assessment documented in **Chapter B8** (Terrestrial Ecology) concludes that the WTWHA is considered to be sufficiently distant and unconnected to the various project elements that it can be expected to be little impacted by the CSD Project. No further description of values and impacts in this chapter is warranted.

## B19.7.2 Summary of Residual Risk

The WTWHA is considered to be sufficiently distant and unconnected to the various project elements that it can be expected to be little impacted by the CSD Project.

| **Residual risk summary** |
|---|
| Consequence: Negligible |
| Likelihood: Highly unlikely |
| Duration: N/A |
| Level of risk: Negligible |

Potential indirect (consequential) impacts are discussed in **Chapter B18** (Cumulative Impacts Assessment) and summarised in **Section B19.19**. In summary, this concludes that there will be negligible additional impacts arising from consequential impacts (predominantly increased visitation of the WHA).

In the absence of mitigation there is no change in the assessed level of risk which remains negligible.

## B19.7.3 Consistency with International Obligations etc.

Impact risk is assessed as negligible. Approval of the CSD Project would not be inconsistent with Australia's international obligations regarding the WTWHA.

# B19.8 National Heritage Places – Great Barrier Reef

## B19.8.1 Presence of Matter

The Great Barrier Reef is one of 15 Australian World Heritage places included in the National Heritage List on 21 May 2007 (see **Section B19.2.4.d**). The place has the same boundary as the World Heritage Area. According to GBRMPA (2014a), while there are specific criteria that apply to the listing of national heritage places, the national heritage listing of the world heritage properties was done on the basis of those values identified by the World Heritage Committee.

The national heritage criteria identified as corresponding to those for which the property was world heritage listed are:

- the place has outstanding heritage value to the nation because of the place's importance in the course, or pattern, of Australia's natural or cultural history
- the place has outstanding heritage value to the nation because of the place's possession of uncommon, rare or endangered aspects of Australia's natural or cultural history
- the place has outstanding heritage value to the nation because of the place's potential to yield information that will contribute to an understanding of Australia's natural or cultural history
- the place has outstanding heritage value to the nation because of the place's importance in demonstrating the principal characteristics of:
  - a class of Australia's natural or cultural places or
  - a class of Australia's natural or cultural environments
- the place has outstanding heritage value to the nation because of the place's importance in exhibiting particular aesthetic characteristics valued by a community or cultural group.

As was the case for the strategic environmental assessment of the GBR (GBRMPA 2014a), for the purposes of this assessment, the values of the GBR national heritage place are taken to correspond to those of the GBRWHA. As a result, these two matters of national environmental significance are addressed together under the discussion on the GBRWHA.

## B19.8.2 Summary of Residual Risk

As for GBRWHA.

## B19.8.3 Consistency with International Obligations etc.

On the basis that there are likely to be no impacts of significance on the GBRWHA, the development of the CSD Project will not be contrary to:

- the National Heritage management principles
- an agreement to which the Commonwealth is party in relation to a National Heritage place
- a plan that has been prepared for the management of a National Heritage place under section 324S or as described in section 324X of the EPBC Act.

# B19.9 National Heritage Places – Wet Tropics of Queensland

## B19.9.1 Presence of Matter

The Protected Matters Search Tool (Appendix BD) reveals that the Wet Tropics of Queensland National Heritage Place is within the designated search area.

The Wet Tropics of Queensland is also one of 15 Australian World Heritage places included in the National Heritage List on 21 May 2007.

For the purposes of this assessment the Wet Tropics of Queensland national heritage place is dealt with together with the WTWHA.

## B19.9.2 Summary of Residual Risk

As for WTWHA.

## B19.9.3 Consistency with International Obligations etc.

As for WTWHA.

# B19.10 National Heritage Places – WTWHA (Indigenous Values)

## B19.10.1 Presence of Matter

The Protected Matters Search Tool (**Appendix BD**) reveals that the Wet Tropics World Heritage Area (Indigenous Values) National Heritage Place is within the designated search area.

On 9 November 2012 the Wet Tropics World Heritage Area's Indigenous heritage values were included as part of the existing Wet Tropics of Queensland National Heritage listing. The listing recognises that rainforest Aboriginal heritage is unique to the Wet Tropics and is a remarkable and continuous Indigenous connection with a tropical rainforest environment. To quote the Australian Government website (DoTE 2014a):

> The Aboriginal Rainforest People of the Wet Tropics of Queensland have lived continuously in the rainforest environment for at least 5,000 years and this is the only place in Australia where Aboriginal people have permanently inhabited a tropical rainforest environment.
>
> The Aboriginal Rainforest People developed a distinctive cultural heritage determined by their dreamtime and creation stories and their traditional food gathering, processing and land management techniques. Reliance on their traditions helped them survive in this at times inhospitable environment. The distinctiveness of the traditions and technical innovation and expertise needed to process and prepare toxic plants as food and their uses of fire is of outstanding heritage value to the nation and are now protected for future generations under national environmental law.

This amendment added a fifth national heritage criterion to the listing, namely:

> … the place's importance in exhibiting particular aesthetic characteristics valued by a community or cultural group.

As described in **Section B19.7**, the WTWHA is remote from the site and will not be affected by the development. This applies equally to Indigenous values.

However, the Northern Sands DMPA site some locally-significant Indigenous cultural heritage values and these are discussed in **Chapter 13** (Cultural Heritage).

## B19.10.2 Summary of Residual Risk

As for WTWHA.

## B19.10.3 Consistency with International Obligations etc.

As for WTWHA.

# B19.11 Listed Threatened Flora Species

## B19.11.1 Presence of Matter

As noted in **Chapter B8** (Terrestrial Ecology) the EPBC Act Protected Matters Search Tool (**Appendix BD**) was used to identify threatened terrestrial flora species that occur or could occur within the study area. This reveals that there are 72 listed threatened species in the search area. Based on knowledge of the results of ecological field surveys, results of the literature reviews, knowledge of the study area, and the preferred habitat of listed species, an assessment was made of their likely presence on the various project areas. Likelihood was determined on the basis of the following descriptions, where relevant to the lifeform in question and the study area / project area:

- Confirmed: The species has been definitively recorded within the area during the previous 'existing situation' dry season fauna survey.
- Previously recorded on site: The species has been recorded during previous studies.
- Likely: The species is known to occur within the study area based on previous desktop records, and/or there is core habitat present, and/or there are analogous local area habitats.
- May over-fly the site: The species is wide-ranging over a large territory and may over-fly the area when hunting across more optimal habitats, but the species is unlikely to use the area for hunting, nesting, resting, or escape.
- Unlikely: The species is considered to have a low likelihood of occurring in the area, or occurrence is infrequent and transient. There may be habitat for the species; however, it is marginal or not considered core habitat. Existing database records are considered historic, invalid or based on predictive habitat modelling. Despite a low likelihood based on the above criteria, the species is known from the wider region and could potentially occur within the area.

Only one listed threatened species (*Myrmecodia beccarii* – Ant plant) was recorded during the site surveys. This species was recorded within the Northern Sands Project Area, specifically within the mangrove vegetation associated with Richters Creek along the delivery pipeline corridor. In addition, two threatened species (*Eleocharis retroflexa* and *M. beccarii*) were recorded near the Tingira Street DMPA during a previous survey (GHD 2012). The following points are relevant:

- *Eleocharis retroflexa.* As noted in **Chapter B8** (Terrestrial Ecology), this was an incorrect identification – subsequent samples from across the Tingira St area were lodged with the Queensland Herbarium for identification. The formal identification was the more common and widespread *Fimbristylis polytrichoides*. In any case, the location of the original purported *E. retroflexa* was marginally outside of the current Tingira Street DMPA.
- *M. beccarii*). The location of the records was marginally outside of the current Tingira Street DMPA and the species was not recorded during the current field studies. None of the other species returned in the database searches were considered likely to occur at either site.

None of the other species returned in the database searches were considered likely to occur at either site.

## B19.11.2 Summary of Residual Risk

As described in **Chapter B8** (Terrestrial Ecology), mitigation is recommended as follows for *M. beccarii.*

Due to the high frequency of occurrence of *M. beccarii* (Ant plant) (refer **Photo B19-1**) within the mangroves associated with Richters Creek pipeline crossing and Melaleuca wetland areas, it is unlikely that clearing of this species can be completely avoided. As a mitigation measure, it is recommended that any individuals that are to be directly impacted are translocated to suitable nearby habitat. These individuals will then require monitoring to determine the success of this mitigation measure (refer to **Chapter C1** (Construction Environmental Management Plan). Thus both the consequence and the likelihood of impact on this species will decrease, as will the duration of the impact. Translocation of this species occurs often in FNQ and is highly successful.

**Photo B19-1** *Myrmecodia beccarii* in Melaleuca.

Photo courtesy of Biotropica Australia.

A further mitigation option is to construct the crossing of Richters Creek using Horizontal Directional Drilling (HDD) techniques. This would prevent any loss of *M. beccarii* habitat (in addition to minimising impacts on other MNES (discussed below)). However, HDD may not be feasible if the pipeline is to be removed at the end of the placement campaign. The assessment of mitigated impacts assumes that HDD is not employed.

**Residual risk summary**

Consequence: Negligible

Likelihood: Unlikely

Duration: Short term

Level of risk: Negligible

## B19.11.3 Consistency with International Obligations etc.

Australia has a strong commitment to the conservation of native flora and fauna around the world, and is party to a number of international conventions and agreements. These include the Convention on Biological Diversity, which covers all ecosystems, species and genetic resources and requires countries to develop and implement strategies for the sustainable use and protection of biodiversity (Australia's EPBC Act); and the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES), which is not relevant to the Project.

Australia's international obligations with respect to listed threatened species are met via the EPBC Act. As the risk of impacts is assessed as being negligible, approval of the CSD Project would be consistent with these obligations.

# B19.12 Listed Threatened Terrestrial Fauna Species

## B19.12.1 Presence of Matter

As noted in **Chapter B8** (Terrestrial Ecology) the EPBC Act Protected Matters Search Tool (**Appendix BD**) was used to identify threatened terrestrial fauna species that occur or could occur within the study area. This reveals that there are 84 listed threatened fauna species in the Northern Sands Project Area and 41 in the Tingira Street Project Area. There are 37 species that are listed as occurring in both areas (i.e. 81 unique species). Search results (incorporating EPBC Act and NC Act species) are shown in **Appendix AM (**Tables 22 and 23 and APPENDIX 3).

Based on this assessment:

- five species are listed as critically endangered
- 11 as endangered
- 13 as vulnerable
- 64 as migratory species.

Some species are shown as both migratory and listed species. Of these (referring to the search area):

- 11 species are confirmed as occurring
- 15 are likely to occur
- 24 may possibly occur
- 4 may overfly the site
- 31 are unlikely to occur.

Of these, only one listed species was recorded at either project area, the Vulnerable listed *Pteropus conspicillatus* (Spectacled flying-fox). This was recorded foraging in the mangroves on the Northern Sands Project Area in both the wet and dry season ecology surveys.

Overall:

- One threatened fauna species (*Pteropus conspicillatus* (Spectacled flying fox) EPBC – V) was recorded within the Northern Sands project area and Tingira Street study area.
- An additional two threatened species (*Esacus magnirostris* (Beach stone curlew) EPBC – Migratory) and *Crocodylus porosus* (Estuarine crocodile) EPBC – Migratory) were also considered present due to reliable desktop records (Biotropica Australia 2014) or personal communications.
- Essential habitat (under Queensland legislation) is mapped within the Northern Sands DMPA for one listed species (Casuarius *casuarius johnsonii* (Southern cassowary) although this species is most unlikely to occur.

## B19.12.2 Summary of Residual Risk

As described in **Chapter B8** (Terrestrial Ecology), mitigation is recommended as follows listed threatened fauna.

***Esacus magnirostris* (Beach stone-curlew)**

Due to the likely presence of breeding *E. magnirostris* (Beach stone-curlew) at the mouth of Richters Creek, construction work should be planned so that the construction of this section of the delivery pipeline is completed outside of the breeding season for this species (September to February). This is consistent with the construction program. It will be important to ensure that the original landform and soil profile is in place when construction is completed, to ensure that habitat quality and soil stability are encouraged. This is in-scope via the rehabilitation commitment. HDD technology would significantly reduce impacts but has not been assumed at this time.

It is noted that beach sand extraction and nourishment with associated dredging works by Cairns Regional Council occurred in this area during 2016 and original landform profile restored at works completion to ensure habitat quality and soil stability,

| **Residual risk summary** |
|---|
| Consequence: Negligible |
| Likelihood: Unlikely |
| Duration: Temporary |
| Level of risk: Negligible |

***Pteropus conspicillatus***

To minimise impacts on *P. conspicillatus* (Spectacled flying fox), any new fences should have a plain wire as a top strand, rather than barbed wire to reduce the risk of entanglement. This mitigation will reduce the consequence and likelihood of risk of impact on this species.

The night works proposed at the Northern Sands project area and Tingira Street study area may have a temporary impact on the foraging behaviour of this species. Although this impact is likely to be minor to negligible, it is recommended that, if possible, works should be completed outside of the flying fox breeding season where practicable to minimise any impact due to changes in foraging effort on breeding success. *P. conspicillatus* give birth between October and December and the juveniles are nursed for approximately five months. This is consistent with the construction program.

| **Residual risk summary** |
|---|
| Consequence: Negligible |
| Likelihood: Unlikely |
| Duration: Short term |
| Level of risk: Negligible |

## B19.12.3 Consistency with International Obligations etc.

Australia's international obligations with respect to listed threatened species are met via the EPBC Act. As the risk of impacts is assessed as being negligible, approval of the CSD Project would be consistent with these obligations.

# B19.13 Listed Threatened and Migratory Marine Species

## B19.13.1 Presence of Matter

As noted in **Chapter B7** (Marine Ecology) the EPBC Act Protected Matters Search Tool (**Appendix BD**) was used to identify threatened marine species and migratory species that occur or could occur within the study area. In summary, the following were identified:

- threatened sharks: three species
- threatened marine mammals: two species
- threatened marine reptiles: six species.

An additional seven species were listed as protected migratory species, including five mammals, one reptile and one shark.

Further to the threatened and migratory species, numerous species were listed only as 'listed marine species' (i.e. non-threatened, non-migratory). These additional EPBC Act listed marine species are not addressed in detail in this section but, for future reference, included:

- 50 sygnathids (i.e. seahorses, pipehorses, pipefish)
- 15 sea snakes
- six mammals (minke whale and five dolphins).

## B19.13.2 Summary of Residual Risk

**Chapter B7** (Marine Ecology) provides details on the presence and likely impacts on these species and specific mitigation via **Chapter C2** (Dredge Management Plan). The following is a summary of the residual risk.

**TABLE B19-19 SUMMARY OF IMPACTS ON THREATENED, MIGRATORY AND LISTED MARINE SPECIES**

| ATTRIBUTE | EXAMPLES OF THIS ATTRIBUTE IN THE LOCAL OR REGIONAL STUDY AREA | PREDICTED RISKS OF IMPACT FROM THESE IMPACTING PROCESSES (SUMMARISED FROM OTHER EIS CHAPTERS) (SEE NOTE 1) |
|---|---|---|
| Cetaceans (dolphins) | Inshore dolphins (Indo Pacific and Snubfin dolphins) | Medium – Low (with mitigation) – impacts on soft bottom benthic habitat as per above; impacts from underwater noise not expected to be significant with mitigation and monitoring proposed to reduce impacts from marine piling in the inner port. |
| Cetaceans (whales) | Humpback whales and other species of whale | Low – Trinity Bay is not an important or highly utilised habitat for these species; impacts from underwater noise not expected to be significant. |
| Marine turtles | Green turtles, Loggerhead turtles and other species | Medium – Low (with mitigation) – impacts on seagrass habitat as per above; mitigation and monitoring proposed to reduce impacts from dredging (turtle exclusion devices, etc.). Impacts from underwater noise not expected to be significant with mitigation and monitoring proposed to reduce impacts from marine piling in the inner port. |
| Dugongs | Dugongs | Medium – Low (with mitigation) – impacts on seagrass habitat as per above; impacts from underwater noise not expected to be significant with mitigation and monitoring proposed to reduce impacts from marine piling in the inner port. |

(Continued over)

| ATTRIBUTE | EXAMPLES OF THIS ATTRIBUTE IN THE LOCAL OR REGIONAL STUDY AREA | PREDICTED RISKS OF IMPACT FROM THESE IMPACTING PROCESSES (SUMMARISED FROM OTHER EIS CHAPTERS) (SEE NOTE 1) |
|---|---|---|
| Sharks | White shark, whale shark, porbeagle sharks, mackerel sharks, sawfish species | Negligible – as occasional migratory visitors to the project area, impacts are not expected to these species or groups from the CSD Project |
| Rays | Manta ray species | Negligible – as occasional visitors to the project area, impacts are not expected to these species or groups from the CSD Project |
| Crocodiles | Estuarine crocodiles | Negligible – impacts are not expected to these species or groups from the CSD Project |
| Other listed marine species | Pipefish, seahorses, sea snakes, etc. | Negligible – the extent to which the project areas are used by these listed marine species is not well understood but impacts are not expected to these species or groups from the CSD Project |

Note 1: It is relevant to note that dolphin, dugong and turtle only very low numbers utilise the area, and whales are a low number seasonal visitor,

### B19.13.3 Consistency with International Obligations etc.

Australia's international obligations with respect to listed threatened and migratory marine species listed threatened species are met via the EPBC Act. As the risk of impacts is assessed as being negligible, approval of the CSD Project would be consistent with these obligations.

# B19.14 Listed Threatened Communities

## B19.14.1 Presence of Matter

As noted in **Chapter B8** (Terrestrial Ecology) the EPBC Act Protected Matters Search Tool (**Appendix BD**) reveals that two protected ecological communities potentially occur within the project areas. These communities are:

- the Broad leaf tea-tree (*Melaleuca viridiflora*) woodlands in high rainfall coastal far north Queensland (RE equivalents are 7.3.8a, 7.3.8b, 7.3.8c, 7.3.8d, 7.5.4g, 8.3.2, 8.5.2a, 8.5.2c and 8.5.6)
- Littoral rainforest and coastal vine thickets of eastern Australia (RE equivalents are 3.2.1a, 3.2.1b, 3.2.12, 3.2.13, 3.2.28, 3.2.29, 3.2.31, 3.2.11, 3.12.20, 7.2.1a-i, 7.2.2a-h, 7.2.5a, 7.2.6b, 7.11.3b, 7.12.11d, 8.2.2 and 12.2.2).


**Figure B19-13** Location of listed threatened ecological communities.

A = Broad leaf tea-tree (*Melaleuca viridiflora*) woodlands in high rainfall coastal north Qld; B = Littoral rainforest and coastal vine thickets of eastern Australia.

See also **Figure B19-4**.

Neither of the listed communities was found to be present in either project area, despite a targeted search. Available mapping (refer **Figure B19-13**) shows the location of these communities as follows:

- the closest example of 'Broad leaf tea-tree (*Melaleuca viridiflora*) woodlands in high rainfall coastal north Qld community' ('A' on the following figure) is 6.2 km north-west of the inlet pipeline corridor
- the closest examples of 'Littoral rainforest and coastal vine thickets community' ('B' on the following figure) occurs approximately 415 m east of the inlet pipeline corridor and 850 m east of the Northern Sands DMPA.

## B19.14.2 Summary of Residual Risk

**Section B19.14.1** concludes that no threatened ecological communities are mapped as occurring within the Northern Sands Project Area or the Tingira Street Project Area. In addition, no listed threatened ecological communities were recorded during the ecology surveys.

The closest RE that is listed as being equivalent to the threatened ecological communities (RE7.3.8a) occurs 3 km southwest of the Tingira Street Project Area. The land between the study area and this RE consists of mangrove vegetation, and waters of Smiths Creek and the Trinity Inlet. The small patch of remnant vegetation RE7.3.8a is adjacent (< 100 m) to existing industrial development.

Due to the distance between the study area and the threatened ecological community it is considered unlikely that there will be any impacts on this RE as a result of the project.

| **Residual risk summary** |
|---|
| Consequence: Negligible |
| Likelihood: Highly unlikely |
| Duration: N/A |
| Level of risk: Negligible. |

## B19.14.3 Consistency with International Obligations etc.

Not applicable.

# B19.15 Listed Terrestrial Migratory Species

## B19.15.1 Presence of Matter

As noted in **Chapter B8** (Terrestrial Ecology) the EPBC Act Protected Matters Search Tool (**Appendix BD**) reveals that there are 64 terrestrial (non-marine) migratory species listed under the EPBC Act (along with 61 special least concern species under the NC Act) that are returned from desktop searches as potentially occurring within the combined Northern Sands Project Area and the Tingira Street Project Area. Some of these species are also listed threatened (EVNT - or Endangered, Vulnerable, or Near Threatened) species under the EPBC Act. Search results are shown in **Appendix AM** (Tables 22 and 23 and APPENDIX 3).

Of these, 10 non-EVNT migratory species were recorded, and based on knowledge of the species and the habitats occurring on site, 11 species are likely to occur. Of these, 11 were recorded during the site surveys.

The migratory species recorded are principally waders, shore-birds and species typical of wetland and tidal ecosystems, and common aerial species. A number of these species are protected under international conventions and treaties, specifically the Bonn Convention, JAMBA (Japan Australia Migratory Bird Agreement), CAMBA (China Australia Migratory Bird Agreement) and ROKAMBA (Republic of Korea Australia Migratory Bird Agreement). Further discussion on these treaties and agreements is included in **Appendix AM**.

During the surveys *Numenius phaeopus* (Whimbrel) was recorded once at the Tingira Street DMPA. This record was of a single individual. The project area is not of international importance to *N. phaeopus* with much greater numbers utilising the more suitable habitat available at the Cairns Foreshore location which is some 5 km south of the Tingira Street DMPA.

*Gallinago hardwickii* (Latham's snipe) does not commonly aggregate in large flocks or use the same habitats as many other migratory shorebird species. Consequently, different criteria are used from that shown above to determine important habitat for this species. Within the EPBC guidelines, important habitat for *G. hardwickii* is described as:

- areas that have previously been identified as internationally important for the species, OR
- areas that support at least 18 individuals of the species.

*G. hardwickii* was recorded at the Tingira Street DMPA Site 2 on each of the six surveys completed in this location. Although there were several individuals recorded during each survey, the maximum number of reliably distinct individuals recorded on the site by the surveyor was 13. In no cases did the number of individuals recorded using the site at one time reach 18 (the critical threshold number), meaning that this site is not of international significance to *G. hardwickii*.

**Appendix AM** concludes that neither project area is an internationally or nationally important site, nor is it defined 'important habitat' for the 37 migratory shorebird species covered by EPBC Act policy statement 3.21.

## B19.15.2 Summary of Residual Risk

**Chapter B8** (Terrestrial Ecology) concludes that for the residual risk for listed migratory species is negligible except for *G. hardwickii*) which is medium. Some details from **Chapter B8** (Terrestrial Ecology) follow.

*Gallinago hardwickii* (Latham's snipe) was recorded at the Tingira Street DMPA (Site 2) on each of the six surveys completed in this location. *G. hardwickii* does not commonly aggregate in large flocks or use the same habitats as many other migratory shorebird species. Consequently different criteria are used from that described above to determine important habitat for this species. Within the EPBC guidelines, important habitat for *G. hardwickii* is described as:

- areas that have previously been identified as internationally important for the species, OR
- areas that support at least 18 individuals of the species.

The wet grassland habitat at Tingira Street Site 1 is a seasonal feature existing only during periods of regular rainfall. Due to the transient nature of the site, it would have value to the species for only a short period each

year. The detailed assessment (**Appendix AM**) concludes that the site does not have any qualities that are not found in greater extent and better quality at East Trinity site on the eastern side of Trinity Inlet. Any birds displaced by the project are likely to use the adjacent East Trinity habitats.

Although there were several individuals recorded during each survey, 18 individuals (the critical threshold number) were not recorded using the site at one time (the maximum number of reliably distinct individuals recorded on the site by the surveyor was 13). This site is therefore not of international significance for G. hardwickii. However, for a species that does not congregate, the number of individuals of this species recorded on the site was of close to being of national importance. Unofficial counts completed in the area by bird watchers, and verbally discussed with Biotropica survey staff onsite, report numbers of national importance recorded on site (i.e. greater than 18). These figures cannot be verified.

Overall, due to the relatively large number of individuals using the site, and the permanent nature of the impact, the CSD Project is likely to have an impact on this species. The transient nature of the resources for this species reduces what may otherwise have been a relatively significant impact to a minor impact.

Mitigation is not feasible at the Tingira Street DMPA due to the intended end use of the site as an industrial hardstand.

The overall risk assessment for listed migratory species is shown below. This is based on the highest level of risk for all of the species considered (i.e. *G. hardwickii*) which is Low. All other species have a Negligible level of risk.

| **Residual risk summary** |
|---|
| Consequence: Negligible |
| Likelihood: Almost Certain |
| Duration: Permanent |
| Level of risk: Low |

**Appendix AM** concludes that neither project area is an internationally or nationally important site, nor are they defined 'important habitat' for the 37 migratory shorebird species covered by EPBC Act policy statement 3.21.

### B19.15.3 Consistency with International Obligations etc.

The migratory species recorded on the various sites are principally waders, shore-birds and species typical of wetland and tidal ecosystems, and common aerial species. A number of these species are protected under international conventions and treaties, specifically the Bonn Convention, JAMBA (Japan Australia Migratory Bird Agreement), CAMBA (China Australia Migratory Bird Agreement) and ROKAMBA (Republic of Korea Australia Migratory Bird Agreement).

These agreements list terrestrial, water and shorebird species which migrate between Australia and the respective countries. The agreements require the parties to act to protect migratory birds by:

- limiting the circumstances under which migratory birds are taken or traded
- protecting and conserving important habitats
- exchanging information
- building cooperative relationships.

The Convention on the Conservation of Migratory Species of Wild Animals (1979) (the "Bonn Convention") is an agreement whereby the Parties acknowledge the importance of migratory species being conserved, and of Range States agreeing to take action to this end whenever possible and appropriate.

In particular the Parties:

- should promote, co-operate in and support research relating to migratory species
- shall endeavour to provide immediate protection for migratory species (included in APPENDIX I of the Convention)
- shall endeavour to conclude Agreements covering the conservation and management of migratory species (included in APPENDIX II of the Convention)

Australia's international obligations with respect to migratory species are met via the EPBC Act. As the risk of impacts is assessed as being of no worse than medium, approval of the CSD Project would be consistent with these obligations.

# B19.16 Commonwealth Marine Areas

## B19.16.1 Presence of Matter

The Protected Matters Search Tool (Appendix BD) reveals that the Commonwealth Marine Areas (CMA) is within the designated search area.

CMAs include any part of the sea, including water, seabed and airspace within Australian exclusive economic zone and/or the continental shelf of Australia. They do not include state waters. The CMA stretches from 3 to 200 nautical miles from the coast. Marine protected areas are marine areas which are recognised to have high conservation value.

The only project element included within the CMA is the existing offshore DMPA and the proposed DMPA Option 1 (see **Figure B19-4**). The assessment for the GBRMP and GBRWHA applies to this area and covers the relevant criteria for this jurisdictional MNES under the EPBC Act. For this reason, the CMA within the Study Area is not further mentioned in this chapter.

## B19.16.2 Summary of Residual Risk

As for GBRMP and GBRWHA.

## B19.16.3 Consistency with International Obligations etc.

As for GBRMP and GBRWHA.

# B19.17 Great Barrier Reef Marine Park

## B19.17.1 Presence of Matter

The Protected Matters Search Tool (Appendix BD) reveals that the Great Barrier Reef Marine Park (GBRMP) is within the designated search area.

The *Great Barrier Reef Marine Park Act 1975* (Cwlth) (GBRMP Act) provides for the establishment, control, care and development of the GBRMP. The Great Barrier Reef Marine Park Authority (GBRMPA) is responsible for the management of the GBRMP.

The GBRMP Act establishes the GBRMPA and its functions. The primary functions of GBRMPA include:

- developing and implementing zoning and management plans
- environmental impact assessment and permitting of use
- research, monitoring and interpreting data
- providing information, educational services and marine environmental management advice.

The GBRMP has different boundaries and management intent from that of the GBRWHA (refer to **Figure B19-6**). Under the GBRMP Act, GBRMPA administers the framework for planning and management of the GBRMP, including through the implementation of zoning plans, plans of management and a system of permissions. The GBRMP is managed as a multiple use area, meaning that the Zoning Plan (GBRMPA 2003) provides for a range of recreational, commercial and research opportunities, and traditional activities whilst also considering conservation of the GBRMP. The GBRMP's Zoning Plan (GBRMPA 2003) also takes account of the world heritage values, despite the differing management boundaries.

Zoning provides protection for areas critical to maintaining a healthy environment and sets a broad framework for the management of human use by designating where specific types of activities can be undertaken. Zoning also defines what activities can occur in various parts of the GBRMP.

There are four primary sections of the GBRMP that have a Zoning Plan as a basis for management. These are the Far Northern Section, the Cairns Section, Central Section and Mackay/Capricorn Section. These sections are further broken down into locations near regional centres (e.g, Townsville, Innisfail, etc.). The parts of the GBRMP used most by cruise ships are the Cairns Area and the Whitsundays.

**Figure B19-14** shows the GBRMP Zoning Plan map for Trinity Bay. Some of the project area is located within the General Use Zone, which is identified as being suitable for uses such as boating, diving, fishing, and trawling. Although the approach channel does not fall within the GBRMP, the existing maintenance dredging placement area is located within the General Use Zone. The area to the immediate east of the access channel is part of the Estuarine Conservation Zone. This area allows for the maintenance of fisheries production and use and traditional hunting and gathering.

Ecological aspects of this zone are described in **Chapter B7** (Marine Ecology) and **Chapter B8** (Terrestrial Ecology). Under the existing zoning plan:

- most of the foreshore of Cairns Harbour, the eastern section of Cairns Harbour between the shipping channel and Yarrabah, and the southern sections of Trinity Inlet (including Admiralty Island) is zoned Estuarine Conservation (only applies to GBR Coast Marine Park)
- the western section of Cairns Harbour and areas immediately adjacent are zoned General Use
- the closest areas zoned Habitat Protection are located north of Trinity Beach, and east of Mission Bay
- Mission Bay located to the east of Cairns Harbour (i.e. east of False Cape) is zoned Conservation Park
- the closest areas zoned Marine National Park occur at Wide Bay (located east of Cape Grafton, approximately 15 km from the study area) and waters adjacent to Green Island, approximately 20 km from the study area.

The Port's facilities, existing channels, and pump out points for the land placement sites are located outside the GBRMP but the existing and preferred DMPA sites for maintenance dredging are located within it.

The management objectives for zones are set out in the GBRMP Zoning Plan (GBRMPA 2003) and Marine Parks (GBR Coast) Zoning Plan 2004. Objectives of GBRMP zones within and adjacent to the study area are outlined in **Table B19-20**. Under the Cairns GBRMP Cairns Zoning Plan, only the General Use Zone may be used or entered without a permit for the navigation of ships.

**TABLE B19-20 MANAGEMENT OBJECTIVES OF MARINE PARK ZONES**

| ZONE | OBJECTIVES |
|---|---|
| General Use | To provide for the conservation of areas of the GBRMP, while providing opportunities for reasonable use. |
| Conservation Park | To provide for the conservation of areas of the GBRMP, while providing opportunities for reasonable use and enjoyment, including limited extractive use. |
| Habitat Protection | To provide for the conservation of areas of the GBRMP within this zone through the protection and management of sensitive habitats, generally free from potentially damaging activities, while providing opportunities for reasonable use. |
| Marine National Park | To provide for the protection of the natural integrity and values of areas of the GBRMP, generally free from extractive activities, while providing opportunities for certain activities, including the presentation of the values of the GBRMP, to be undertaken in relatively undisturbed areas. |
| Estuarine Conservation* | To provide for the protection of the natural integrity and values of the areas of the GBRMP within the zone, while providing opportunities for the:<br>• Presentation of the values of the relatively undisturbed areas of the GBRMP within the zone<br>• Continuation of existing fishing use in the area. |

*relevant only to GBR Coast Marine Park (State Marine - Park)

GBRMPA issued a Marine Park Permit in 2010 to Ports North. This is valid for the period 17 June 2010 to 1 June 2020. The permit allows for the placement of up to a maximum of 6.6 (wet load) M $m^3$ of dredge material associated with maintenance dredging at the Port of Cairns within the approved (DMPA) (located within a circular area of one nautical mile diameter as shown on see **Figure B19-14**. Additional dredge material placement in the Marine Park from maintenance dredging will be minor with only a 2 – 6 % increase in annual volume from the revised channel design. This volume can be accommodated in the existing approved DMPA or at the alternative deeper marine DMPA that was investigated as part of the previous Draft EIS, if greater retention of placed sediments is desirable.

The protected matters report (**Appendix BD**) lists five zoned areas of the GBRMP, namely:

- Conservation Park CP-16-4033 IV
- Conservation Park CP-16-4037 IV
- General Use GU-16-6004 VI
- Habitat Protection HP-16-5131 VI
- Habitat Protection HP-16-5130 VI.

Although in general the GBRMP lies seaward of low water between Bundaberg and Cape York, for parts of the Port of Cairns (south of Taylor Point and north of False Cape) the boundary is off-shore as shown on **Figure B19-14**. Adjacent to the project site the boundary is approximately 3.5 km off-shore (1.9 km off-shore of the lake inlet point). Seaward to this line the GBRMP zoning is General Use, while the Habitat Protection zone lies north of Taylor Point.

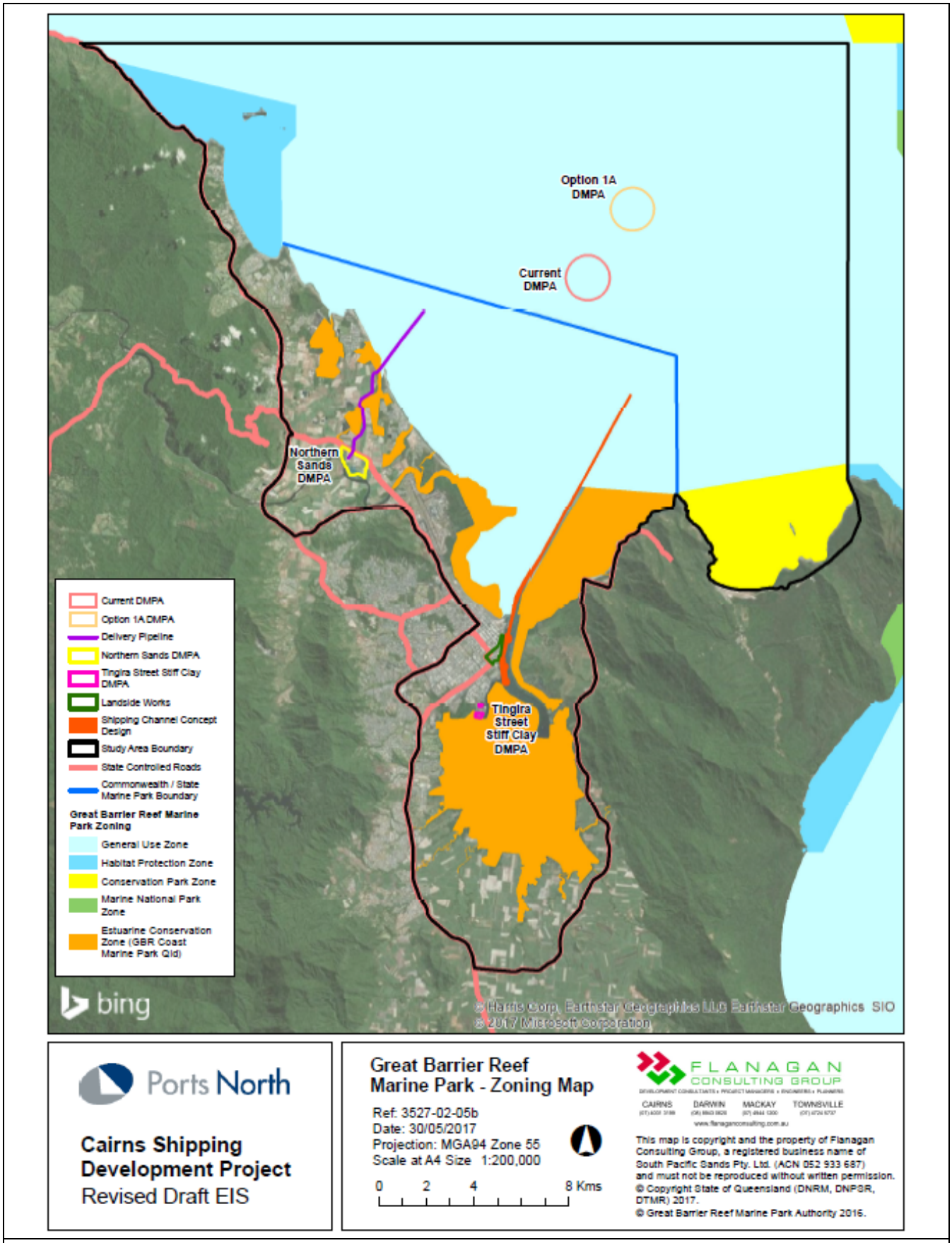



**Figure B19-14** Great Barrier Reef Marine Park – Zoning Map.

Note that the Estuarine Conservation Zone and the part of the General Use zone landward of the GBRMP boundary is declared as part of the GBR Coast Marine Park (Qld).

The GBR Region and the GBR Marine Park cover the same area, with the exception of 13 coastal exclusion areas that are not within the Marine Park. Cairns is one such exclusion area (see **Figure B19-6**).

The Marine Park covers 344 400 square kilometres and includes the subsoil beneath the seabed extending to a depth of 1000 metres and the airspace above extending to a height of 915 metres.

### B19.17.2 Summary of Residual Risk

As was the case for the strategic environmental assessment of the GBR (GBRMPA 2014a), for the purposes of this assessment, the values of the GBRMP are taken to correspond to those of the GBRWHA. As a result, these two matters of national environmental significance are addressed together under the discussion on the GBRWHA. This is despite the fact that the boundaries are slightly different (see **Figure B19-6**).

The CSD Project does not involve any works in the GBRMP. Possible indirect impacts involve some of those assessed for the GBRWHA (**Section B19.6**), namely:

- the creation of turbid plumes during dredging and dredge material placement, which can increase both turbidity within the water column and sediment deposition on the seabed
- temporary water quality impacts associated with discharge of tailwater from the Northern Sands DMPA
- direct or indirect effects on marine megafauna, avifauna and other species and populations arising from interactions with vessels, noise and lighting
- increased volume of material placed as part of maintenance dredging of the new channel at the approved marine DMPA in the GBR Marine Park.

**Chapter B18** (Cumulative Impacts Assessment) assesses these and other impacts in the context of cumulative and consequential impacts based on the methodology derived for the strategic assessment of the GBR (GBRMPA 2014).

The indirect impacts from dredging on the GBRMP are addressed in the discussion of World Heritage Values above, noting that the attributes underpinning World Heritage listing also underpin marine park listing and management objectives.

Further assessment against the key criteria for assessment of impacts for the GBRMP as identified in relevant Significant Impact Guidelines (DEWHA 2009) are identified in **Table B19-21** below

**TABLE B19-21 ASSESSMENT OF IMPACTS TO GBR MARINE PARK**

| SIGNIFICANCE CRITERION | ASSESSMENT |
|---|---|
| Modify, destroy, fragment, isolate or disturb an important, substantial, sensitive or vulnerable area of habitat or ecosystem component such that an adverse impact on marine ecosystem health, functioning or integrity in the GBRMP results | Refer **Chapter B3** (Coastal Processes), **Chapter B5** (Water Quality), **Chapter B7** (Marine Ecology).<br>The zones of impact and influence from dredging water quality impacts are largely contained within the exclusion area to the Commonwealth Marine Park. Only the zones of influence extend beyond the boundary. Water quality impacts in these areas will not have an ecological effect on corals, seagrass, soft bottom benthos or other marine habitats that underpin the health, functioning and integrity of the Park.<br>Additional dredge material placement in the Marine Park from maintenance dredging will be minor with only a 2 – 6 % increase in annual volume from the revised channel design. This volume can be accommodated in the existing approved DMPA or at the alternative deeper marine DMPA that was investigated as part of the previous Draft EIS, if greater retention of placed sediments is desirable within the Park.<br>Reactive and validation monitoring programmes are proposed to ensure impacts are avoided or minimised as set out in **Chapter C2** (Dredge Management Plan). |

(Continued over)

| SIGNIFICANCE CRITERION | ASSESSMENT |
|---|---|
| Have a substantial adverse effect on a population of a species or cetacean including its life cycle (for example, breeding, feeding, migration behaviour, life expectancy) and spatial distribution | Refer **Chapter B7** (Marine Ecology).<br>While low numbers of such marine fauna are known to utilise the waters regionally in proximity to the project, the project is not expected to result in a significant impact on any important megafauna species, critical habitat or other habitat important for the life cycle of these species. |
| Result in a substantial change in air quality or water quality (including temperature) which may adversely impact on biodiversity, ecological health or integrity or social amenity or human health | Refer **Chapter B5** (Marine Water Quality) and **Chapter B11** (Air Quality).<br>Substantial changes to these environmental values are not expected as the result of the implementation of appropriate mitigation measures. For water quality this includes dredge management strategies such as reducing dredge overflow and placement in the new, retentive DMPA. |
| Result in a known or potential pest species being introduced or becoming established in the GBRMP | Refer **Chapter B7** (Marine Ecology) and **Chapter C2** (Dredge Management Plan). Vessels that undertake dredging will be required to be inspected for marine pests and manage ballast and exchange waters in accordance with International Maritime Organisation procedures and Department of Agriculture and Water Resources requirements as outlined in **Chapter C2** (Dredge Management Plan). |

**Residual risk summary**

Consequence: Minor – Moderate

Likelihood: Highly unlikely / rare

Duration: Short term

Level of risk: Negligible – Low

### B19.17.3 Consistency with International Obligations etc.

As per GBRWHA.

## B19.18 Commonwealth Land

### B19.18.1 Presence of Matter

The Protected Matters Search Tool (Appendix BD) reveals that there are seven listed areas of Commonwealth land within the search area. The search report notes that, due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision.

Commonwealth land is defined under the EPBC Act as including:

- land owned by the Commonwealth or a Commonwealth agency (including land owned in Norfolk Island) and airspace over the land
- an area of land held under lease by the Commonwealth or a Commonwealth agency (including an area held under lease in Norfolk Island) and airspace over the land
- land in:
  - an external Territory (except Norfolk Island); or
  - the Jervis Bay Territory;
- and airspace over the land.

Listed sites from the Protected Matters Search Tool are as shown on **Figure B19-15** below.

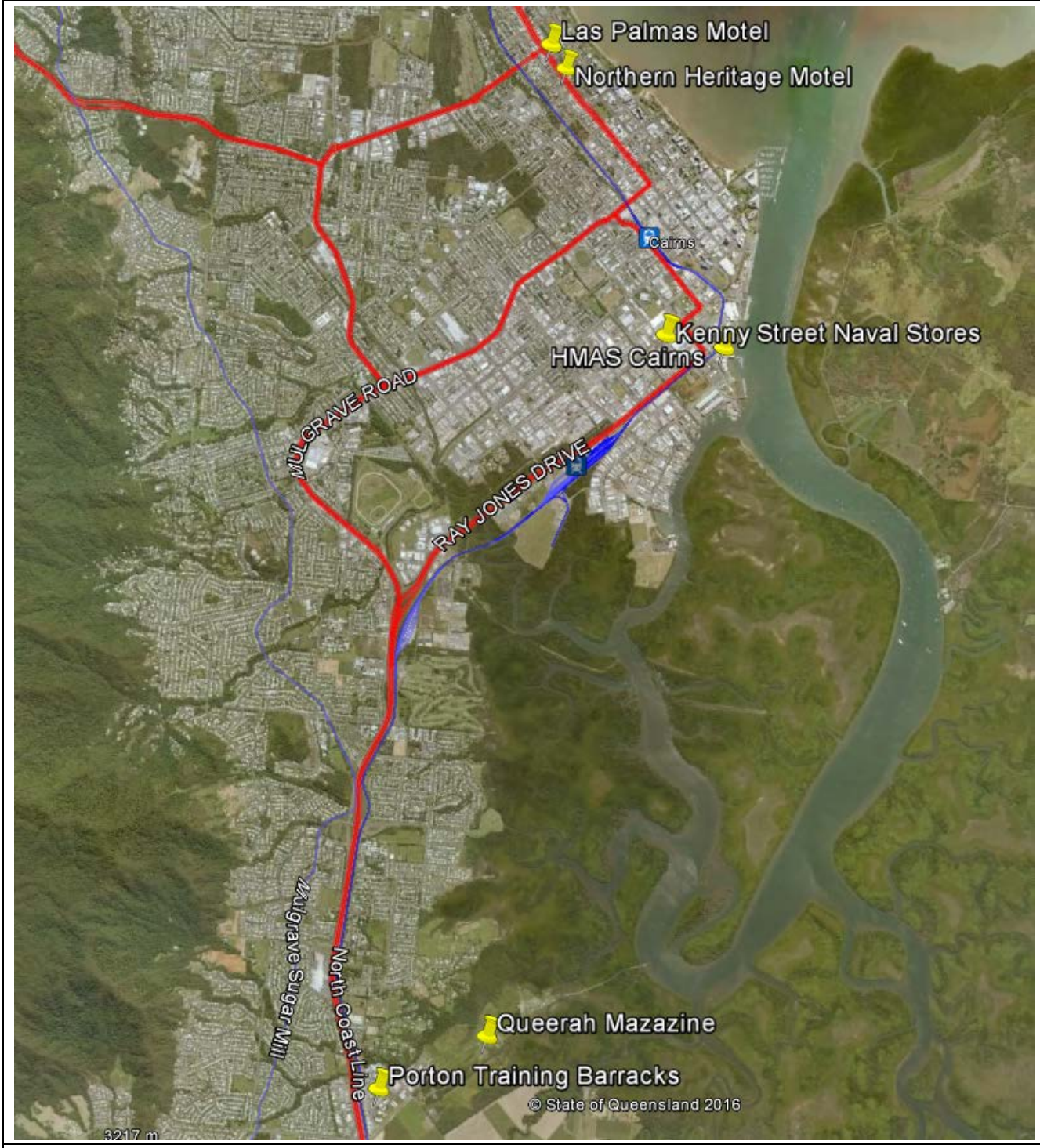



**Figure B19-15** Commonwealth Land.

These are detailed in **Table B19-22Error! Not a valid bookmark self-reference.**.

**TABLE B19-22 COMMONWEALTH LAND**

| Name | Lot / Plan |
|---|---|
| Defence – Cairns Vacant Site | Location not confirmed |
| Defence – HMAS Cairns (Cairns) | 183/SP207572 |
| Defence – Kenny Street Naval Stores (Cairns) | Lot 3 C198374 |
| Defence – Las Palmas Motel (Cairns) | 1/RP748801 |
| Defence – Northern Heritage Motel (Cairns) | 1/RP735342 |
| Defence – Porton Training Depot (Cairns) | 37/RP912874 |
| Defence – Queerah Magazine | A/NR7146? |

**Source:** Study team compilation.

## B19.18.2 Summary of Residual Risk

None of these sites is within the footprint of the CSD Project and none is likely to be impacted in any way by the development.

## B19.18.3 Consistency with International Obligations etc.

Not applicable.

# B19.19 Cumulative and Consequential Impacts

## B19.19.1 Cumulative Impacts

Cumulative impacts are addressed in **Chapter B18** (Cumulative Impacts Assessment). In summary, the methodology used involves:

- consideration of types of impacts (including cumulative and consequential)
- definition of assessment scales for considering various types of impacts
- overview of the existing situation of the CSD Project Study Area and the broader GBR in terms of the various actions that could be relevant to the CIA (in addition to completed or proposed projects this includes activities that currently put the values of the GBR at risk and could therefore interact with the CSD Project).

Regarding this last point, considerable use is made of the findings of the Strategic Assessment of the GBR (GBRMPA 2014a) regarding the impacts of past and current activities on the values of the GBR (this provides a context for considering the impacts of the CSD Project and other projects). In summary, the assessment investigates the interaction of the CSD Project and other potential projects in terms of the impacts of concern determined by GBRMPA (2014a).

Potential impacts in common with known stressors (i.e. impacts of concern determined by GBRMPA (2014a) and possible CSD Project impacts are (see also **Table B19-8**):

- dredging
- exotic species and diseases
- marine debris
- modifying supporting terrestrial habitats
- physical damage — ship grounding
- sediments from catchment run-off
- vessel strike on wildlife.

These were all found to be not relevant or involve Negligible residual risk.

## B19.19.2 Consequential Impacts

Consequential impacts are also addressed in **Chapter B18** (Cumulative Impacts Assessment). In summary, consequential impacts are those that arise as a result of the project, particularly in the long term. These are considered to be as follows:

- increased cruise shipping
- increased maintenance dredging
- increased fuel bunkering
- increased visitation
- increased demand on infrastructure and services
- end-uses of the two DMPAs.

These were all found to involve Negligible residual risk.

# B19.20 Summary

## B19.20.1 Summary of Residual Impacts on MNES

**Table B19-23** shows a summary of impacts, mitigation, and residual impact on all Nature Conservation Areas.

## B19.20.2 Summary Against the Objects of the EPBC Act

An assessment of the CSD Project against the objects of the EPBC Act (**Section B19.2.1**) is provided in below.

**TABLE B19-23 ASSESSMENT SUMMARY TABLE – MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE**

| Controlling Provision | Summary of Impact | Mitigation Measures | Residual Risk Rating with mitigation measures in place |
|---|---|---|---|
| ***World Heritage properties (sections 12 and 15A)*** | | | |
| GBRWHA and Great Barrier Reef Marine Park – Whole of Property Scale | Consideration of impacts from the project on Key Attributes as listed in **Table B19-17**<br>No significant impacts are predicted at the Whole of Property Scale | Dredge Management Plan and other plans outlined in Part C | Negligible |
| GBRWHA and Great Barrier Reef Marine Park – Regional Scale | Consideration of impacts from the project on Key Attributes as listed in **Table B19-17**<br>No significant impacts are predicted at the Regional Scale | Dredge Management Plan and other plans outlined in Part C | Low – Negligible |
| GBRWHA and Great Barrier Reef Marine Park – Local Scale | Consideration of impacts from the project on Key Attributes as listed in **Table B19-17**<br>No significant impacts are predicted at the Local Scale<br>Low residual risks are predicted with respect to soft bottom benthic habitat in the dredge footprint and in the proposed DMPA (with full recovery in six-24 months)<br>Low residual risks are predicted with respect to temporary water quality impacts to recovering seagrass areas in Trinity Bay and in the context of tailwater discharge from the Northern Sands DMPA | Dredge Management Plan and other plans outlined in Part C | Low |
| Wet Tropics World Heritage Area | No impact will occur to this area | None identified | Negligible |
| ***National Heritage places (sections 15B and 15C)*** | | | |
| GBR NHP | As per GBRWHA (applies at all scales as appropriate ) | As per GBRWHA | Low – Negligible |
| Wet Tropics NHP | No impact will occur to this area | None identified | Negligible |
| WTWHA (Indigenous Places) NHP | No impact will occur to this area | None identified | Negligible |

(Continued over)

| Controlling Provision | Summary of Impact | Mitigation Measures | Residual Risk Rating with mitigation measures in place |
|---|---|---|---|
| *Other* | | | |
| Commonwealth Marine Area | No significant impacts are predicted in the Commonwealth Marine Area | Dredge Management Plan and other plans outlined in Part C | Negligible |
| ***Listed threatened species and communities (sections 18 and 18A) – species*** | | | |
| Flora (*Myrmecodia beccarii* – Ant plant) | Clearing of many individuals for construction of Northern Sands DMPA delivery pipeline | Translocation to suitable nearby habitat – **Chapter C1** (Construction Environmental Management Plan) | Negligible |
| Fauna (*Esacus magnirostris* – Beach stone-curlew) | Disturbance by construction and demobilisation of Northern Sands DMPA delivery pipeline | Avoid works at the mouth of Richters Creek during breeding season– **Chapter C1** (Construction Environmental Management Plan) | Negligible |
| Fauna (*Pteropus conspicillatus* – Spectacled flying fox) | Disturbance by night works at the two DMPAs | Avoid works at the DMPAs during breeding season– **Chapter C1** (Construction Environmental Management Plan) | Negligible |
| ***Listed threatened marine species (sections 18 and 18A) and marine migratory species sections 20 and 20A)*** | | | |
| Cetaceans (dolphins) (Note 1) | Impacts on soft bottom benthic habitat; impacts from underwater noise not expected to be significant with mitigation and monitoring proposed to reduce impacts from marine piling in the inner port | Dredge Management Plan and other plans outlined in Part C | Low |
| Cetaceans (whales) (Note 1) | Impacts from underwater noise | Dredge Management Plan and other plans outlined in Part C | Low |
| Marine turtles (Note 1) | Impacts on seagrass habitat; impacts from underwater noise | Dredge Management Plan and other plans outlined in Part C (e.g. turtle exclusion devices, marine piling controls in the inner port) | Low |
| Dugongs (Note 1) | Impacts on seagrass habitat; impacts from underwater noise | As above | Low |
| Sharks (Note 1) | No impacts identified | None identified | Negligible |

| Controlling Provision | Summary of Impact | Mitigation Measures | Residual Risk Rating with mitigation measures in place |
|---|---|---|---|
| Rays (Note 1) | No impacts identified | None identified | Negligible |
| Crocodiles (Note 1) | No impacts identified | None identified | Negligible |
| Other listed marine species (Note 1) | No impacts identified | None identified | Negligible |
| ***Listed threatened species and communities (sections 18 and 18A) – communities*** | | | |
| 2 communities in search – nil recorded | No impact will occur to these communities | None identified | Negligible |
| ***Listed migratory species (sections 20 and 20A) – other than marine*** | | | |
| *Gallinago hardwickii* (Latham's snipe) | Loss of habitat at the Tingira Street DMPA | None identified (not feasible due to the intended end use of the site as an industrial hardstand) | Low |
| Marine species – included above with listed threatened marine species | Included above with listed threatened marine species | Included above with listed threatened marine species | Included above with listed threatened marine species |
| ***Commonwealth marine areas (sections 23 & 24A)*** | | | |
| Commonwealth Marine Area | No significant impacts are predicted in the Commonwealth Marine Area | Dredge Management Plan and other plans outlined in Part C | Negligible |
| ***Great Barrier Reef Marine Park (sections 24B and 24C)*** | | | |
| Great Barrier Reef Marine Park | As per GBRWHA | As per GBRWHA | Low – Negligible |
| ***Commonwealth land (sections 26 & 27 A)*** | | | |
| Defence – Cairns Vacant Site<br>Defence – HMAS Cairns - Cairns<br>Defence – Kenny Street Naval Stores - Cairns<br>Defence – Las Palmas Motel - Cairns<br>Defence – Northern Heritage Motel - Cairns<br>Defence – Porton Training Depot - Cairns<br>Defence – Queerah Magazine | No impact will occur to these areas | None identified | Negligible |

Note 1. See also **Table B19-19**.

**TABLE B19-24 SUMMARY AGAINST THE OBJECTS OF THE EPBC ACT**

| ITEM | GBRWHA (AND NHP) | WTWHA (AND NHP) | LISTED SPECIES AND COMMUNITIES | MIGRATORY SPECIES | GBRMP | NOTES |
|---|---|---|---|---|---|---|
| **Objects of the EPBC Act:** | | | | | | |
| Provide for the protection of the environment, especially those aspects of the environment that are matters of national environmental significance. | Complies.<br>There are no significant impacts on the OUV and integrity of the GBRWHA. | Complies.<br>No direct impacts on environmental values.<br>Consequential (tourism) use can be managed by the existing permit system. | Complies.<br>There are no significant impacts on listed threatened species.<br>No listed communities are present. | Complies.<br>There are no significant impacts on listed migratory species. | Complies (via *Great Barrier Reef Marine Park Act*).<br>There are no significant impacts on the GBRMP's environmental values.<br>Consequential (tourism) use can be managed by the existing permit system. | Complies.<br>There are no significant impacts on the OUV and integrity of the GBRWHA, listed species, or the GBRMP. |
| Promote ecologically sustainable development through the conservation and ecologically sustainable use of natural resources. | See Notes (final column). | See Notes (final column). | See Notes (final column). | See Notes (final column). | See Notes (final column). | Complies.<br>All aspects of the CSD Project involve negligible to medium residual risks and measures to manage and mitigate these. |
| Promote the conservation of biodiversity. | Complies.<br>No significant impact on GBR biodiversity. | Complies. | Complies. | Complies. | Complies. | Complies.<br>All aspects of the CSD Project involve negligible to medium residual risks and measures to manage and mitigate these. |

| ITEM | GBRWHA (AND NHP) | WTWHA (AND NHP) | LISTED SPECIES AND COMMUNITIES | MIGRATORY SPECIES | GBRMP | NOTES |
|---|---|---|---|---|---|---|
| Provide for the protection and conservation of heritage. | Complies.<br>There are no significant impacts on heritage values. | Complies.<br>There are no significant impacts on heritage values.<br>Consequential (tourism) use can be managed by the existing permit system. | N/A. | N/A. | Complies (via *Great Barrier Reef Marine Park Act*).<br>There are no significant impacts on the GBRMP's heritage values.<br>Consequential (tourism) use can be managed by the existing permit system. | Complies.<br>No direct impacts on environmental or heritage values.<br>Consequential (tourism) use can be managed by the existing permit system. |
| Promote a co-operative approach to the protection and management of the environment involving governments, the community, land-holders and indigenous peoples. | See Notes (final column). | See Notes (final column). | See Notes (final column). | See Notes (final column). | See Notes (final column). | Complies.<br>Production of CHMP will formalise relations with relevant Indigenous people and protect existing sites and interests. |
| Assist in the co-operative implementation of Australia's international environmental responsibilities. | See Notes (final column). | See Notes (final column). | See Notes (final column). | See Notes (final column). | See Notes (final column). | Complies.<br>No actions will be inconsistent with international environmental responsibilities. |

(Continued over)

| ITEM | GBRWHA (AND NHP) | WTWHA (AND NHP) | LISTED SPECIES AND COMMUNITIES | MIGRATORY SPECIES | GBRMP | NOTES |
|---|---|---|---|---|---|---|
| Recognise the role of indigenous people in the conservation and ecologically sustainable use of Australia's biodiversity. | See Notes (final column). | See Notes (final column). | See Notes (final column). | See Notes (final column). | See Notes (final column). | Complies.<br>Production of CHMP will formalise relations with relevant Indigenous people and protect existing sites and interests. |
| Promote the use of indigenous peoples' knowledge of biodiversity with the involvement of, and in co-operation with, the owners of the knowledge. | See Notes (final column). | See Notes (final column). | See Notes (final column). | See Notes (final column). | See Notes (final column). | Complies.<br>Production of CHMP will formalise relations with relevant Indigenous people and protect existing sites and interests. |
| **ESD Principles:** | | | | | | |
| Decision making processes should effectively integrate both long and short-term economic, environmental, social and equity considerations. | See Notes (final column). | See Notes (final column). | See Notes (final column). | See Notes (final column). | See Notes (final column). | Complies. |

(Continued over)

| ITEM | GBRWHA (AND NHP) | WTWHA (AND NHP) | LISTED SPECIES AND COMMUNITIES | MIGRATORY SPECIES | GBRMP | NOTES |
|---|---|---|---|---|---|---|
| Where there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. | Complies.<br>No threats of serious or irreversible environmental damage have been identified despite rigorous assessment. | N/A. | Complies.<br>No threats of serious or irreversible environmental damage have been identified despite rigorous assessment. | No threats of serious or irreversible environmental damage have been identified despite rigorous assessment. | No threats of serious or irreversible environmental damage have been identified despite rigorous assessment. | Complies.<br>No threats of serious or irreversible environmental damage on matters of NES have been identified despite rigorous assessment. |
| The global dimension of environmental impacts of actions and policies should be recognised and considered. | See Notes (final column). | See Notes (final column). | See Notes (final column). | See Notes (final column). | See Notes (final column). | Complies.<br>It is considered that most impacts apply at a local scale only.<br>The exception is the travel associated cruise ships – this is a global issue and applies to all projects with an international client base. |
| The need to develop a strong, growing and diversified economy which can enhance the capacity for environmental protection should be recognised. | See Notes (final column). | See Notes (final column). | See Notes (final column). | See Notes (final column). | See Notes (final column). | Complies.<br>The proposed commitments to conservation and sustainability initiatives can only be made within the context of a viable and profitable project. |

(Continued over)

| ITEM | GBRWHA (AND NHP) | WTWHA (AND NHP) | LISTED SPECIES AND COMMUNITIES | MIGRATORY SPECIES | GBRMP | NOTES |
|---|---|---|---|---|---|---|
| The need to maintain and enhance international competitiveness in an environmentally sound manner should be recognised. | See Notes (final column). | See Notes (final column). | See Notes (final column). | See Notes (final column). | See Notes (final column). | Complies.<br>The proponent is satisfied that the commitments to conservation and sustainability can be afforded in the international market. Such initiatives are seen as contributing to the project's green credentials. |
| Cost effective and flexible policy instruments should be adopted, such as improved valuation, pricing and incentive mechanisms. | See Notes (final column). | See Notes (final column). | See Notes (final column). | See Notes (final column). | See Notes (final column). | N/A. |
| Decisions and actions should provide for broad community involvement on issues which affect them. | See Notes (final column). | See Notes (final column). | See Notes (final column). | See Notes (final column). | See Notes (final column). | The proponent has committed to support a suite of community strategies that include community participation. |

(Continued over)

| ITEM | GBRWHA (AND NHP) | WTWHA (AND NHP) | LISTED SPECIES AND COMMUNITIES | MIGRATORY SPECIES | GBRMP | NOTES |
|---|---|---|---|---|---|---|
| Justification regarding manner proposed to undertake project | See Notes (final column). | N/A. | See Notes (final column). | See Notes (final column). | See Notes (final column). | The proposed manner by which the project will be undertaken includes an integrated suite of avoidance, minimisation, and mitigation measures. Mitigation is largely by way of construction and operation phase management – most impacts have been avoided through planning and design initiatives. |
| Acceptability of avoidance measures | See Notes (final column). | N/A. | See Notes (final column). | See Notes (final column). | See Notes (final column). | Acceptable.<br>Avoidance measures are focused on habitat protection and restoration, reduction in export of pollutants in stormwater drainage and tailwater. |
| Acceptability of mitigation measures | See Notes (final column). | N/A. | See Notes (final column). | See Notes (final column). | See Notes (final column). | Acceptable.<br>Mitigation measures are focused on on-going environmental management to cover the construction and operation phases. |

(Continued over)

| ITEM | GBRWHA (AND NHP) | WTWHA (AND NHP) | LISTED SPECIES AND COMMUNITIES | MIGRATORY SPECIES | GBRMP | NOTES |
|---|---|---|---|---|---|---|
| Acceptability of residual impacts | Acceptable – no significant adverse impact. | N/A. | Acceptable – no significant adverse impact. | Acceptable – no significant adverse impact. | Acceptable – no significant adverse impact. | Overall, the outcome is acceptable as there are no significant residual adverse impacts on any matter of NES. |
| Need for and effectiveness of offsets | Not required as there is no significant adverse residual impact. | N/A. | Not required as there is no significant adverse residual impact. | Not required as there is no significant adverse residual impact. | Not required as there is no significant adverse residual impact. | Overall, no offsets are required as there are no significant adverse residual impacts on any matter of NES. |

# B19.21 Allied Matters

## B19.21.1 Cost of Mitigation Measures

As described in **Chapter A2** (Project Background), substantial mitigation has been adopted in the design of the project (land placement options, channel optimisation) and management (via the management plans described in **Table B19-6**).

The cost of these mitigation measures has been included in the project budget. No additional mitigation measures have been identified as being required and hence no cost implications require discussion.

## B19.21.2 Offsets

### B19.21.2.a Background

The policy basis for offsets under the EPBC Act is described in **Section B19.2.3**. In simple terms, offsets are required if residual impacts are 'significant' as determined by reference to the significant impact guidelines.

### B19.21.2.b Need for Offsets

In the risk assessment used in this chapter, only Extreme Risk and High Risk are defined as having a significant impact on a MNES. The highest risk rating of residual risk for any MNES is Low as defined in **Table B19-13** as 'Manageable by standard mitigation and similar operating procedures'.

Subject to a formal self-assessment to determine whether offsets are required, preliminary indications suggest that significant impact criteria will be met. Therefore, under these circumstances there is no need to consider offsets.

Refer also to **Chapter B18** (Cumulative Impacts Assessment) where a whole-of-project assessment is undertaken.

### B19.21.3 Monitoring

Ports North undertakes a range of monitoring programs to manage potential impacts from the organisation's activities at the Port of Cairns. These include monitoring of water and sediment quality, biosecurity, land contamination, and marine habitats.

These programmes will continue in addition to CSDP specific monitoring outlined later in the Part C Management Plans and any resultant conditions of approval which will be implemented by both Ports North (or appointed parties subject to resolution of detailed project management and procurement process) as part of project implementation.

Refer to **Table B19-6** for details of environmental management plans. These include monitoring where appropriate.

# B19.22 Relevant Reports and Plans

## B19.22.1 Background

In its email dated 13 December 2016 (see **Section B19.1.2.d**), DoEE advised that reference should be made to the following documents issued since the publication of the EIS guidelines (stressing that this list was not exhaustive):

- GBR Biodiversity Conservation Strategy (2013)
- Reef Water Quality Protection Plan (2013)
- GBR Strategic Assessment (2014)
- GBR Outlook Report (2014)
- North-East Shipping Management Plan (2014)
- Referral guidelines for GBR OUV (2014)
- Reef 2050 (2015) including the Maintenance Dredging Strategy for Great Barrier Reef World Heritage Area Ports (TMR 2016).

Aspects of these documents and the associated plans relevant to the CSD Project are described below.

## B19.22.2 Review of Relevant Strategic Documents

### B19.22.2.a GBR Biodiversity Conservation Strategy (2013)

#### Discussion

The Great Barrier Reef Biodiversity Conservation Strategy 2013 (GBRMPA 2013) provides a framework for improving biodiversity conservation in the Great Barrier Reef Region. It was developed in consultation with Australian and Queensland government agencies, researchers, industry representatives and conservation groups. The strategy's approach includes continuing to foster industry and community stewardship of the Reef, building ecosystem resilience in a changing climate and improving our knowledge to make more informed decisions. It was developed within the context of the following key documents:

- the Australian Government's Australia's Biodiversity Conservation Strategy 2010–2030
- the Queensland Government's Building Nature's Resilience: A Biodiversity Strategy for Queensland
- the Australian Government's draft biodiversity policy.

The strategy establishes a process for determining and documenting the habitats, species and groups of species that are potentially at risk. Vulnerability assessments are being completed to identify actions to reduce the threats and pressures facing at-risk biodiversity. The habitats considered to be potentially at-risk are coral reefs, islands, the lagoon floor, mangroves, open waters and seagrass meadows. The species or species groups considered to be potentially at-risk are the dwarf minke whale, dugong, grey mackerel, humpback whale, inshore dolphins, king and blue threadfin salmon, marine turtles, seabirds, sea snakes, sharks and rays (including sawfish) and snapper.

The strategy seeks to recognise and build on these existing programs. This is addressed through a framework for action based on three strategic objectives aimed at restoring or maintaining ecosystem resilience and protecting biodiversity. These objectives are:

- engaging communities and fostering stewardship
- building ecosystem resilience in a changing climate
- improving knowledge.

Each of the strategic objectives was supported by long-term objectives, outcomes and key actions. The strategy is referred to in the Outlook report 2014 which notes that planning for biodiversity management has been significantly improved since the 2009 assessment through preparation of the Great Barrier Reef

Biodiversity Conservation Strategy 2013, although 'targets in the plan tend to be focused on process and output rather than outcomes' (p 212). In addition, 'targets and performance measures for coastal ecosystems cannot address coastal development due to jurisdictional responsibilities' (p 209).

Nonetheless, the strategy provides important factual information and enunciates conservation aspirations.

**Relevance to CSD Project**

The Great Barrier Reef Biodiversity Conservation Strategy provides the focus for industry stewardship of the Reef, building ecosystem resilience in a changing climate and improving our knowledge to make more informed decisions and to that extent underpins Ports North's corporate goals.

### B19.22.2.b Reef Water Quality Protection Plan (2013)

**Discussion**

The Reef Water Quality Protection Plan (Reef Plan – State of Queensland.2013) is a collaborative program of coordinated projects and partnerships designed to improve the quality of water in the Great Barrier Reef though improved land management in reef catchments. Its primary focus is diffuse source pollution from broadscale land use. This is pollution that comes from a wide range of different sources and cannot be directly attributed to one point of dispersal, such as a pipe or waste outlet.

It determined that in the Wet Tropics section the GBR, water quality overall was under a very high risk level of risk, mainly from nitrogen (very high risk) but also from pesticides (high risk). The risk level for sediments was considered to be low.

The overall goal of Reef Plan 2013 is:

> to ensure that by 2020 the quality of water entering the reef from broadscale land use has no detrimental impact on the health and resilience of the Great Barrier Reef. (p 20)

Reef Plan sets ambitious but achievable targets for improved water quality and land management practices and identifies actions to improve the quality of water entering the reef. Initially established in 2003, the plan was updated in 2009 and 2013. It details specific actions and deliverables to be completed by 2018 when Reef Plan will be reviewed. To help achieve Reef Plan's goals and objectives, three priority work areas and specific actions and deliverables were identified:

- Prioritising investment and knowledge (prioritise, coordinate and integrate programs to maximise reef water outcomes).
- Responding to the challenge (landholders adopt management systems that maximise reef water quality improvements while maintaining and enhancing resilience, business performance and environmental outcomes. Government policies and programs that support Reef Plan goals and targets are maintained.
- Evaluating performance (the efficiency and effectiveness of Reef Plan is measured through monitoring, evaluation and reporting.)

**Relevance to CSD Project**

The CSD Project responds to the principles of Reef Plan 2013 as it is consistent with management systems that maximise reef water quality improvements while maintaining and enhancing resilience, business performance and environmental outcomes.

### B19.22.2.c GBR Strategic Assessment (2014)

**Discussion**

The GBR Strategic Assessment (GBRMPA 2014a) has been described in detail in **Section B19.5.2** and, along with the companion 2014 Outlook Report (GBRMPA 2014b) provides the structure used in this chapter for the assessment of the CSD Project against MNES. Specifically, in addition to providing useful information on values and threats to relevant Matters of NES, it sets the scene for a region-wide assessment of OUV which

underpins the World Heritage values of the GBR. The report also provides a structure for assessing a development at a specific location within the context of the Great Barrier Reef region as a whole.

It was undertaken as part of the Australian Government's response to the World Heritage Committee's concerns regarding development impacts on the World Heritage Area. The joint mission of the UNESCO World Heritage Centre and International Union for Conservation of Nature, which took place in March 2012, concluded that the Great Barrier Reef continued to demonstrate the OUV for which it was inscribed on the World Heritage List in 1981. However, the mission also noted that the condition of parts of the Great Barrier Reef ecosystem, most notably the inshore areas south of Cooktown, had declined since the time of inscription. Climate change, catchment runoff, coastal development, ports and shipping and direct extractive use were identified as the most important threats to the long-term conservation of the property.

As a result of this process, Australia agreed to undertake a comprehensive strategic assessment of the Great Barrier Reef World Heritage Area, identifying planned and potential developments that could impact on the outstanding universal value of the World Heritage Area, and develop a long-term plan for sustainable development. Other actions included the development of the North-East Shipping Management Plan (see **Section B19.22.2.e**). The following figure extracted from the North-East Shipping Management Plan (Australian Maritime Safety Authority 2014) shows the relationship between these various initiatives arising from the joint mission process. All but the Queensland Ports Strategy are described in this section.


**Figure B19-16** Relationship of the North-East Shipping Plan to other plans and strategies

**Source:** AMSA (2014) Figure 2.

### Relevance to CSD Project

The GBR Strategic Assessment (GBRMPA 2014a) provides the framework for impact assessment in this chapter and in **Chapter B18** (Cumulative Impacts Assessment). It provides an invaluable whole-of-reef statement of values and threats that provide context for assessing individual projects.

## B19.22.2.d GBR Outlook 2014 (2014)

### Discussion

Every five years, GBRMPA prepares an Outlook Report for the GBR to assess overall performance of all measures to protect and manage it in an accountable and transparent manner. The first Great Barrier Reef Outlook Report was released in September 2009 and the second in 2013 (this was updated after community engagement to the 2014 version). According to the document:

> It provides a snapshot of current condition and examines progress in protecting the Reef since 2009. Importantly, it better encompasses the full range of values. It reflects the 2013 amendment of the Regulations which requires explicit assessment of heritage values in future Outlook Reports.

The Outlook Report devoted considerable effort to port activities. According to Reef 2050:

> The Outlook Report 2014 found the direct and flow-on effects of port activities, including dredging and the disposal of dredge material, generally occur in areas that are already under pressure from an accumulation of impacts. While port activities have a significant localised effect, these activities pose a relatively lower threat to the health of the broader World Heritage Area compared to, for example, the broadscale impacts from land-based run-off. (p3)

The following is a summary of findings from the Outlook Report 2014 as quoted in Reef 2050 (Commonwealth of Australia (2015) – see **Section B19.22.2.d**.

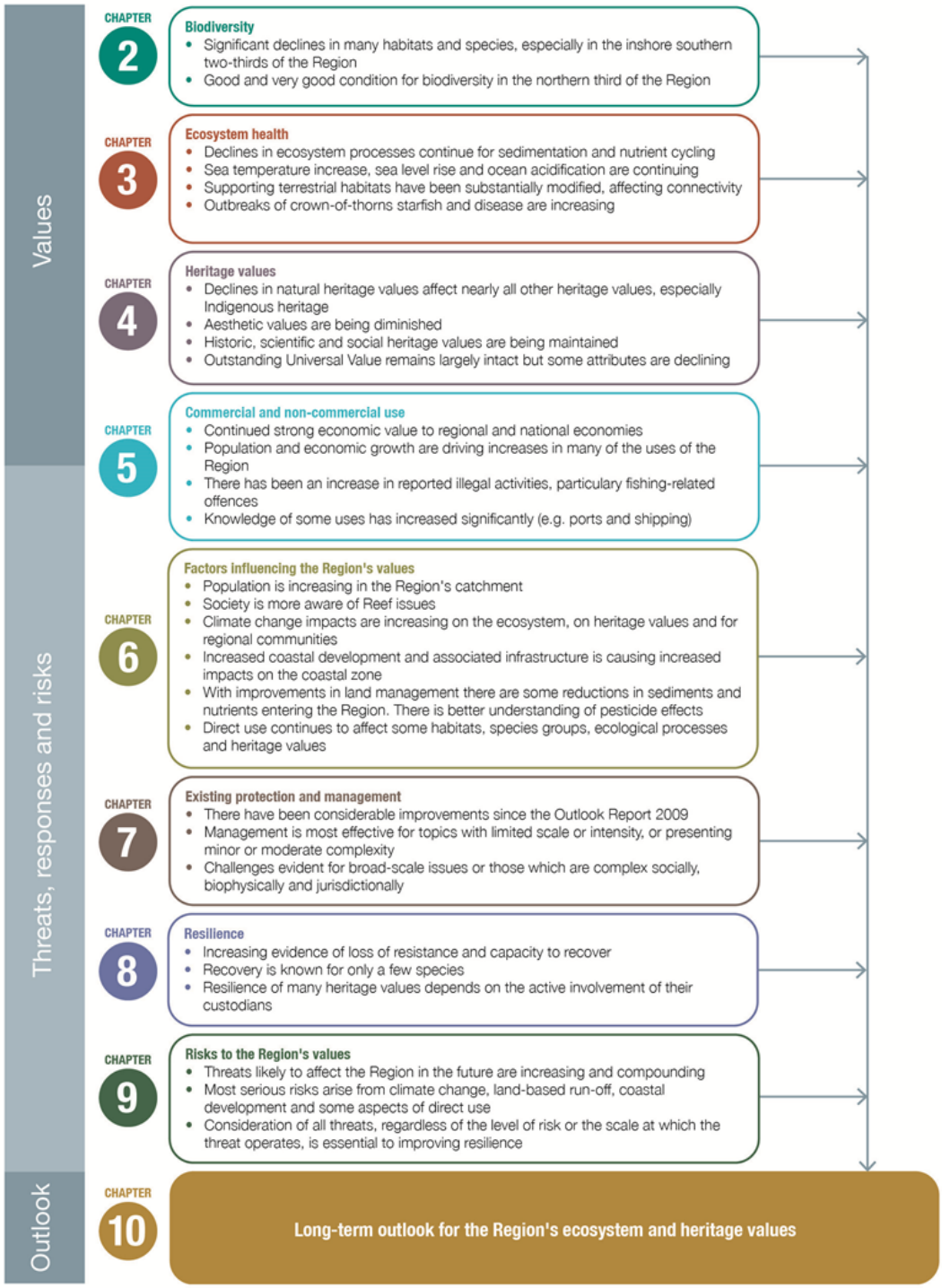



**Figure B19-17** Summary of findings from the Great Barrier Reef Outlook Report 2014.
**Source:** CoA (2015) Appendix C.

### Relevance to CSD Project

As for the GBR Strategic Assessment (GBRMPA 2014a).

## B19.22.2.e North-East Shipping Management Plan (2014)

### Discussion

The North-East Shipping Management Plan was prepared by the Australian Maritime Safety Authority (AMSA 2014). The plan has two main aims:

- To describe measures currently in place to manage the safety of shipping in the sensitive marine environments of Australia's north-east region and propose additional protective measures to further minimise the environmental impacts of these activities in the short, medium and long term.
- To inform the Great Barrier Reef Region Strategic Assessment and the Reef 2050 Great Barrier Reef Long-term Sustainability Plan of the current and proposed measures in place to mitigate known and potential impacts of shipping affecting the Outstanding Universal Value and integrity of the Great Barrier Reef World Heritage Area and other Matters of National Environmental Significance..

As part of the process that resulted in the Strategic Assessment described above, the mission noted that a number of specific impacts of shipping required 'increased attention', including:

- the regulation of shipping traffic including 'boat parks' where numbers of large ships wait at anchor for cargo
- the provision of compulsory and voluntary ship reporting and pilotage
- emergency and pollution response preparedness
- assurance of ship safety
- threats from invasive species imported in ballast waters.

AMSA (2014) includes an assessment of the impacts of shipping and refers extensively to the strategic assessment. It also provides a more detailed assessment of known and potential shipping impacts on MNES and OUV and concludes that:

> Even when operated safely, and in accordance with all legal requirements, shipping may still have an impact on the environment from operational and other routine impacts such as exhaust gas emissions and anchoring. The cumulative effect of these impacts may accumulate in time or interact with other impacts to place additional pressures on an already stressed environment. (p ix)

The management plan includes a number of recommendations and a work program under the following themes:

- Ship safety protective measures
- Navigation safety protective measures
- Environment protection measures
- Preparedness and response protective measures
- Stakeholder engagement.

Actions related to Port Authorities are:

- Port authorities to consider becoming 'Green Award' incentive providers
- MSQ, port authorities and AMSA to continue using risk assessment tools to assess risk due to ship traffic growth and port development, particularly in growth areas such as Abbot Point, Hay Point and Gladstone.
- AMSA to continue to work with government agencies and Queensland port authorities to encourage the improvement and use of waste facilities in line with IMO guidelines and information.
- MSQ, port authorities and AMSA are to ensure they have an adequate number of appropriately trained response personnel that are available to respond to a marine incident.
- Port authorities to maintain harbour towage capacity that has emergency towage capability which can be accessed in an emergency.

**Relevance to CSD Project**

The promulgation of the Northeast Shipping Management Plan by the Australian Maritime Safety Authority as well as other measures will seek to address the additional risk of marine traffic in and around the Great Barrier Reef. This is further discussed in **Chapter B18** (Cumulative Impacts Assessment).

### B19.22.2.f Referral Guidelines for GBR OUV (2014)

**Discussion**

The Department of the Environment (2014) published EPBC Act referral guidelines specifically for the OUV of the GBRWHA. These were designed to complement the 'Significant impact guidelines 1.1 – Matters of National Environmental Significance' (ref) and expand on the concepts of OUV and integrity as well as threats to these attributes of the WHA.

Guidance is provided on impact mitigation, noting that:

> When designing your proposed action, your principal aim should be to avoid impacts on the attributes of the Outstanding Universal Value, including integrity, of the Great Barrier Reef World Heritage Area. (p 20)

**Relevance to CSD Project**

These guidelines have been taken into account in this Revised Draft EIS.

### B19.22.2.g Reef 2050 (2015)

**Discussion**

The Reef 2050 Long-Term Sustainability Plan (Reef 2050) was prepared by the Commonwealth Government (Commonwealth of Australia 2015) as an overarching framework for protecting and managing the Great Barrier Reef from 2015 to 2050. It follows the Australian and Queensland governments' agreement with the UNESCO World Heritage Committee in July 2011 that Australia would undertake a strategic assessment of the Great Barrier Reef and prepare a long-term plan for sustainable development. See GBRMPA (2014a and 2014b).

This Plan will be attached to the Great Barrier Reef Intergovernmental Agreement 2009 as a schedule and overseen by the Great Barrier Reef Ministerial Forum.

Reef 2050 states that the vision for the Great Barrier Reef World Heritage Area is:

> 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. (p33)

The essence of the strategy is to set mid-term objectives of the attributes of Outstanding Universal Value relevant to each theme. These are:

- ecosystem health
- biodiversity
- heritage
- water quality
- community benefits
- economic benefits
- governance.

The following figure shows how Reef 2050 is designed to achieve the vision for the Great Barrier Reef World Heritage Area by building on the current management foundation with actions and outcomes under each of the themes listed above. Combined, this is proposed to 'provide a robust management system for the World Heritage Area, maintain its integrity and protect its Outstanding Universal Value into the future'. (p 34)

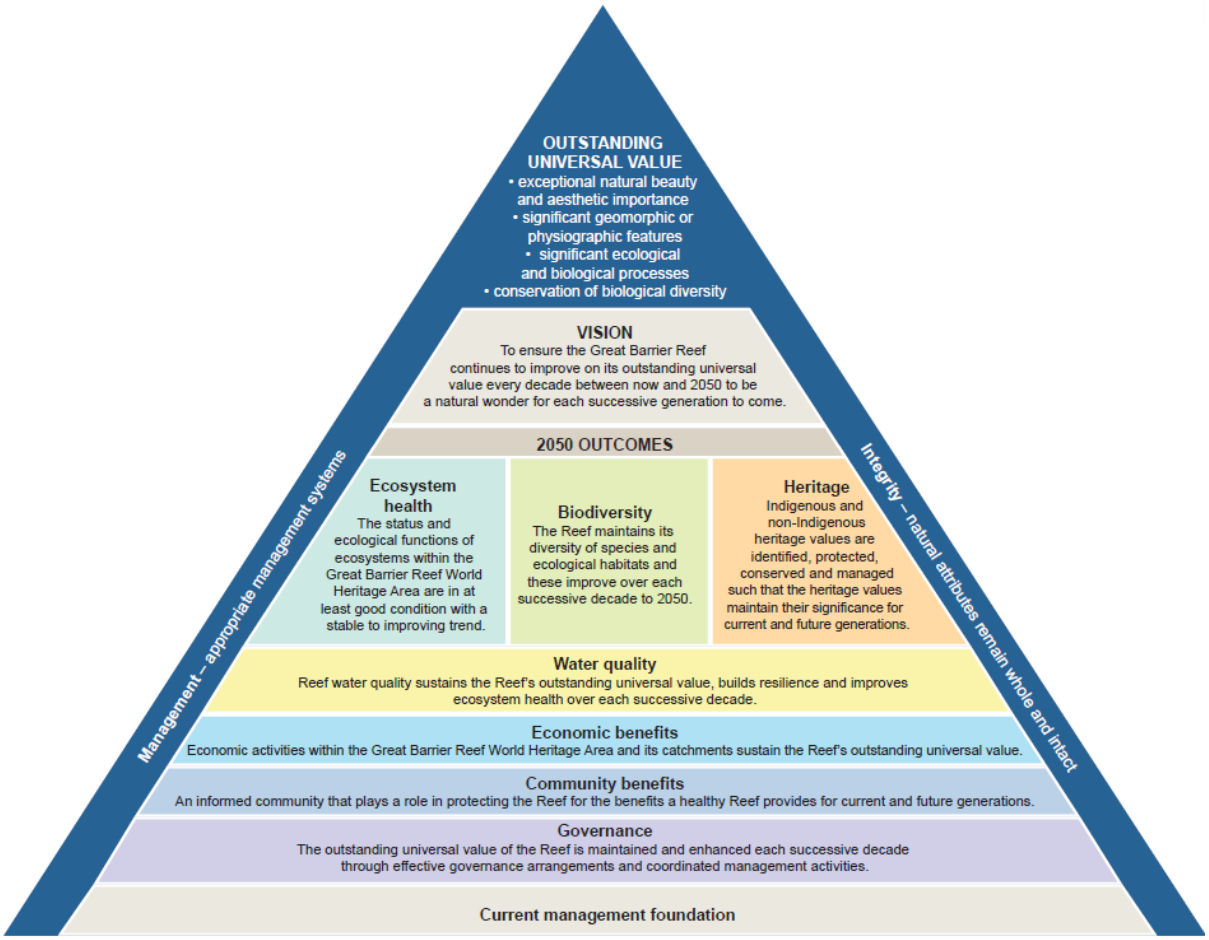



**Figure B19-18** Protecting the Outstanding Universal Value of the Great Barrier Reef World Heritage Area

**Source:** GBRMPA (2015) Figure 4.

Reef 2050 sets out a number of decision-making principles, noting that, in making decisions about management and protection of the World Heritage Area, decision makers will have regard to the principles set out below:

- Maintaining and enhancing outstanding universal value in every action
  - Protecting the outstanding universal value of the World Heritage Area is the prime consideration when planning, development and management decisions are made.
  - Values and ecological processes in poor condition are restored and values and ecological processes in good condition are maintained.
  - Economic growth is sustainable and consistent with protecting outstanding universal value.
- Basing decisions on the best available science
  - Decisions are based on the full range of knowledge, including scientific understanding, Traditional Owner and community knowledge.
  - Decisions take into consideration information on the current and emerging risks associated with climate change.
  - Management is adaptive and continually improving, informed by the outcomes of monitoring programs.

- Delivering a net benefit to the ecosystem:
  - Decisions are underpinned by the principles of ecologically sustainable development, including the precautionary principle.
  - Impacts are avoided and residual impacts mitigated.
  - Offsets are considered only where impacts cannot be avoided or mitigated.
  - Actions that restore ecosystem health and resilience — delivering an overall improvement in the Reef's condition — are fostered.
- Adopting a partnership approach to management
  - Governance arrangements are transparent and accountable.
  - Decisions continue to support a wide range of opportunities for sustainable economic, social and cultural activities, including traditional use.
  - Management is cooperative, fostering stewardship and strong community support.
  - Innovation in management is fostered.

For each theme, Reef 2050 draws on the threats listed in GBRMPA (2014b) and sets actions, targets, objectives and (desired) outcomes.

Of relevance to the CSD Project are the following initiatives:

- Reducing the number of capital dredging proposals to place dredge material in the Great Barrier Reef Marine Park from five to zero.
- Banning disposal of material in the Great Barrier Reef Marine Park from capital dredging projects. This has been extended by the Queensland Government to cover the balance of the World Heritage Area.
- Making the Outstanding Universal Value of the Great Barrier Reef World Heritage Area a central concept in the Australian and Queensland governments' environmental legislation and planning systems. Queensland's planning policy and environmental decision-making system now require explicit consideration of matters protected under Australia's national environment law (including the Outstanding Universal Value of world heritage properties).

Under the water quality theme (Reducing the impact of ports and dredging) the following relevant actions are proposed (some have since occurred):

- WQA14 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.
- WQA15 Develop and implement a dredging management strategy that includes:
  - an examination and, where appropriate, a potential pilot program to evaluate different treatment and re-use options for managing dredge material
  - measures to address dredging-related impacts on Reef water quality and ecosystem health
  - a 'code of practice' for port-related dredging activities.
- WQA16 Develop a State-wide coordinated maintenance dredging strategy which (see **Relevance to CSD Project** below):
  - identifies each port's historical dredging volumes and likely future requirements and limits
  - identifies appropriate environmental windows to avoid coral spawning, seagrass recruitment, turtle breeding and weather events
  - examines opportunities for the beneficial reuse of dredge material or on-land disposal from maintenance activities
  - establishes requirements for risk-based monitoring programs.
- WQA17 Understand the port sediment characteristics and risks at the four major ports and how they interact and contribute to broader catchment contributions within the World Heritage Area (see **Relevance to CSD Project** below).

- WQA18 In 2015 legislate to ban sea-based disposal of capital dredge material in the Great Barrier Reef Marine Park and in the balance of the Great Barrier Reef World Heritage Area from port-related capital dredging (see **Relevance to CSD Project** below).
- WQA19 Mandate the beneficial reuse of port-related capital dredge spoil, such as land reclamation in port development areas, or disposal on land where it is environmentally safe to do so (see **Relevance to CSD Project** below).
- WQA20 The Queensland Government will require all proponents of new dredging works to demonstrate their project is commercially viable prior to commencement.
- WQA21 The Queensland Government will not support trans-shipping operations that adversely affect the Great Barrier Reef Marine Park.
- WQA22 Support on-land disposal or land reclamation for capital dredge material at Abbot Point.

Port operators are identified as 'principal partners' and are required to:

> … manage key environmental values, potential impacts and appropriate avoidance, mitigation and offset measures before new development occurs. Port authorities are also committed to minimising changes in water quality, and are working with partners to inform an integrated approach to water quality monitoring in the Great Barrier Reef. (p 62)

**Relevance to CSD Project**

As for Reef Plan 2013, namely ensure it is consistent with management systems that maximise reef water quality improvements while maintaining and enhancing resilience, business performance and environmental outcomes. Specific management actions are relevant to Ports North as a 'principal partner' as defined above.

As outlined in **Chapter A3** (Project Description) the Reef 2050 actions (WQA18 and WQA19) and subsequent legislative changes are the primary Actions that have resulted in this revised Draft EIS process, whilst WQA14 gave rise to the transitional provisions in the *Sustainable Ports Act* that enabled this EIS process to continue for the Port of Cairns. Ports North, through its involvement with the Queensland Ports Association as facilitated development and implementation of WQA15 and WQA16, and is now assisting in delivering WQA17 which will likewise be directly relevant to long term management of the maintenance dredging aspect of the Project.

WQA16 has resulted in the development of the Maintenance Dredging Strategy for Great Barrier Reef World Heritage Area Ports (TMR 2016) that requires ports to prepare a Long term Maintenance Dredging Management Plan in the near future (approximately one year). Guidelines and approval processes (through the Queensland Government) are being developed and these will provide a long term basis to manage risks of maintenance dredging.

# B19.23 Dealing with Uncertainty

This Revised Draft EIS and the detailed appendices are based on the best information available at the time of writing and commentary is made within the discussion of each element where relevant. With respect to environmental matters, this includes:

- findings of targeted site surveys (terrestrial and aquatic ecology, soils, groundwater, surface water) undertaken during the period between July 2013 and April 2017
- literature research, largely involving previous studies of a range of matters undertaken specifically in the study area and surrounds, as well as more regional data when appropriate
- databases, mapping, and other records available from Government and private sources (it should be noted that the Queensland Government, and Commonwealth Government have invested heavily in recent years to map and otherwise identify biodiversity values. These resources have been extensively relied upon and correlated with local findings)
- personal communications with officers from government agencies, interest groups and associations, and the general public.

Specific details are provided throughout the Revised Draft EIS and in the appendices where relevant. It is believed that the scope and quality of this information is adequate for the purposes of this Revised Draft EIS, namely to support an application for all approvals and also to demonstrate that there are likely to be acceptable environmental impacts and feasible solutions to environmental issues. However, it is recognised that further information is required for a number of purposes to allow the project to progress to construction and operation. These are:

- to verify certain assumptions made in areas where insufficient information exists at present and to demonstrate that the adopted solutions are feasible
- to inform detailed design
- to support post-EIS applications for operational works as required to conduct and operate the development
- to provide a baseline against which changes to the existing environment can be compared and to underpin reactive management strategies to minimise adverse impacts
- to support a formal monitoring and auditing program associated with the above and to allow for continuous improvement in environmental outcomes.

**Chapter C1** (Construction Environmental Management Plan) and **Chapter C2** (Dredge Management Plan) provide details of committed additional seasonal and baseline work respectively.

The formal approach to dealing with uncertainty is included in the concept of Ecologically Sustainable Development (ESD) outlined in **Section B19.2.4**. One of the guiding principles of ESD deals with the precautionary principle expressed as:

> Where there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

The Precautionary Principle is defined almost identically in the EPBC Act as follows:

> Lack of full scientific certainty should not be used as a reason for postponing a measure to prevent degradation of the environment where there are threats of serious or irreversible environmental damage.

The essence of the precautionary principle is that it relates to 'threats of serious or irreversible damage' – this focuses attention on the risk and significance of impacts (and by extension, the significance of the values under threat). In this EIS the precautionary principle is applied to the adequacy of information such that where there is a threat of a serious impact on a matter with a high value, high quality data is required. However, where values are low, or where the risk of serious impacts on these values is low, less stringent standards can apply. Overall, the approach has been that when there is uncertainty on critical matters:

- conservative solutions are proposed
- verification will take place based on higher quality information to be collected specifically for this purpose.

The approval process described in **Chapter A4** (Legislation and Approvals) provides that no actions that could actually impact on values can be taken until such information is collected and specific construction approval sought, this approach is appropriate.

# B19.24 References

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