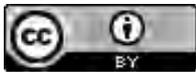


Shute Harbour Marina project:

Coordinator-General's evaluation report on the environmental impact statement

December 2013

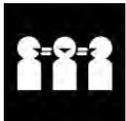
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Synopsis

This report evaluates the potential impacts of the Shute Harbour Marina (SHM) project (the project). It has been prepared pursuant to section 35 of the *State Development and Public Works Organisation Act 1971* (QLD) (SDPWO Act).

The proponent, Shute Harbour Marina Development Pty Ltd, proposes the construction of a \$252 million marina development at Shute Harbour, 10 kilometres (km) south-east of Airlie Beach. The site is situated in the Whitsunday Regional Council (WRC) Local Government Area.

The project as described in the Initial Advice Statement (IAS) (July 2006) was the subject of an environmental impact statement (EIS) released for public comment on 1 November 2008. In response to submissions on that EIS, the proponent revised the scale of the project, reducing the height and number of buildings as well as reducing the number of proposed marina berths from 669 to 395. On 9 February 2009, the Coordinator-General sought additional information on this revised project. This information was provided in the form of a supplementary EIS (SEIS), which was released for public and advisory agency comment on 16 March 2013. This revised project is the subject of my evaluation.

The project comprises a 395-berth marina, a 109-room hotel, and an Indigenous cultural centre and residential community development. It would occupy approximately 25.2 hectares (ha) of land and seabed.

The development is proposed to be constructed in stages over a period of four years. Once completed, occupancy is forecast to be 928 people per day, increasing to approximately 1014 people per day during peak tourism periods. These estimates include:

- around 245 workers on site
- approximately 304 visitors, increasing to approximately 390 during peak periods
- approximately 68 permanent residents
- approximately 300 additional visitors per day using the marina facilities.

In undertaking my evaluation of the EIS, I have considered the EIS and issues raised in submissions, the SEIS and submissions on the SEIS. I have also considered further advice from the proponent, state agencies and WRC.

The following provides an overview of the main issues arising from my evaluation.

Land use

Shute Harbour has an established history of being a site for moorings and an access point to the Whitsunday Islands for barge and ferry traffic. The proponent has a permit to occupy under the *Land Act 1994* for the purposes of 'investigation only'. The proponent's development lease has expired and has not been renewed by the Department of Natural Resources and Mines. Instead, the proponent has been issued with a permit to occupy. This permit expires on 6 January 2014.

The land representing these lots is currently owned by the State.

The site is adjacent to the community of Shutehaven, a small residential area comprising 51 parcels of land. Land contiguous with the western end of the project site is used for marine industry purposes and on the eastern end there is an existing motel and boat ramp. These land uses and the construction of Shute Harbour Road have altered the foreshore in this area.

The project site consists of land, intertidal areas and waters covering a total of 29.3 ha. I have stated a condition that the proponent is not to develop a 4.1 ha portion of the lot north of Shute Harbour Road. The remainder of the lot is available for development leaving a project site area of 25.2 ha. An additional seabed allotment is proposed to be created to accommodate an access channel for the marina. The proposal is broadly consistent with existing land uses for that area within Shute Harbour, and aligns with the strategic intent of the WRC planning scheme that identifies Shute Harbour as a desirable location for marine and tourism based development.

There are a number of potential impacts of the project including:

- reclamation of 7.6 ha of land to construct artificial headlands bordering the eastern and western sides
- excavation of 420 000 cubic metres (m³) of marine sediment from the 17.1-hectare marina basin
- construction of buildings up to five stories high potentially affecting views of the harbour from Shute Harbour Road
- construction impacts (dust, noise, traffic, water quality)
- risk of boat strike of marine fauna
- loss of seabed including areas of seagrass
- lighting impacts on marine and terrestrial fauna.

A draft plan of development was presented in the SEIS. Buildings proposed for the site will be located in a single row on reclaimed land on the north edge of the development and on two artificial headlands to the west and east of the project site. The plan of development for the project sets out the scheduling of the project, and includes measures that will reduce the visual impact of the buildings and infrastructure. The proposed development includes significant areas of open space and public facilities, and preserves public access to the foreshore and vantage points for viewing Shute Harbour and the Whitsunday Islands.

The proposal offers the opportunity to reinvigorate the area and provide an enhanced tourism gateway to the Whitsunday region. The development would also improve resilience of the area to natural disasters by providing a cyclone shelter for marine craft and facilities for emergency services operations.

Economic demand

Public submissions raised concerns about the economic viability of the proposal and the future demand for marina berths in the area. Shute Harbour is primarily a transit point for access to the Whitsunday islands and there are limited facilities compared to Airlie Beach. Airlie Beach has two relatively large marina facilities, both of which include tourist accommodation and retail facilities.

The EIS included an analysis of the economic impact of the project. Assessment of the economic analysis provided by the proponent indicates that the proposal has economic advantages and can support the future demand for recreational boating and tourism facilities in the region. The proposed mix of marina, residential, tourism and retail land uses is designed to provide sufficient commercial opportunities for private sector investment.

Given the planned premium on room rates at the SHM, it appears unlikely that there would be a significant degree of visitor substitution from other accommodation options available in the region.

Infrastructure impacts

The project site is not connected to power and water utilities and has no dedicated sewerage facilities. Existing utilities that service residents and businesses in the area cannot effectively accommodate the additional demand of the SHM project. The supply of water, sewerage mains and waste management for the project would be the responsibility of the proponent. WRC has advised that council will not contribute towards infrastructure costs for the proposal. This matter will be the subject of an infrastructure agreement between the proponent and WRC.

The EIS has assessed the transport impacts on Shute Harbour Road and projected that over 1900 vehicle movements per day would be generated during the operational phase of the project. The project's construction and operational impacts on the road would be mitigated by their commitments to upgrade Shute Harbour Road adjacent to the development. The proponent will also prepare construction traffic management plans. Stated conditions require the proponent to implement all impact mitigation measures necessary to avoid significant adverse impacts on the safety, condition and efficiency of state-controlled and local roads.

Marina basin

A key component of the proposal is a 395-berth marina. Construction of the proposed marina and access channel could cause local turbidity, loss of seagrass, changes to coastal and tidal processes as well as changes to the sedimentation of the seabed environment and changes to water quality, particularly during construction.

To limit potential impacts, the proponent has committed to utilise best practice methods for dredging during both the construction and operation of the project, including silt curtains and a comprehensive water quality monitoring program.

Underwater noise generated during construction, (particularly piling) would be managed by using vibratory or static-hydraulic piling methods during construction of the marina. Stated conditions have been set for the project to avoid the use of piling methods that have unacceptable impacts on marine life. I have stated conditions to monitor underwater noise during construction of the marina and the access channel. My stated conditions for the project include triggers for the cessation of construction activities if noise level limits are exceeded.

The Department of Environment and Heritage Protection (DEHP) advise that the proponent needs develop release criteria to manage water quality during the

construction and operation of the marina. To achieve this, the proponent will need to conduct a water quality monitoring program for 12 months before commencing construction. I have set conditions to ensure that this program monitors water quality for at least a 12-month period, to establish a baseline.

The proposed marina could cause localised changes to current, tide, wave and sediment patterns at and near the marina. During operation, siltation is likely to occur within the marina, and there is potential for impacts on water quality, but the marina has generally been designed to maintain good water circulation and tidal flushing.

The location of the proposed marina and access channel would result in the loss of 12.7 ha that would have been available for seagrass. The EIS suggested that the seagrass is sparse and not likely to support large populations of megafauna. Conditions have been stated to undertake pre-construction surveys and finalise offsets for the impacts of the marina construction and operation on Shute Bay's marine environment.

Matters of national environmental significance

Great Barrier Reef World Heritage property and National Heritage values

The proposed SHM project partially lies within the Great Barrier Reef World Heritage Area (GBRWHA) at Shute Bay and, therefore could affect the aesthetic values and ecosystem processes that underpin the outstanding universal values (OUV) of the world heritage property.

Although Shute Bay is currently a significant development node in the GBRWHA, the project would further alter the aesthetic values of the world heritage property through changes from the natural environment to built form. However, the proposal is broadly consistent with the existing developed character of Shute Bay and the adjacent Coral Point.

Water quality of Shute Bay and the GBRWHA may be impacted by the project during construction and operation. Construction activities such as earthworks and dredging may result in increased suspended sediment concentrations in Shute Bay. During operations, boating and fuelling activities may result in pollutants entering Shute Bay. These impacts will be managed and mitigated through erosion and sediment controls and spill prevention control measures.

Marine habitat to be cleared includes 12.7 ha of seagrass that provides food for green turtles and dugongs. Loss of this seagrass is not considered to be a critical impact on marine fauna habitat, given the extensive areas of seagrass meadows that are protected at Edgecumbe Bay and Repulse Bay dugong protection areas to the north and south of the project site respectively.

Threatened species and migratory fauna

A Proserpine rock-wallaby population of unknown size inhabits the Conway National Park to the north of the project site. During the dry season when foraging resources in the national park are limited, some individuals forage on guinea grass along road verges. The risk of road strike incidences involving Proserpine rock-wallabies increases

at this time of the year. It is anticipated that increased road traffic associated with the project could further increase the risk of collision with the Proserpine rock-wallaby along Shute Harbour Road. Queensland Parks and Wildlife Service (QPWS), in collaboration with the Department of Transport and Main Roads (DTMR), is working to manage vegetation along road verges to minimise traffic impacts on the Proserpine rock-wallaby. The proponent has made a commitment to work with QPWS and DTMR to reduce impacts on the Proserpine rock-wallaby and an offset is required to compensate for significant residual impacts.

Marine megafauna, including turtles, dugongs (migratory, EPBC Act) and estuarine crocodiles (migratory, EPBC Act) have been recorded in Shute Bay. Humpback whales (vulnerable and migratory, EPBC Act) are known to use the Whitsunday passages beyond Shute Bay. These species of marine megafauna are at risk of boat strike from boating activity, and underwater noise from pile driving and dredging activities during construction of the project. The risk of injury or fatality from boat strike impacts is likely to increase with additional boating traffic through Shute Harbour and the Whitsunday region, due to the project.

The proponent has proposed to utilise two low-impact pile driving options that generate only low levels of underwater noise, thus reducing underwater noise impacts on marine species. A cutter suction dredge, which also results in low levels of underwater noise, will be used to dredge the access channel. I have concluded that underwater noise impacts on marine species during dredging activities are not unacceptable.

Commonwealth marine areas

The key impact on Commonwealth marine areas as a result of the project is boating activity. The project will have the potential to generate 395 additional marine vessels using the Great Barrier Reef. Most of these boats are expected to travel within a short distance of the SHM to the Whitsunday Islands. Very few boats are expected to travel into Commonwealth marine areas. However, boats that do travel into Commonwealth marine areas may impact on marine fauna through boat strike, though the risk is low.

Mitigation and Offsets

Conditions have been stated in this report that require preconstruction surveys to finalise offsets for significant residual impacts on EPBC listed marine species. Surveys are required for terrestrial and marine matters. A final offset proposal must be presented to the Coordinator-General and DOTE for approval following further detailed investigations. I note the proponent has advised that project construction will not commence prior to DOTE's approval of the project's offset plan.

Conclusion

I consider that the environmental impact assessment requirements of the SDPWO Act for the SHM project have been met and that sufficient information has been provided to enable a thorough evaluation of the potential impacts of the project.

I conclude that there are local, state and national benefits to be derived from the development, and that any adverse environmental impacts can be acceptably avoided, minimised, mitigated or offset through the implementation of the proponent's mitigation

measures and commitments outlined in the EIS documentation. My conditions and recommendations in this report have been formulated in order to further manage all impacts associated with the project.

Accordingly, I approve the project to proceed subject to the conditions and recommendations set out in the appendices of this report. In addition, it is expected that the proponent's commitments will be fully implemented.

This report will be provided to the Commonwealth Minister for the Environment, pursuant to section 36(2) of the SDPWO Regulation and the bilateral agreement between the State of Queensland and the Australian Government to support a decision on the controlled actions for this project pursuant to section 133 of the EPBC Act.

A copy of this report will also be provided to the proponent, GRC and relevant state government agencies, and will also be made publicly available at:
www.dsdip.qld.gov.au/shute-harbour-marina



.....
Barry Broe
Coordinator-General

9 December 2013

1. Introduction

This report has been prepared pursuant to section 35 of the *State Development and Public Works Organisation Act 1971* (Qld) (SDPWO Act) and provides an evaluation of the environmental impact statement (EIS) for the Shute Harbour Marina (SHM) project (the project).

The report:

- summarises the key issues associated with the potential impacts of the project on the physical, social and economic environments at the local, regional state and national levels
- presents an evaluation of the project, based on information contained in the EIS, supplementary EIS (SEIS), submissions made on the EIS and information and advice from advisory agencies and other parties
- describes the measures required to avoid, mitigate or offset project impacts
- states conditions under which the project may proceed
- documents proponent commitments.

2. About the project

2.1. The proponent

The proponent for the project is Shute Harbour Marina Development Pty Ltd. The company share structure is comprised of two classes of shares; Class A and Class B.

Class A shareholders are represented by Mark Daniels, Mark McLachlan, Colin Crossley, Gregory Phillips, William Kelly, Geoff Inglis, David Inglis, David Wade and John Robinson.

Class B shareholders are represented by Port Binnli Shute Harbour Pty Ltd.

2.2. Project description

Shute Harbour Marina Development Pty Ltd has proposed to construct an integrated marina, resort hotel and residential community development at Shute Harbour, 10 kilometres (km) south-east of Airlie Beach. The project site is adjacent to the Great Barrier Reef Marine Park (GBRMP).

2.2.1. Location

The project will take place in Shute Harbour, part of the Whitsunday Regional Council (WRC) area. Leases associated with this project are:

- Lot 2 SP117389
- proposed Lot A on drawing 13/512/CEN (refer to Appendix 8).

As per plans submitted by the proponent the majority of Lot 2 north of Shute Harbour Road and Lot 273 on HR1757 in its entirety will not be developed except where required for any widening of Shute Harbour Road itself.

The SHM project site as shown in Figure 2.1 covers an area of 25.2 hectares (ha) and is bordered by:

- Shute Harbour Road to the north
- Conway National Park beyond Proserpine Shute Harbour Road to the north, north-east and north-west
- an existing motel and the existing Shute Harbour Ferry Terminal to the east
- open water of Shute Bay to the south
- an existing dwelling and a marine salvage operation to the west.

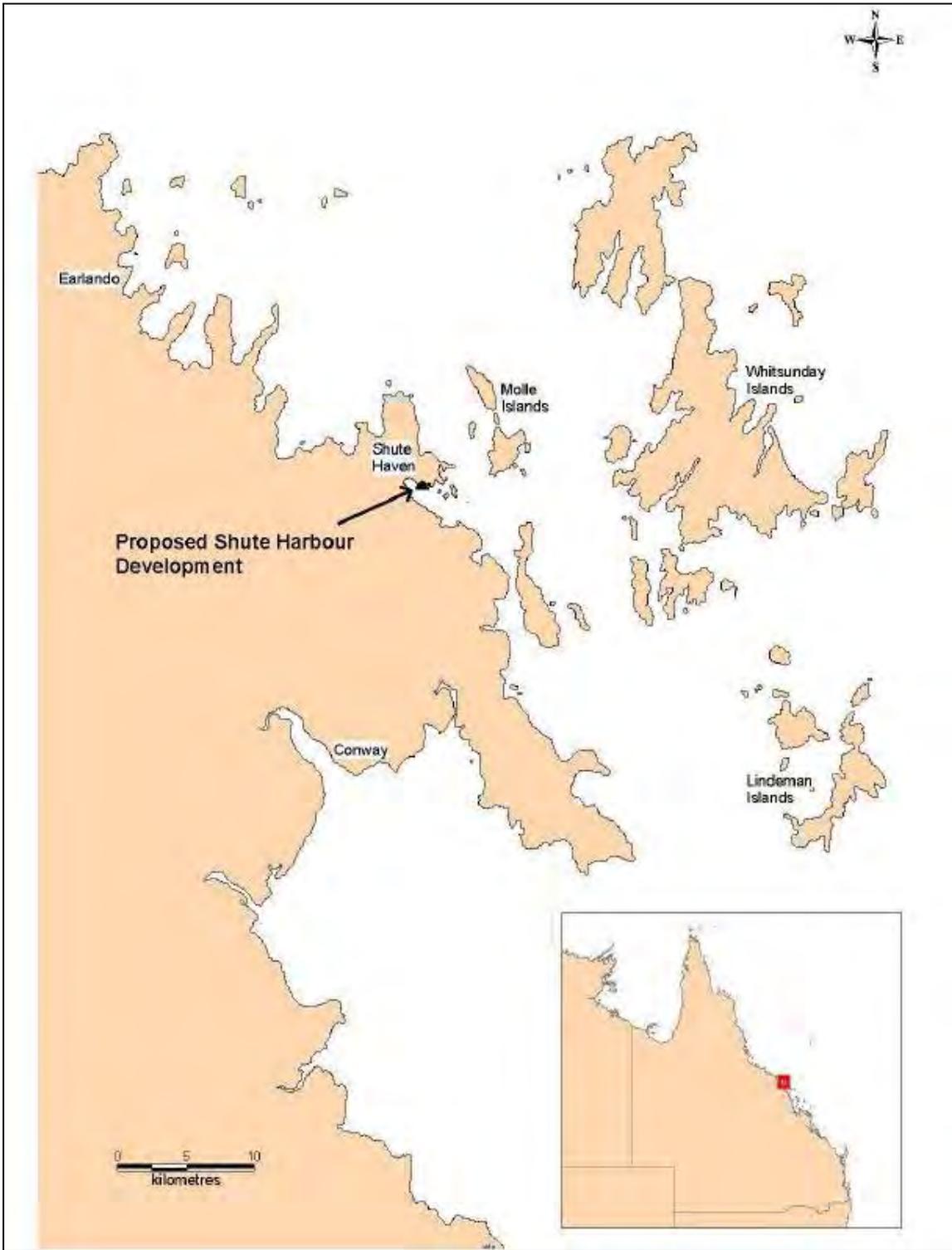


Figure 2.1 Site location in the Whitsunday region

2.2.2. Project components

Key elements of the project as described in the EIS and SEIS include the following:

- 395 marina berths
- resort hotel comprising 109 suites and serviced apartments
- retirement resort comprising 70 apartments and leisure centre
- 49 managed resort dwelling lots
- ground level and underground parking integrated into the building design
- Indigenous cultural interactive centre showcasing the local Indigenous culture of the Gia and Ngaro people
- emergency services centre comprising sea rescue and emergency services and a community cyclone shelter
- a sailing club, charter boat base, retail, supermarket, cafes and restaurants
- marina facilities: administration, chandlery and a marine education facility
- publicly accessible walkways and pathways at the water's edge, public amenities, seating and signage .

The project components are described in Development Plan 2106 SEIS P64 shown in Figure 2.2.

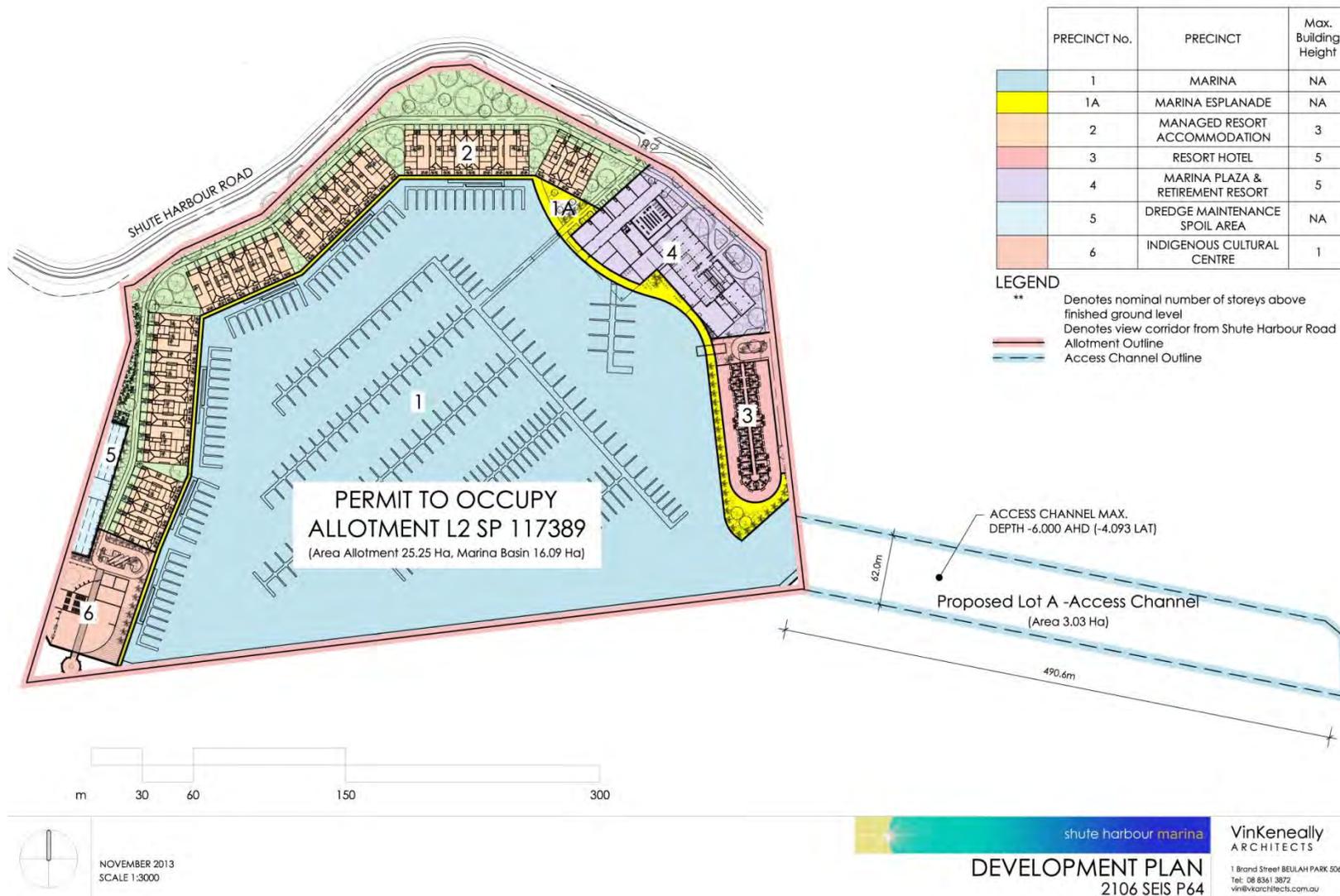


Figure 2.2 Shute Harbour Marina Resort Development Plan

About the project
 Shute Harbour Marina project:
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2.2.3. Development stages

Information provided by the proponent indicates that construction will commence in 2014, with completion scheduled for 2018. Construction will take place over several phases during this period, covering separate elements of the marina resort as shown in Table 2.1.

Table 2.1 Proposed project development stages and timelines

Development stage	Phase
Base civil and site establishment, including dredge maintenance area and marina	1
Indigenous Cultural Interactive Centre, emergency services, sea rescue and cyclone shelter, shopping and marina services	2
Managed resort accommodation, resort hotel	3

2.3. Project rationale

The EIS provides a list of benefits expected from the proposed development:

- employment opportunities during construction (107 full-time equivalent (FTE)) and operation (245)
- development of a safe boating harbour for protection during cyclones
- development of a community cyclone shelter for residents, boat operators, tourists and visitors
- increased marine habitat from development of the artificial headlands and the marina infrastructure
- re-establishment of seagrass from removal of swing moorings
- funding for a Reef Conservation Fund
- development of an Indigenous cultural centre showcasing local Indigenous art and craft, providing a depository and safe storage for existing cultural artefacts, providing a business and employment opportunity for the local Indigenous communities
- providing a catalyst for revitalisation of Shute Harbour, which is in decline.

2.3.1. Economic

The expected economic impacts of the project were the subject of a number of public submissions for and against the project.

Economic issues around this project include:

- suitability of the project for its region
- economic impacts of the project in construction and operation
- existing levels of market demand for the elements of this development.

Regional profile

The Shute Harbour Marina project is entirely located in the Whitsunday region of Queensland, and therefore the Whitsunday region is where the net economic benefits of this project would be concentrated.

As at 30 June 2012, the estimated resident population of Whitsunday Regional Local Government Area (LGA) was 33 295 persons. The annual growth rate in the region between 2011 and 2012 was 2.7 per cent. This is greater than the Queensland population growth rate in the same period of 1.9 per cent.

The most recent workforce statistics¹ for Whitsunday LGA show an unemployment rate of 6.1 per cent, somewhat higher than the Queensland rate of 5.8 per cent as at December 2012.

The most significant industries to the Whitsunday region (by percentage of all employees) are accommodation and food services (14.8 per cent) retail trade (10.3 per cent) and construction (10.2 per cent).²

The unemployment rate of 6.1 per cent in December 2012 represents 1239 unemployed persons in the Whitsunday region, indicating there may be opportunities to employ currently unemployed persons at the SHM project.

Employment opportunities for the region arising from this project are:

- during construction, a peak of 107 FTE workers
- during operation, 245 staff with a majority proposed to be drawn from the region.

Marina berth demand

Boating is an important component of the tourism industry in the Whitsunday area. There are marinas already in operation in the Whitsunday region. Table 2.2 shows marina in the Whitsunday Region, and the number of berths those marinas provide.

Table 2.2 Existing Whitsunday marinas and current proposed marina

Marina	Berths
Abel Point	467
Hamilton Island	245
Hayman Island	26
Port of Airlie	73
Total Whitsunday Region	811
<i>Shute Harbour (proposed)</i>	395
Total Whitsunday Region after this project	1206

¹ Unemployment data from OESR using DEEWR, Australian Government Department of Education, Employment and Workplace Relations, *Small Area Labour Markets Australia*, various editions

² Employment source OESR using data from Australian Bureau of Statistics, *Census of Population and Housing, 2011*, Basic Community Profile - B43

About the project

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A demand study was provided subsequent to the SEIS public consultation in response to issues raised in public and agency submissions. The study forecast demand for an additional 334 wet berths and swing moorings in the Mackay and Whitsunday regions by 2018 on a medium-low growth model. The marina resort will not offer swing moorings, and separate figures for wet berths alone were not given. This figure includes demand during the peak boating season, which in the project region is from May to October each year.

The proponent proposes to sell 395 marina berths by the close of the marina construction phase in 2016 at an average price of \$215 190 with a 99-year freehold lease.

Berths are provided for a number of vessels with hulls 10 m and greater, with a majority of berths aimed at vessels 16 m in hull length or more. The breakdown of the 395 berths is shown in Table 2.3.

Table 2.3 Berths in the proposed marina, by hull size

Vessel hull size	Available berths
10m	3
12m	53
14m	1
16m	166
18m	28
20m	31
20m (catamaran hull)	16
22m	83
25m	10
27m	4

The Department of Transport and Main Roads (DTMR) publishes a recreational vessel census. The most recent census was published in September 2012 and shows 579 recreational vessels with hulls of 10 metres (m) or greater registered in the Mackay region (which includes the Whitsundays). For Queensland, annual growth in vessels of 10 m or more in length in Queensland to June 2012 was 0.5 per cent, and the growth average is 1.7 per cent per year over the five years to 2012.³ This could account for around 60 additional vessels in the Mackay region to 2018.

There will be an element of competition between these marinas for berth occupancy. I note that a proportion of the berths at SHM are allocated to specific functions of the resort. Forty-nine berths have been allocated to the 49 managed lots and 35 berths are allocated to guests in retirement accommodation. A further 30 berths are allocated to hotel guests. In this way, the impact of having a large number of marina berths released to the market will be lessened.

³ Vessel ownership data from Recreational Vessel Census June 2012, released September 2012 by Department of Transport and Main Roads

Accommodation demand

Data on accommodation rates in the Whitsunday region shows an average room occupancy rate of 51 per cent from October 2008 to March 2012.⁴ The EIS asserted that SHM could maintain a 60 per cent occupancy rate due to superior features in respect of other accommodation available nearby.

2.3.2. Tourism

Visitors to the Whitsunday region totalled 750 924 in 2011–12, excluding domestic day-trippers. This total includes 590 000 domestic overnight visitors and 160 924 international visitors.⁵

This represents a rise in visitors since 2009, though the total is below the high of 815 274 visitors achieved in 2006–07. Also noted in the most recent year is the fall in the number of international visitors to the Whitsunday region to the lowest level in the 13-year period, as shown in Figure 2.3.

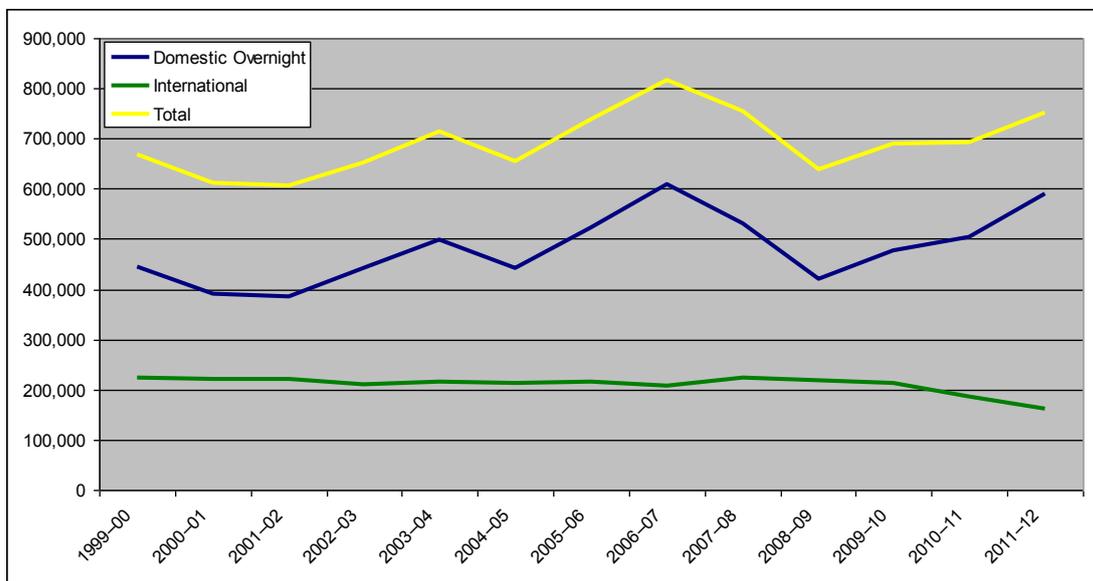


Figure 2.3 International and domestic overnight visitors to Whitsunday Region, 1999–2012

Information provided by the proponent forecasts 88 400 visitors to Shute Harbour Marina per annum. This represents 11.77 per cent of visitors to the Whitsunday region in 2011–12.

⁴ Whitsunday room occupancy data from the Cost-Benefit Analysis conducted by AEC Group, January 2013

⁵ Tourism Research Australia, downloaded from OESR website <http://www.oesr.qld.gov.au/subjects/industry-development/tourism/tables/domestic-visitors-qld-tourism-region/index.php> and <http://www.oesr.qld.gov.au/subjects/industry-development/tourism/tables/internat-visitors-qld-tourism-region/index.php>

2.4. Coordinator-General's conclusions

The proposed development will be at no cost to the state with \$252 million of private sector investment used to fully fund construction. The expected economic benefits in terms of increased visitors to the region, and employment opportunities are sufficient to justify this project. Positive economic impacts, including opportunities for local suppliers can be realised through local purchasing strategies, which the proponent has committed to creating and implementing (Appendix 5, C64 and C65). Positive economic impacts through increased employment and local employment strategies are anticipated.

3. Impact assessment process

3.1. Overview

This section details the steps in the project's EIS assessment process. For a detailed explanation of the EIS process, refer to www.dsdip.qld.gov.au/coordinator-general

In undertaking this evaluation, I have considered the following:

- initial advice statement (IAS)
- EIS
- issues raised in submissions relating to the EIS
- additional information
- technical reports
- agency advice from:
 - Commonwealth Department of the Environment
 - Department of Agriculture, Fisheries and Forestry
 - Department of Environment and Heritage Protection
 - Department of National Parks, Recreation, Sport and Racing
 - Department of Natural Resources and Mines
 - Department of State Development, Infrastructure and Planning
 - Department of Tourism, Major Events, Small Business and the Commonwealth Games
 - Department of Transport and Main Roads
 - Public Safety Business Agency
 - Queensland Health
 - Queensland Police Service
 - Whitsunday Regional Council
- comments and properly made submissions⁶ from members of the public.

Table 3.1 shows the steps taken in the project's EIS process.

⁶ For a definition of a 'properly made submission', refer to the Glossary.

Table 3.1 Overview of EIS process

Date	Process
6 July 2006	Final IAS and request for project declaration received
24 July 2006	Project declared a 'coordinated project' by Coordinator-General
27 July 2006	Australian Government determined project is a 'controlled action'
25 October 2006	Submission period on draft terms of reference (TOR) commenced
27 November 2006	Submission period on draft TOR closed
15 June 2007	TOR finalised
24 October 2008	EIS provided to Coordinator-General for evaluation
1 November 2008	EIS released for public and agency comment
15 December 2008	Submission period on EIS closed
9 February 2009	Additional information sought
6 August 2012	Additional information provided to Coordinator-General for evaluation
16 March 2013	Additional project information available for public and agency comment
29 April 2013	Submission period on additional information closed
16 September 2013	Additional information provided to Coordinator-General for evaluation
28 October 2013	Additional information provided to Coordinator-General for evaluation
11 November 2013	Additional information provided to Coordinator-General for evaluation

3.2. Coordinated project declaration

On 24 July 2006, the Coordinator-General declared this project to be a 'coordinated project' under section 26(1)(a) of the Queensland SDPWO Act. This declaration initiated the statutory environmental impact evaluation procedure of Part 4 of the Act, which required the proponent to prepare an EIS for the project.

The SDPWO Act was amended in 2012 (with the amendments taking effect on 21 December 2012). The amendments have renamed 'significant project' to 'coordinated project'. The project will be referred to as a coordinated project throughout this evaluation report.

3.3. Controlled action

On 27 July 2006, the Commonwealth Environment Minister determined that the project is a 'controlled action'⁷ under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) (EPBC Act).

The relevant controlling provisions under the EPBC Act are:

- sections 12 and 15(a) world heritage properties
- sections 18 and 18(a) listed threatened species and ecological communities

⁷ For a definition of 'controlled action', refer to the Glossary on page 200 of this report.

- sections 20 and 20(a) migratory species protected under international agreements
- sections 24 and 24A Commonwealth marine areas.

A bilateral agreement exists between the Australian and Queensland governments that allows the Queensland Government to conduct the EIS assessment process to meet the needs of both jurisdictions. Section 7 of this report (Matters of national environmental significance) lists each controlling provision under the EPBC Act and explains the extent to which the Queensland Government EIS process addresses the actual or likely impacts of the project on the matters covered by each provision.

The Queensland Government has completed the assessment of matters of national environmental significance under the EPBC Act, on behalf of the Commonwealth Department of the Environment (DOE). This report provides the assessment of all environmental matters during the EIS process for both the State and Commonwealth jurisdictions. The Commonwealth Environment Minister will use the information in this report to determine whether or not to approve the project under the EPBC Act.

3.4. Terms of reference

The draft terms of reference (TOR) for the EIS for the proposed project was released for public and advisory agency comment from 25 October to 27 November 2006. Twenty-two submissions were received, comprising 13 from advisory agencies, 4 from non-government organisations and 5 from public submitters.

A final TOR was prepared having regard to submissions received and was issued to the proponent on 15 June 2007.

3.5. Review of the EIS

The EIS, prepared by the proponent, was released for public and agency comment from 1 November to 15 December 2008.

A total of 333 submissions were received, copies of which were forwarded to the proponent and the then Australian Department of Sustainability, Environment, Water, Population and Communities.

Public submissions in favour of the project mentioned issues relating to employment and cultural space for Indigenous people, meeting current and future demand for marina berths, and stimulating the local and regional economy.

Public submissions against the project raised issues relating to the protection of views along Shute Harbour Road, water quality impacts on flora and fauna in Shute Harbour, traffic and parking impacts along Shute Harbour Road, and questioning the need for additional marina berths.

Table 3.2 summarises the number of public and agency submissions on the EIS. For an assessment of the environmental impacts of this project, refer to Section 5 of this report.

Table 3.2 Public and agency comments received on the EIS

Agency	No. submissions	Issue
Queensland Government <ul style="list-style-type: none"> • Department of Communities • Department of Housing • Department of Infrastructure and Planning • Department of Main Roads • Department of Natural Resources and Water • Department of Primary Industries and Fisheries • Department of Tourism, Regional Development and Industry • Environmental Protection Agency • Queensland Health • Queensland Transport 	10	<ul style="list-style-type: none"> • Air quality • Boat ramp funding • Coastal processes • Construction traffic • Cultural heritage • Development code • Maritime traffic safety • Mosquito management • Population impacts • Social impact mitigation • Stormwater management • Tenure • Transport accessibility
Australian Government <ul style="list-style-type: none"> • Department of Sustainability, Environment, Water, Population and Communities 	1	<ul style="list-style-type: none"> • Marina demand • Marine ecosystem • Marine fauna • Migratory species • Offsets • World Heritage values
Local Government <ul style="list-style-type: none"> • Whitsunday Regional Council 	1	<ul style="list-style-type: none"> • Development code • Infrastructure • Marine ecosystem • Stormwater management
Private organisations/community groups <ul style="list-style-type: none"> • Save Our Foreshore • Mackay Conservation Group • Shutehaven Residents Association 	3	<ul style="list-style-type: none"> • Acid sulphate soils • Calculation of net benefit assessment • Demand for premium accommodation • Dredging • Inconsistent with WRC planning scheme • Questionable demand for marina berths • Stormwater management • World heritage values

Agency	No. submissions	Issue
Private individuals	318	<ul style="list-style-type: none"> • Impacts on seagrass • Impacts to visual amenity • Maritime traffic safety • MNES • Net loss of mangroves • Potential for boat strike • Questionable demand for marina berths • Road traffic and congestion • Water quality
TOTAL	333	

3.6. Additional information

On 9 February 2009, I requested that Shute Harbour Marina Development Pty Ltd submit additional information to address issues raised in the EIS process by agencies and by public submissions.

Table 3.3 summarises the public and agency submissions on the additional information provided by the proponent. For an assessment of the project's key issues and potential impacts, refer to Section 5 of this report.

Table 3.3 Submissions received on additional project information

Agency	No. submissions	Issue
<p>Queensland Government</p> <ul style="list-style-type: none"> • Department of Aboriginal and Torres Strait Islander and Multicultural Affairs • Department of Agriculture Fisheries and Forestry • Department of Community Safety • Department of Environment and Heritage Protection • Department of National Parks, Recreation, Sport and Racing • Department of Natural Resources and Mines • Department of State Development Infrastructure and Planning • Department of Tourism, Small Business Major Events and the Commonwealth Games • Department of Transport and Main Roads • Queensland Health • Queensland Police Service 	<p>11</p>	<ul style="list-style-type: none"> • Cultural heritage management plan • Dredging • Emergency management plan • Impacts on seagrass • Increased usage of marine and national parks • Marine ecology • Marine pollution • Maritime traffic safety • Mosquito management • Offsets • Proserpine rock-wallaby • Questionable demand for accommodation • Questionable demand for marinas • Road infrastructure • Tenure • Traffic management
<p>Australian Government</p> <ul style="list-style-type: none"> • Department of Sustainability, Environment, Water, Population and Communities 	<p>1</p>	<ul style="list-style-type: none"> • Marina demand • Marine ecosystem • Marine fauna • Migratory species • Offsets • Proserpine rock-wallaby • World Heritage values
<p>Local Government</p> <ul style="list-style-type: none"> • Whitsunday Regional Council 	<p>1</p>	<ul style="list-style-type: none"> • Development code • Environmental Management Plan • Infrastructure • Marine ecosystem • Mosquito management • Stormwater management • Traffic management

Agency	No. submissions	Issue
Private organisations/community groups	8	<ul style="list-style-type: none"> • All risk—no benefit to the community • Lack of accuracy • Marine ecology • Maritime traffic safety • No proof of need • Questionable social benefits • Road traffic • Spoil disposal • Water quality • World heritage values
Private individuals	1101	
TOTAL	1122	

4. Project approvals

Following the release of this evaluation report, Shute Harbour Marina Development Pty Ltd will need to obtain a range of subsequent statutory approvals from Commonwealth and Queensland governments, as well as the WRC before the project can be developed.

Due to the location of the site, its design and assessment is subject to a range of Commonwealth, State and local legislation, plans and policies. These legislative instruments provide detailed guidance as to the manner in which any development may be undertaken and the criteria that need to be considered in order to do so.

The likely approvals or permits, approving agencies and associated legislation are listed in sections 4.1–4.3.

4.1. Local government approvals

The project development site is located wholly within the WRC area. WRC will be the assessment manager for local government approvals required for this project. Further information is provided in Section 5.1.4 ('Relevant state and local government planning').

4.2. State government approvals

The principal statutory approvals necessary for the development of the project, subsequent to this EIS evaluation include:

- preliminary material change of use to affect the Planning Scheme under Section 242 of the *Sustainable Planning Act 2009* (SPA)
- development permit for operational works under SPA in conjunction with other legislation including:
 - tidal works, reclamation and works within a coastal management district—*Coastal Protection and Management Act 1995*
 - to remove, destroy or damage marine plants, or to construct or raise waterway barrier works—*Fisheries Act 1994*
- environmental authority for environmentally relevant activity (ERA)—SPA, *Environmental Protection Act 1994* (EP Act) ERA 16—extractive activities—dredging
- material change of use that exceeds the threshold of 50 dwellings and/or accommodation units, 4000m² of GFA in Schedule 11, column 3 of *Sustainable Planning Regulation 2009*—*Transport Planning and Coordination Act 1994*.

4.2.1. Cultural Heritage Management Plan

Pursuant to section 87 of the *Aboriginal Cultural Heritage Act 2003* (ACH Act), the proponent must have an approved Cultural Heritage Management Plan (CHMP) for the project. The proponent has developed the project's CHMP in consultation with local Indigenous representatives. The CHMP is attached to the SEIS document as appendix GS5. It remains a draft pending final approval of all Indigenous representatives.

4.2.2. Environmental management plans

This section of the report provides an overview of the environmental management plans (EMPs) for the project.

Appendix I3, P2, S2 and U2 of the EIS and Volume one, Chapter seven of the proponent's additional project information provided draft EMPs for all components of the project. The EMPs become the key reference documents that convert the undertakings and recommendations of the environmental studies into actions and commitments to be followed by the designers, construction operators and subcontractors of the proposed project. The EMPs specify:

- proposed environmental management strategies, actions and procedures to be implemented to mitigate adverse impacts and enhance beneficial environmental and social impacts
- monitoring, reporting and auditing requirements
- the entity responsible for implementing proposed actions
- proposed timing
- corrective actions if monitoring indicates that performance requirements have not been met.

The EMPs will be further refined and expanded after this report is finalised, during the detailed design phase of the project and through ongoing consultation with the relevant advisory agencies.

Effective implementation of the EMPs will satisfy the commitments made by the proponent in the EIS, additional information, and in correspondence with members of the public and advisory agencies; and will ensure environmental impacts of the project are managed.

The proponent has prepared the following EMPs:

- Construction Environmental Management Plan (CEMP)
- Acid Sulfate Soils Management Plan (ASSMP)
- Marina Site-Based Management Plan (Marina SBMP)
- Stormwater Management Plan (SMP)
- Waste Management Plan (WMP)
- Marine Megafauna Impact Assessment and Management Plan (MMMP).

4.2.3. Construction Environmental Management Plan

The CEMP provides mechanisms in which the environmental performance of the Shute Harbour Marina construction works can be measured and if required, provides procedures for identifying and implementing corrective actions.

Topics addressed in the CEMP include:

- community awareness
- earthworks management
- dredging
- erosion and sediment control
- water quality
- acid sulfate soil management
- aquatic and terrestrial ecology
- marine megafauna
- air quality
- noise and vibration
- waste management
- dangerous and hazardous materials
- cultural heritage management
- traffic (including navigation)
- visual amenity.

4.2.4. Acid Sulfate Soils Management Plan

The ASSMP has been designed to ensure that no significant adverse impacts on the receiving environment occur as a result of the disturbance of actual or potential acid sulfate soils.

This ASSMP has been prepared with reference to the following guidelines:

- *Queensland Acid Sulfate Soil Technical Manual – Soil Management Guidelines, Version 3.8* (Queensland Government, November 2002)
- Queensland Government State Planning Policy 2/02 Version 2– Planning and Managing Development involving Acid Sulfate Soils (SPP 2/02)
- *Instructions for the Treatment and Management of Acid Sulfate Soils* (Queensland Government, July 2001)
- *Acid Sulfate Soils Management Plans for Queensland* (Dear et al, June 2000)
- *Guidelines for Sampling and Analysis of Lowland Acid Sulfate Soils in Queensland* (CR Ahern, MR Ahern and B Powel, October 1998).

4.2.5. Marina Site-based Management Plan

The Marina SBMP has been designed for Environmentally Relevant Activity 16—Extractive and screening activities (dredging) associated with the Shute Harbour Marina, and provides an overarching framework for best practice environmental management for other ERAs that may be undertaken within the Shute Harbour Marina.

The purpose of the Marina SBMP is to demonstrate the environmental commitment by the proponent to carry out their activities in accordance with a structured program that:

- sets the environmental objectives or standards to be achieved over time
- identifies the potential environmental harm and extraordinary factors that may cause environmental harm resulting from routine operations and establishes and documents measures to avoid and/or manage this harm as far as practicable
- ensure all persons carrying out the activity are aware of environmental risks, and are trained in the measures and contingency plans to deal with them
- implements monitoring of environmental performance to ensure the effectiveness of the measures and contingency plans
- assists the communication of environmental information throughout the organisation and to the administering authorities
- provides for continual improvement.

4.2.6. Stormwater Management Plan

The SMP provides details for the stormwater quality and quantity management of the proposed Shute Harbour Marina prior to discharge entering Shute Bay.

This report specifies the recommended Environmental Values (EVs) and Water Quality Objectives (WQOs) for the site and details conceptual stormwater quality treatment measures to ensure appropriate pollutant levels are achieved from the site runoff, including environmental monitoring for long-term management of coastal waters.

4.2.7. Waste Management Plan

The WMP was designed to ensure the Shute Harbour Marina project does not adversely impact on the surrounding environment in terms of waste handling, storage and disposal.

This report outlines the waste management strategies recommended for the SHM. The report identifies opportunities for waste minimisation and addresses waste disposal options, waste storage, collection and transport.

4.2.8. Marine Megafauna Impact Assessment and Management Plan

The MMMP provides an assessment of the potential impacts of the SHM on marine megafauna species and outlines management requirements aimed at ensuring the proposed development has minimal impact on marine megafauna.

The MMMP provides an assessment of the potential impacts of the SHM on marine megafauna species and outlines management requirements aimed at ensuring the proposed development has minimal impact on marine megafauna.

4.3. Australian Government approvals

To proceed, the project requires approval by the Commonwealth Minister for the Environment, under Part 9 of the EPBC Act. The project was declared a 'controlled action' pursuant to section 75 of the EPBC Act on 27 July 2006 and the EIS process has been undertaken in accordance with the requirements of the bilateral agreement between the Queensland and Australian governments relating to environmental assessment.

Subsequent to this report, the controlled action will be considered by the Commonwealth Environment Minister for approval under section 133 of the EPBC Act once the Minister has received this evaluation report.

The minister will use the information in this report to make a decision under the EPBC Act as to whether the project should proceed, and if so apply conditions to the approval necessary to limit impacts on MNES.

5. Environmental impacts

This section outlines the major environmental effects⁸ identified in the EIS, additional project information, submissions on the EIS and comments from advisory agencies and other stakeholders. This report provides comments on the effects and, where necessary, includes conditions or recommendations to mitigate adverse impacts.

5.1. Land use and infrastructure

5.1.1. Context

The SHM site consists of land, intertidal areas and waters covering a total area of 25.2 ha across two leasehold titles. The proponent has a permit to occupy under the *Land Act 1994* for the purpose of 'investigation only' for the following area:

- Lot 2 on SP117389 (29.2 ha)

The current permit to occupy held by the proponent expires on 6 January 2014. The land representing this lot is currently owned by the State.

The site is located approximately 10 km south-east of Airlie Beach with land access limited to Shute Harbour Road. The site is bordered by the Conway National Park to the north, and on either side along Shute Harbour Road by a motel to the east, and a detached house and marine salvage operation to the west. Other land in the immediate vicinity of the site is reserved for open space and foreshore purposes.

The Shute Harbour Transit Terminal 1 km to the east of the site is one of the primary gateways for marine traffic, including barges to the Whitsunday Islands. The residential community of Shutehaven featuring two small clusters of detached dwellings on approximately 75 allotments is located a further kilometre to the north-east of the terminal. Shutehaven is situated on an elevated ridge, and is home to approximately 100 people.

The land use planning requirements for the project and a proposed development code are outlined in the planning report that was included as Appendix GS3 of the EIS. The code and planning processes relate to proposed development on land and reclaimed land and tidal land within the development site boundaries. This section focuses on the terrestrial and reclaimed land components of the project. Other site areas are considered in Section 5.3: Marina and coastal environment.

5.1.2. Proposed development

The proponent has outlined a sequence of development commencing with site works and establishment (including the marina breakwater, dredging and land reclamation) followed by the construction of the marina facilities and esplanade. Development concludes with the staged construction of the land based development (resort and hotel accommodation, marina plaza, retirement resort and Indigenous cultural centre).

⁸ For a definition of 'environmental effects', refer to the Glossary on page 200 of this report.

Construction of the marina is intended to overlap with the detailed design work for the built form components, enabling the proponent to seek the relevant development permits for material change of use, reconfiguration and operational works in a timely fashion. The proponent envisages a four year construction period with the land-based development accounting for the last two years.

The six precincts identified in the development master plan (refer Figure 2.2) include the marina and marina esplanade, managed resort accommodation, resort hotel, marina plaza and retirement resort, dredge material rehandling facility, and the Indigenous cultural centre. The precincts are linked by the esplanade boardwalk that also provides public access to the foreshore and vantage points for viewing Shute Bay and the Whitsunday Islands.

Other elements of the development master plan include:

- car parking positioned under buildings or at ground level
- built form comprising a single row of buildings along the northern edge of the site and the artificial headlands limited in height to a maximum of five storeys
- standalone Indigenous cultural centre at the point of the western artificial headland
- bus access and set down facilities at both ends of the development
- emergency services centre and cyclone shelter for guests and residents, the wider Shute Harbour and island communities, boat owners and visitors
- recreational, retail and commercial facilities for residents, boat owners and the wider community
- publicly accessible walkways and pathways at the water's edge, public amenities, seating and signage.

Development Master Plan

The development master plan reflects the proponent's vision for the project, detailed site and technical investigations and demographic and market research. The intent of the development precincts is outlined in the proposed SHM Development Code (Attachment GS3 of the SEIS) that is considered in Section 5.1.4 of this report.

The master plan is intended to provide an indication of the likely form of the development consistent with the proposed code. I note that development in the managed resort accommodation precinct will be undertaken in accordance with the code by third party purchasers, and that the pattern of the built form and development timelines may be affected by individual preferences and prevailing market conditions.

Built form

Proposed building heights have been limited to three storeys for the majority of the development, and are expected to be less than or commensurate with the height of the masts in the marina. A pocket of higher buildings, limited in height to 5 stories is proposed for the resort hotel and marina plaza precinct.

The highest building in the marina is proposed to have a total height of less than 23m AHD. The Shute Harbour Motel to the east of the site is a single storey structure with a ridgeline height of 17.1m AHD. The EIS stated that under the provisions of the current

Whitsunday Shire Planning Scheme the motel could be redeveloped to two storeys (code assessable) and to a similar height as the proposed SHM development.

The Marina Plaza precinct is intended to provide a hub for a range of retail and dining opportunities that cater for resort guests, visitors to the Shute Harbour Transit Terminal and local residents. The plaza would link to the esplanade boardwalk providing the public with access to the waterfront, and the Indigenous cultural centre and resort hotel at either point of the artificial headlands. The Indigenous cultural centre is expected to include a theatre, gallery, café, yarnning circle and viewing platform in a setting that provides an interface between the land and water.

5.1.3. Location specific requirements

Tenure and ownership

When developed, the proposed SHM project will consist of a mix of leasehold (marina) and freehold (land above MHWS) land uses. The proponent intends to apply for a term lease under the Land Act for the marina component, and to sell the right to occupy individual marina berths in accordance with the terms of the lease.

Following the construction of breakwater and reclamation of the land, the proponent will be required to obtain appropriate tenure for access over unallocated State land for the purposes of developing the project. The proponent intends to apply to convert the land above MHWS to freehold land under the Land Act, and for ownership to be transferred to Shute Harbour Marina Development Pty Ltd.

The proponent has indicated that freehold areas will be incorporated into a Community Titles Scheme in accordance with the requirements of the *Body Corporate and Community Management Act 1997*, and that the scheme is likely to include the following elements:

- establishment of a management structure to ensure that shared facilities are effectively managed
- a system of cost contribution from each component of the project to ensure fair and equitable allocation of levies
- creation of common property for thoroughfares and other shared assets
- creation of public thoroughfare easements to secure public access where necessary.

The proponent intends to preserve the right of public access to the Marina Esplanade and an unbroken linkage to Shute Harbour Road by applying for a public thoroughfare easement under the Land Act. The body corporate will be responsible for ongoing maintenance of all physical infrastructure in the SHM project area, in a safe and cost effective manner, and at no cost to WRC or the community.

Conway National Park

Conway National Park protects the State's largest area of tropical rainforest outside of tropical North Queensland. The 21 800 ha park separates Shute Harbour from Airlie Beach and features an extensive network of walking and mountain bike trails including

the Mount Rooper circuit and Conway Conservation Park to the north of Shute Harbour.

The EIS stated that the majority of the 4.14 ha portion of Lot 2 on SP117389 north of Shute Harbour Road supports intact native vegetation, but that portions are degraded as a result of historic land uses including a disused quarry and associated infrastructure, roadside batters and power-line easements. It is intended that this portion would remain undeveloped (apart from road widening) and incorporated into the National Park.

Visual amenity

Local residents highly value the scenic amenity afforded by this location, including uninterrupted views of the harbour and the ridgelines behind the coast. A visual amenity and landscape character assessment report was included as Appendix J of the EIS.

The SHM project has the potential to be visually prominent from a number of locations. The SHM site is visible from Shute Harbour Road, residential allotments along Coral Point ridge to the east, individual residential dwellings adjoining Shute Bay, public and private facilities within Shute Bay (including ferry terminal, boat ramps and jetties), the open waters of Shute Bay and Rooper Inlet, and the walking trails within Conway National Park. Temporary structures such as the cranes required to construct the marina resort precinct and dredging equipment to maintain the access channel may also impact on the local landscape at certain times.

In section 5.17.3 of this report, I note the proponent's commitments to ensuring that the project integrates with the local landscape and visual impacts are limited.

5.1.4. Relevant state and local government planning

The construction phase requires staging to allow for land creation, civil works and building works. Accordingly, project implementation will require a phased series of approvals.

Sections 5.2 and 5.3 in Attachment GS3 of the EIS provide a detailed overview of state and local government approvals required to develop the project, and the proposed approach to obtaining these approvals. Approval processes relating to the marina, dredging and other non-terrestrial components of the project are considered in Section **Error! Reference source not found.** of this report.

Mackay, Isaac and Whitsunday Regional Plan

The Mackay, Isaac and Whitsunday Regional Plan (MIWRP) is a statutory planning framework introduced in 2012 to guide growth and development in the region until 2031. As the pre-eminent plan for the region, the MIWRP takes precedence over all other planning instruments and provides context for local level planning.

The MIWRP includes a set of desired regional outcomes (DROs) that articulate the preferred direction for the region's development and land use outcomes. Local government planning schemes and subordinate policies must align with the intent of the DROs and their supporting principles and policies.

The MIWRP designates the SHM site as being in the Regional Landscape and Rural Production Area, and outside of the Urban Footprint expected to accommodate the region's projected urban development needs until 2031. The MIWRP does state, however, that local government may designate land for urban uses outside of this area where it can be demonstrated to be a relevant and appropriate use of land against the DROs of the plan. The repeal on 11 July 2012 of the State Planning Regulatory Provisions that accompanied the MIWRP provides further decision-making autonomy to local government to determine if a development proposal represents an appropriate outcome for their area.

Section 6.2 in Attachment GS3 of the EIS includes a detailed assessment of the SHM project against the DROs in the MIWRP to demonstrate the merits of the project for Shute Harbour and the wider region.

State planning policies

On 2 December 2013, the Queensland Government released a new State Planning Policy (SPP) that simplifies and clarifies the State's interests, replacing 14 previous SPP's with a single SPP. The new SPP sets out policies about matters of State interest in the planning and development assessment system and forms part of the government's broader commitment to planning reform. Attachment GS3 of the EIS includes an assessment of the SHM project against the existing SPPs.

Whitsunday Shire Planning Scheme

The Whitsunday Shire Planning Scheme (WSPS) was adopted in January 2009 and replaced the Whitsunday Planning Scheme 2000. The EIS was prepared in accordance with this superseded planning scheme, along with draft versions of the WSPS.

At the strategic level, the WSPS prioritises the continued development and operations of the Shute Harbour Passenger and Freight Terminal to service the marine industry demands of the region. Shute Harbour is identified as a desirable location for marine industry and supporting commercial uses, including mainland tourist facilities, while limited residential and convenience scale commercial development are considered appropriate for Shutehaven.

The WSPS also includes a number of local strategies for Shute Harbour and Shutehaven. These strategies seek to protect the terminal from the encroachment of incompatible land uses, encourage uses that support the marine industry including tourist related commercial activities, and promote the development of an integrated mixed-use centre for tourists and residents.

The SHM site is currently zoned as follows:

- Lot 2 SP117389: Open space Zone—where above MHWS and north of Shute Harbour Road
- the remainder of Lot 2 is below MHWS outside the boundary of the Planning Scheme and is undesignated.

Section 6.6 in Attachment GS3 of the EIS includes a detailed assessment of the SHM project against the following provisions of the WSPS:

- the strategic plan encompassing shire wide strategies and the Shutehaven Local Strategy.
- desired environmental outcomes.
- overall outcomes for the open space, commercial and tourism zone codes.
- overlay codes.

WRC has confirmed that the project in its current form would invoke both code and impact assessment against a number of zone and overlay codes in the WSPS.

Proposed SHM development code

A proposed SHM development code is included as Appendix B in Attachment GS3 of the EIS. The code relates to development on land, reclaimed land above MHWS, and the tidal land and waters below MHWS.

The code is intended to function as part of a preliminary approval under Section 242 of the SPA which affects the WSPS by specifying:

- a framework of development precincts and precinct intents which facilitate the attainment of the SHM development code objectives
- the type of development that is envisaged within the preliminary approval area and the corresponding levels of assessment.

The preliminary approval would, through the proposed code, establish specific assessment provisions that will apply in assessing any subsequent development application within the SHM.

In keeping with the strategic intent of the WSPS the development code should seek to facilitate tourism based development in Shute Harbour capable of generating local and regional economic and employment benefits. WRC has requested a number of amendments to ensure that the code aligns with other codes and provisions in the WSPS. Included in these amendments is the requirement that any activity not listed in the code will be expected to comply with all relevant matters in the entire planning scheme, and will not compromise the scheme's desired environmental outcomes. I expect the proponent to adopt all of the requested amendments prior to submitting an application for a preliminary approval to give effect to the code.

5.1.5. Coordinator-General's conclusions

In reviewing the information provided in the EIS, along with the submissions received during the public notification periods, I have concluded that the project would complement and integrate with the existing marine infrastructure and land uses in the Shute Harbour area. The project aligns with the strategic intent of the WRC planning scheme that identifies Shute Harbour as a desirable location for marine and tourism based development.

I note that the proponent has provided a cost benefit analysis for the project as Attachment GS6 of the EIS. While the timing and built form of the project may be affected by prevailing market conditions, my recommendation to WRC is that any subsequent development approvals must be consistent with the proponent's development master plan as assessed in this report.

I note the proponent's intention to provide publicly accessible walkways and pathways at the water's edge, public amenities, seating and signage as part of the development.

I have stated conditions for development generally in Appendix 1.

5.1.6. Infrastructure and services

The EIS discussed the need for substantial infrastructure to support the proposed project during the pre-construction, construction and operation stages of the project.

The project site has limited access to serviced infrastructure including roads, walkways, access to water supply, telecommunications, energy, sewage reticulation systems.

WRC advised in its submission and subsequent discussions with the Office of the Coordinator-General (July 2013) that council would not contribute towards infrastructure costs for this proposal. WRC advised that it could recoup operational costs for the water and sewage works through the local government rating system.

Advisory agencies advised in their submissions on the EIS that the proponent would need to provide infrastructure to support the pre-construction, construction and operation stages of the development. Road and maritime infrastructure and services are discussed in Section 6: Traffic and transport.

5.1.7. Existing infrastructure and services

Water and sewerage

The EIS stated that as an undeveloped site there is no water supply or dedicated sewerage infrastructure within the site. A potable water source for the site is available by way of an existing 250 mm diameter water main on Shute Harbour Road. An existing 150 mm sewerage rising main along Shute Harbour Road runs past the site to service areas to the east of the project site, including the motel, ferry terminal and residents of Shutehaven.

Electricity

Ergon Energy is responsible for the reticulation of electricity to the project site. An 11KV network is present, adjacent to Shute Harbour Road and that network would need to be upgraded to supply electricity to and within the site. Ergon's existing 66KV network is located a number of kilometres from the site. Ergon advised the proponent in 2008 that the existing Mount Rooper zone substation was near capacity and that either a new upgrade to the station or a new zone substation (66/11KV) would be required to service the project.

Telecommunications

Currently, a number of service providers can deliver information and communication technology services to the region, including telephone, mobile telephone reception, information systems and computer communication facilities. These providers have access to Telstra infrastructure with the network providing broadband data transmission enabled via ADSL technology

Appendix L: Electricity and Telecommunications Report of the EIS stated that Telstra's adjacent existing assets include a fibre optic cable in conduit along the north side of Shute Harbour Road and a copper cable in conduit along the south side of Shute Harbour Road connecting with a pillar at the boundary with the property east of the project area. Other assets include Telstra and Optus mobile phone repeater stations and wireless data coverage from existing base stations. Pay TV services are available from Austar satellite digital systems.

5.1.8. Proposed infrastructure

Water and sewerage

Appendix M of the EIS provided a water supply and sewerage investigation which identified the anticipated water demand of 800 L/EP/day and sewerage load of 180 L/EP/day based upon DNRM and WRC guidelines. The proponent has committed to provide all water supply and sewerage infrastructure necessary to service the project area, including fire-fighting infrastructure, back-up energy for the infrastructure and backup water supply required for emergency response.

The EIS reported that connection to existing water and sewer mains could accommodate the increased loads required by this development. In its submission on the EIS, WRC stated that a water and sewer network analysis should be undertaken to ensure that capacity is available to supply existing suburbs in addition to the proposed resort. I recommend that the requirement to undertake this analysis form part of an infrastructure agreement between the proponent and WRC.

Indications from WRC are that the current network could not cope with additional load coming from this project, and the proponent would be responsible for all costs involved in upgrading approximately 25 km of pipe, to upgrade the system appropriately. This is further noted, along with other infrastructure requirements in Section 5.1 (Land use and infrastructure).

Within the site area, the construction of water and sewage mains and reticulation infrastructure on the reclaimed area will take place during months 25–30.

Stormwater drainage

The stormwater drainage design outlined in the EIS details an upgrade of the Shute Harbour Road to provide a minimum average recurrence interval (ARI) 50-year immunity against flooding. It proposed to divert runoff from the Conway National Park around the site and capture and treat urban runoff from within the proposed development with no discharge into the marina. The proponent included a Stormwater Management Strategy (EIS Appendix N) which provided the implementation criteria for these elements.

The proponent advised that they are prepared to consider alternative discharge locations away from the mangrove re-establishment area, if required at the detailed design stage. This addresses the risks to aquatic biota within mangrove areas by directing stormwater away from mangrove areas and allowing greater flushing to occur.

The proponent also advised that more detailed plans demonstrating how road runoff will past through bio-retention basins, then into Shute Bay will be addressed at the detailed design stage.

Within the site area, the construction of stormwater mains and reticulation infrastructure on the reclaimed area will take place during months 25–30.

Electricity

Appendix L of the EIS found that the demand load for the early stages of the development could be provided from the 11 KV network adjacent to the Shute Harbour Road, and that the network would need to be upgraded to supply electricity to the later stages of the development. Underground cables would be installed within the site to provide electricity.

Within the site area, the construction of electricity infrastructure on the reclaimed area will take place during months 25–30.

The marina will require 11KV/240V padmount transformer substations (PTS). Ergon advised the proponent that it does not undertake PTS for installations other than those on land. The proponent advised that it would provide the PTS required to service the marina development and committed to ensure spare PTS's would be available to ensure a backup and continuity of electricity supply to the marina.

Telecommunications

Appendix L: Electricity and Telecommunications Report of the EIS, reported that Telstra was mandated to provide a copper cable telephone network, in all new freehold developments. This is to be provided free of charge to the developer except for the cost of trenching and any possible civil headworks. Underground cables would be installed within the site to provide telecommunications.

Additional information provided by the proponent supported the findings of Appendix L of the EIS, which found that telecommunications infrastructure was adequate and could be augmented to service the development.

Within the site area, the construction of electricity infrastructure on the reclaimed area will take place during months 25–30.

Waste management

Appendix U2 of the EIS estimated that domestic and general waste (including organic and food waste) would generate 1.05 tonnes per person, per annum and comprise the largest waste stream generated during operation of the project. It estimated that the remaining waste streams including paper and cardboard, glass, plastics and metals would generate 0.75 tonnes of domestic recyclable waste per person, per annum.

The EIS reported that plastic waste will be kept to a minimum with retail outlets to be encouraged to supply biodegradable or cotton bags as alternatives to plastic bags.

The proponent's SBMP describes a number of strategies to ensure no unintentional or unmanaged release of waste into the environment. This includes releases from vessel pump out. The marina plan submitted by the proponent shows the vessel sewerage

pump out station. No boat maintenance facilities are provided in the marina. In section 6.3.1 of the SEIS, the proponent noted that boat maintenance is not provided in part due to submissions received, and in part due to the adequacy of marine maintenance facilities in the region. There are currently existing maintenance facilities in Shute Harbour.

The proponent stated that contracts for marina berths and mooring will contain conditions relating to a nil bilge water release policy from vessels. The SBMP also includes strategies for dealing with other on-site waste including litter.

Shute Harbour Road intersection

The proponent has committed to construct a new intersection connecting Shute Harbour Road to the project site. The upgrade incorporates a realignment, new surface design, two-metre shoulders and median strip with kerbing, dedicated area for future possible road widening to three lanes, new culverts for drainage and grassed swale stormwater drains.

The proponent will be required to enter into an infrastructure agreement with DTMR concerning the standards to which the new intersection must be constructed. I note the proponent is also required to abide by its 1999 Deed of Agreement with DTMR when undertaking works to upgrade Shute Harbour Road.

In its submission on the SEIS, DTMR noted that an updated road safety risk assessment is required to assess impacts and identify appropriate impact mitigation measures for the project.

5.1.9. Coordinator-General's conclusions

I have conditioned the proponent to enter into an infrastructure agreement with WRC to ensure that infrastructure and services proposed for the construction and operation of the project are appropriate to service the estimated visitor population, permanent population, and construction and operation workforces. The guiding principle is that the proponent must fund and provide the infrastructure required to support the margin of extra demand generated by the development.

I also note the proponent has committed to reduce waste volumes, to ensure nil release from the project site and to effectively manage dangerous materials within the construction site.

I require the following as part of the proposed development:

- connection to a reticulated water supply system and reticulated sewerage system in accordance with applicable standards
- adequate provision of water services for fire fighting purposes
- construction of stormwater drainage works in accordance with applicable standards
- stormwater quantities do not increase flows to the marina area or adjacent areas
- provision of electricity and telecommunications in accordance with applicable standards
- nil discharge of liquid or solid wastes to the Great Barrier Reef Coast Marine Park during construction and operation

- provision of refuse collection facilities appropriate to serve the development
- at all times and for each stage of the project, the proponent must maintain the safety, condition and efficiency of state-controlled and local roads
- completion of required road works prior to the commencement of project construction
- the upgrade of Shute Harbour Road occurs under the terms of the 1999 Deed of Agreement with DTMR.

I have stated conditions in this report to ensure the provision of infrastructure and management of associated impacts (Appendix 1).

5.2. Terrestrial environment

This section of the report provides an assessment of terrestrial state significant biodiversity values⁹ (SSBV) that may be impacted by the project. For further discussion on MNES affected by the project, refer to Section 7 on page 84 of this report.

5.2.1. Context

The project is located at Shute Bay, adjacent to the Conway National Park and existing coastal developments at Shute Haven and Coral Point. The project area encompasses terrestrial vegetation on the lower ridges of Mount Rooper and extends seaward. The project area is intersected by Shute Harbour Road, with the entire development to be located south of the road. The project area is 29.3 ha in total, with only 25.2 ha to be developed. The remaining approximately 4 ha of undeveloped land lies between Shute Harbour Road and Conway National Park.

The terrestrial vegetation in the project area north of Shute Harbour Road forms part of a large contiguous patch of remnant eucalypt forest connected to the Conway National Park. Vegetation to the south of Shute Harbour Road is comprised of intertidal and marine habitats, which are discussed further in Section 5.3 Marine and Coastal Environment on page 40.

Submissions received on the EIS material raised a number of issues in relation to biodiversity, including:

- impacts on conservation values of Conway National Park
- adequacy of flora and fauna surveys
- impacts associated with vegetation clearing, including alteration to habitat structure, connectivity and composition/suite of species
- weed and pest animal management
- offsets for significant residual impacts on vegetation communities, and listed flora and fauna species.

⁹ State Significant Biodiversity Values means the values identified in State Significant Biodiversity Values of the Queensland Biodiversity Offset Policy (Version 1 dated 3 October 2011).

5.2.2. Terrestrial flora

Desktop studies and field surveys recorded a detailed floral inventory of the site, which recorded 172 species of native Australian flora and 24 exotic species of flora.

None of the terrestrial flora species identified is listed under either State or Commonwealth conservation legislation. Neither are any of the species found to be at, or outside of the limits of their known geographic range.

Most (approximately 90 per cent) of the vegetation on the site, with the exception of terrestrial vegetation along Shute Harbour Road and the former quarry site (approximately 10 per cent) is relatively undisturbed and has good ecological value and function (refer Figure 5.1). The regional ecosystems (REs) were identified in the project area are listed in Table 5.1.

Table 5.1 Regional ecosystems within project area

Regional ecosystem classification	Description	Vegetation Management Act status	Total area (ha)
8.12.14a	Grey ironbark <i>Eucalyptus drepanophylla</i> low woodland to open forest	Not of concern	1.5
8.12.5c	Queensland Blue Gum <i>Eucalyptus tereticornis</i> open forest	Not of concern	2.37
8.12.14a	Shute Harbour white mahogany <i>Eucalyptus portuensis</i> low woodland to open forest	Not of concern	0.55
8.1.1	Mangrove shrubland to low closed forest	Not of concern	1.67

The EIS found that the site is mapped as containing essential habitat for *Macropteranthes fitzalanii*, a shrub or small tree which grows to seven metres in height. Habitat for the species includes a variety of dry vine forest and moist rainforest types occurring on alluvium and steep hillslopes. REs 8.3.10, 8.12.3, 8.12.11 and 8.12.18 are key habitats for the species. However, none of these REs occur on the project site.

Only one species (yellow oleander, *Cassipouira thevetia*) is recognised as a declared weed. It is listed as Class 3 under the *Land Protection (Pest and Stock Route Management) Act 2002*. All other weeds on the site are considered to be environmental weeds.

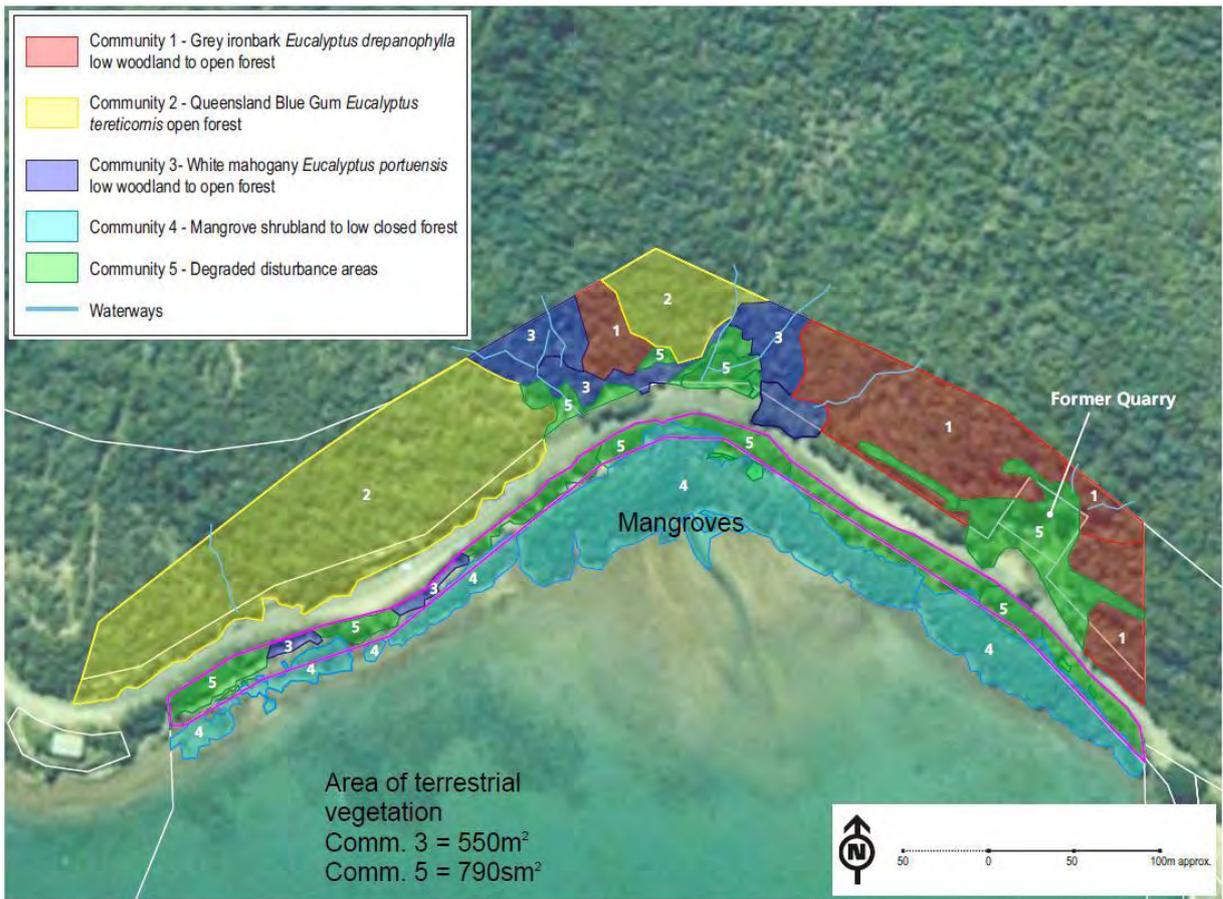


Figure 5.1 Terrestrial vegetation within the project area

Vegetation clearing

The proponent has identified that a total of 0.94 ha of terrestrial vegetation to the south of Shute Harbour Road (between the road and the intertidal zone) will be cleared for construction.

Construction of the access roadway leading to the development requires clearance of up to 0.15 ha and a further approximately 0.79 ha of non-remnant vegetation will also be cleared for construction of the project. Refer to Table 5.2 for the areas of regional ecosystems to be cleared.

Table 5.2 Total area of regional ecosystems to be cleared

Regional ecosystem classification	Description	Total area to be cleared (ha)
8.12.14a	Grey ironbark <i>Eucalyptus drepanophylla</i> low woodland to open forest	0.1
8.12.5c	Queensland Blue Gum <i>Eucalyptus tereticornis</i> open forest	0.05
8.12.14a	Shute Harbour white mahogany <i>Eucalyptus portuensis</i> low woodland to open forest	0
8.1.1	Mangrove shrubland to low closed forest	1.65
Total		1.8

Agency advice

DNRM advised in its submission to the SEIS that up to 2.34 ha of mapped remnant vegetation and mapped essential habitat falls within the development area, when the Amended Development Masterplan 2106 SISI P6 is overlaid with the version 6.1 Regional Ecosystem Mapping. The proponent is required to clarify the area of mapped remnant vegetation and essential habitat proposed to be cleared for the project when submitting a development application.

Coordinator-General's conclusions—terrestrial flora

A total area of 0.94 ha of vegetation with the VM Act status of 'not of concern' will be cleared for the project although this is to be reviewed at detailed design stage. No threatened flora species are present within the development.

I accept that the proposed clearing of native vegetation would be a necessary part of the project and will have a negligible impact overall on the representation of individual vegetation associations in the area. Detailed development plans will need to demonstrate that the extent of clearing is minimised.

I expect the proponent to ensure that the project will not result in indirect impacts to terrestrial vegetation that will not be cleared.

I have stated conditions in this report to ensure the appropriate management of impacts to terrestrial flora (Appendix 1).

5.2.3. Terrestrial fauna

The fauna survey identified a total of 41 terrestrial fauna species as being potentially present at the site, comprising of the following:

- 7 species (3 families) of reptiles
- 25 species (14 families) of birds
- 9 species (8 families) of mammals.

The EIS identified two terrestrial species listed under *the Nature Conservation Act 1992* (NC Act) that have the potential to occur in the project area, including the following:

- Proserpine rock-wallaby (*Petrogale persephone*), endangered
- water mouse (*Xeromys myoides*), vulnerable.

Other terrestrial species that are listed under the Commonwealth EPBC Act and have the potential to occur in the project area are discussed further in Section 7 of this report.

The EIS also identified that essential habitat for the Proserpine rock-wallaby (endangered, NC Act) and the rufous owl (*Ninox rufa queenslandia*) occurs within the project area. DEHP has advised that the habitat mapped as 'essential' for the Proserpine rock-wallaby is in fact not suitable habitat for the species.

Proserpine rock-wallaby

The Proserpine rock-wallaby is the only species to have a high probability of using the project area. It is listed as endangered under both the NC Act and EPBC Act. The EIS found that potential habitat for this species occurs within the northern sectors of the project area.

Essential habitat for the species comprises vine forest but is also noted as including RE 8.12.15 and RE 8.12.14 where suitable rocky outcropping occurs. Although both REs occur in the project area, no rock outcrops are present. Additionally, the project area does not provide wildlife corridor values for the species.

The species was not recorded within the impact area during field surveys undertaken in 2008, but has been recorded in the area previously by DEHP and logged on the WildNet database. The project area is in close proximity to the Conway National Park, where Proserpine rock-wallabies occur.

Potential impacts from the project on the Proserpine rock-wallaby include injury and death from collision incidents along Shute Harbour Road, and habitat loss from vegetation clearing for construction of the project.

Vehicle strike

Vehicle strike is identified as a moderate threat to the long-term survival of the Proserpine rock-wallaby in the species' national recovery plan.

Statistical data released by (formerly) DERM in 2010 indicated that mortality of the Proserpine rock-wallaby usually peaks during the dry season from September to November, as a decrease in suitable foraging resources available in their preferred habitat results in animals feeding along roadside verges. The majority of road deaths occur where road speeds are 80 km/hr or greater and/or where there are feeding areas in close proximity to roads.

Proserpine rock-wallaby road deaths have been recorded on Shute Harbour Road at Flametree Hill approximately 4 km to the west of the project site. Actions have already been undertaken to reduce road collisions in this area, including revegetation of road verges and the trial of roadside wildlife reflectors¹⁰. WRC has also been managing

¹⁰ Barry Nolan, Senior Ranger Airlie Beach Central Region—Queensland Parks and Wildlife Service (QPWS), pers. comm., 9th May 2007 reported in Place 2008

guinea grass growth along road verges to minimise road strike impacts on the wallabies.

The proponent has committed to collaborate with QPWS and DTMR to contribute to the above listed measures to mitigate road strike impacts on the Proserpine rock-wallaby. QPWS advise that any additional investment on the maintenance of road verges will reduce the potential for injuries from collisions.

Habitat loss

Up to 0.94 ha of potential Proserpine rock-wallaby habitat located within the Shute Harbour Road Reserve would be cleared. Removal of this vegetation will not affect viable habitat corridors for this species and hence will not lead to a long-term decrease in the size of a population.

Conclusion

Cumulatively, the project will result in a net increase in road traffic along Shute Harbour Road with the operational phase of the project expected to generate 1930 vehicle movements per day (Refer Table 6.1). The implementation of proposed mitigation measures will not reduce the impacts on the Proserpine rock-wallaby. Collisions with the Proserpine Rock-wallaby will be monitored by the QPWS.

The DNPRSR has suggested that the proponent should offset significant residual impacts to Proserpine rock-wallaby from vehicle strikes through providing support to the species' recovery plan. I have stated a condition that the proponent must prepare a proposed offset plan to address significant residual impacts to environmental values identified in the EIS including road-strike injury and mortality of the Proserpine rock-wallaby.

Water mouse

The water mouse is listed as vulnerable under both the NC Act and EPBC Act. It was identified as potentially occurring in the project area through desktop studies. However, no individuals or evidence of presence was identified in field surveys.

The species occurs in tidal mangrove and saltmarsh habitat. Habitat assessments indicate that suitable high-tide nesting habitat for the water mouse does not occur at the site. However, tidal mangrove habitat may provide suitable low-tide foraging habitat for the species. The project area does not provide wildlife corridor values for the water mouse, as there is very little suitable habitat for this species adjacent to the site.

It is unlikely that the water mouse inhabits tidal mangrove habitat in the project area. Therefore, the project is unlikely to impact on the species.

Rufous owl

The rufous owl is not listed under either State or Commonwealth conservation legislation. The species inhabits lowland and highland tropical and subtropical rainforest, mangrove edges and riparian paperbark forest bordered by savannah/open sclerophyll woodland. Essential habitat for the species occurs in the RE 1.1, RE 8.12.5 and RE 8.12.14. Roosting habitat for the species may occur in the rainforest

understorey that occurs along the western drainage line, before emerging at night to forage in adjacent open forests and rainforests.

Migratory terrestrial species

The following migratory fauna species listed under the EPBC Act have the potential to be impacted upon by the project:

- white-bellied Sea-eagle (*Haliaeetus leucogaster*)
- great egret (*Ardea alba*)
- white-throated Needletail (*Hirundapus caudacutus*)
- rainbow bee-eater (*Merops ornatus*)
- black-faced monarch (*Monarcha melanopsis*)
- spectacled monarch (*Monarcha trivirgatus*).

Impacts to these species are discussed further in Section 7 of this report.

Mitigation measures

The proponent has committed to implement the following mitigation measures to reduce impacts to threatened terrestrial fauna:

- undertaking environmental assessment for all facets of the project so that the project can be amended to reduce its impact through the design
- developing management plans and outcome measures to mitigate recognisable impacts and risks
- developing a monitoring and auditing program for the life of the project to determine if performance objectives are been met and to detect any unforeseen impacts that require corrective action.

Of key importance will be the successful implementation of the various environmental management plans (EMP) that have been prepared for the construction and operational phases of the SHM project.

Agency advice

DNPRSR highlighted concerns about the potential impacts on Conway National Park from increased visitor use in the area including impacts on fauna and flora. The Department requested that the proponent detail how these impacts would be avoided or minimised. Furthermore, the Department requested that the proponent should identify impacts from increased use of the national park and projected visitor use demands on the facilities on Conway National Park and further commercial visitor tourism to the area, including mitigation measures.

Coordinator-General's conclusions—terrestrial fauna

The above mitigation measures do not fully compensate for the direct loss of approximately 0.94 ha of terrestrial vegetation and 1.8 ha of mangrove vegetation that is considered likely to provide potential habitat for terrestrial species.

The Marine Habitat Offset Plan (MHOP) proposed by the proponent provides for the development of an offset plan that adequately compensates for the loss of 1.8 ha of mangrove vegetation.

It should be noted however, that although all of the above listed species have the potential to utilise habitat within the project site, it is unlikely that the areas of terrestrial and mangrove vegetation that will be removed provide important habitat given the degraded nature of the habitat present within the site.

5.3. Marine and coastal environment

5.3.1. Existing environment

Shute Bay is a large, shallow bay in the Mackay-Whitsunday region, adjacent to the Whitsunday Islands. The bay is separated from Molle Channel by three barrier islands. The barrier islands shield the bay from strong wave activity during cyclones and other extreme weather events, creating a 'safe harbour' in Shute Bay.

Coastal development at the northern end of the bay at Shutehaven comprises a barge and a ferry terminal and other tourism developments (refer Figure 5.1).

Mangroves line the southern and western coastlines of Shute Bay. Stormwater draining lines intersect the coastline and mangrove habitat, draining the surrounding landscape into Shute Bay.



Figure 5.2 Aerial view of Shute Bay

Hydrodynamics

Shute Bay is characterised by strong tidal flushing due to a large tidal range of approximately 4 m. Water in the bay is well mixed due to the efficient removal of water from the bay by high currents in the adjacent deep channel and the large proportion of water exchanged in the tides.

Tidal and wind-driven currents transport fine suspended sediments offshore through the Shute Harbour channel. Current velocities within Shute Bay are generally not large enough to mobilise significant quantities of sediment, however turbidity in the bay is common during high rainfall and strong wind conditions, such as during storms.

Shute Bay is also affected by south-east trade winds from April to October, which influences wave dynamics.

Sediment

Marine sediment in Shute Bay is predominantly fine grained with slightly coarser grained material covering a thickness of less than one metre over the seabed in the western half of the project site. Fine and coarse grained sediment is generally found below the low water mark, increasing in depth to more than 10 m towards the centre of the bay. Coarser materials are present near the high water mark with cobbles and gravel forming a beach-like shore that supports mangroves.

A small portion of the near surface sediments was found to be contaminated by tributyltin (TBT). Sediment analysis conducted for the EIS suggests that the TBT in the samples was most likely present in paint flecks that may not be bound to sediment or randomly distributed. There was no evidence of contaminants at depth and therefore it is expected any contamination is concentrated in the top 0.5 m of sediment.

Water quality

Water quality objectives have been defined under the Environmental Protection (Water) Policy 2008 for the project area. When the water quality objectives are met, the environmental values for the area will be protected. Water quality studies conducted for the EIS indicated that water quality in Shute Bay met the water quality objectives for all parameters with the exception of total suspended solids (TSS).

Low levels of heavy metals, oil and grease and total petroleum hydrocarbons were generally recorded in most samples. The only exception to this was recorded in September 2007 at the saltwater sampling location SW8 (refer Figure 5.3) where oil and grease levels were recorded at 20 mg/L (15 mg/L over the objective). The EIS attributed this to the increased number of boats operating in Shute Bay over the September school holidays.

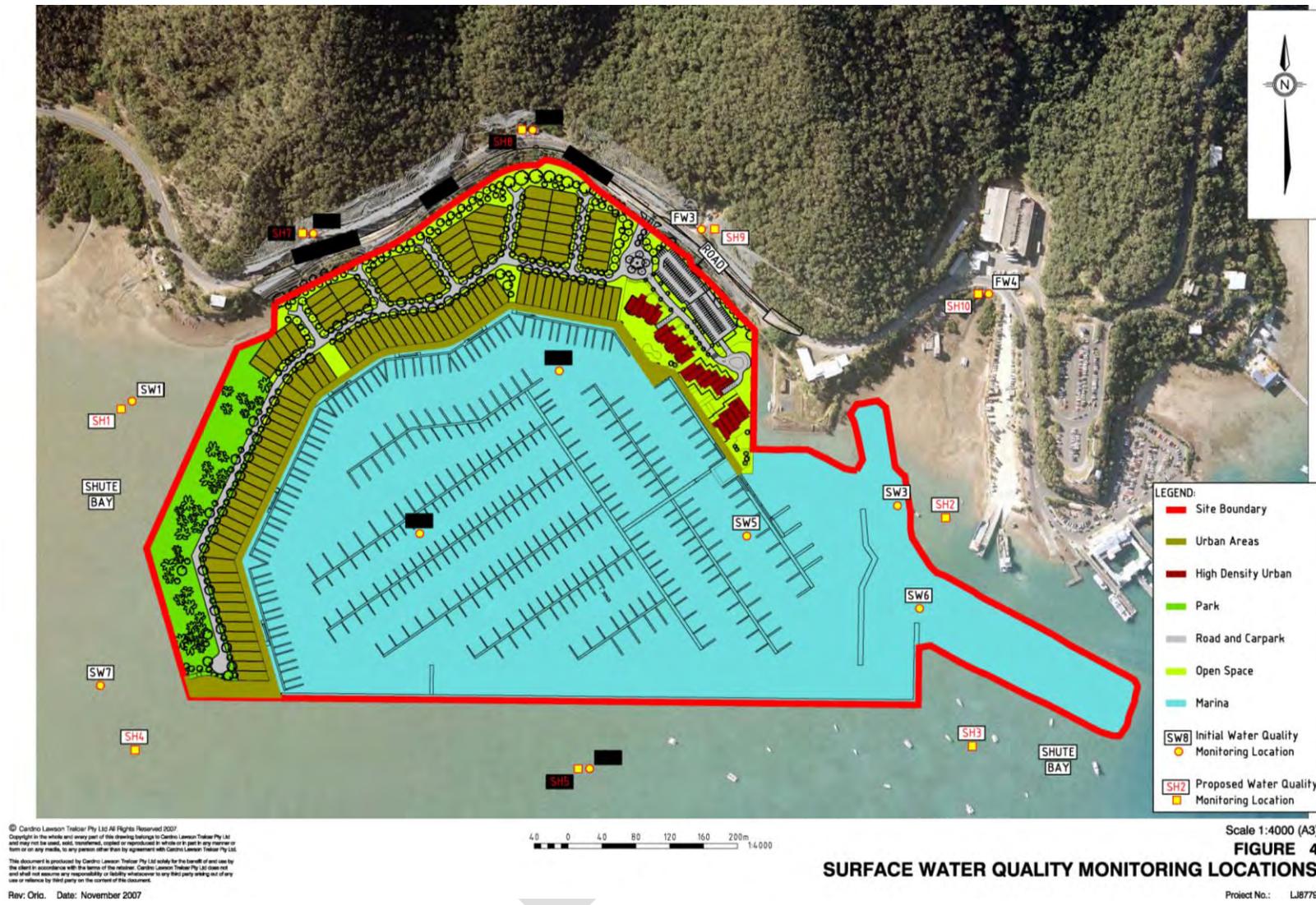


Figure 5.3 Surface water quality monitoring locations undertaken for the EIS in 2007

Note: Marina design depicted in overlay since amended.

Environmental impacts
 Shute Harbour Marina project:
 Coordinator-General's evaluation report on the environmental impact statement

Stormwater entering Shute Bay drains natural vegetation surrounding areas including Conway National Park. The EIS stated that the water quality of stormwater runoff does not contain high concentrations of anthropogenic pollutants. However, should development along Shute Harbour Road proceed, it is likely to increase concentrations of anthropogenic pollutants that would be suspended in stormwater draining those areas.

Marine habitats

Marine and coastal habitats in Shute Bay were surveyed in 2007 for the EIS. Surveys confirmed the presence of seagrass beds, macroalgae beds, coral communities, mangrove communities and fish habitat. The findings of these surveys are discussed below

The proponent is required to verify the amount and composition of marine habitats, particularly seagrass, expected to be cleared for the project prior to construction commencing.

Seagrass

Seagrass covered approximately 147 ha of Shute Bay. The composition of seagrass communities was spatially highly variable and consisted of a mixture of *Halophila ovalis*, *Halodule uninervis* and *Zostera muelleri*.

Seagrass was sparsely distributed within and adjacent to the marina footprint (refer Figure 5.4). Patchy, sparse cover of *H. ovalis* and *H. uninervis* was found encroaching on the marina's proposed southern breakwater area and a moderately dense bed of *H. uninervis* was identified in the area of the proposed western artificial headland. The biomass of seagrass within and adjacent to the marina footprint was reported to be relatively low for the represented species, and low for tropical seagrass generally.

Two major cyclone events have occurred over the Whitsunday region since the seagrass survey was conducted. The impacts of these cyclone events on seagrass in Shute Bay are not known but it can be assumed that the area, density and composition of seagrass coverage in the bay would be different from that surveyed for the EIS.

Verbal advice from James Cook University¹¹ indicated that a large proportion of Shute Bay is a potential seagrass area and composites of studies completed since the 1990s verify this.

¹¹ Michael Rasheed, James Cook University, pers. comm., 21st November 2013

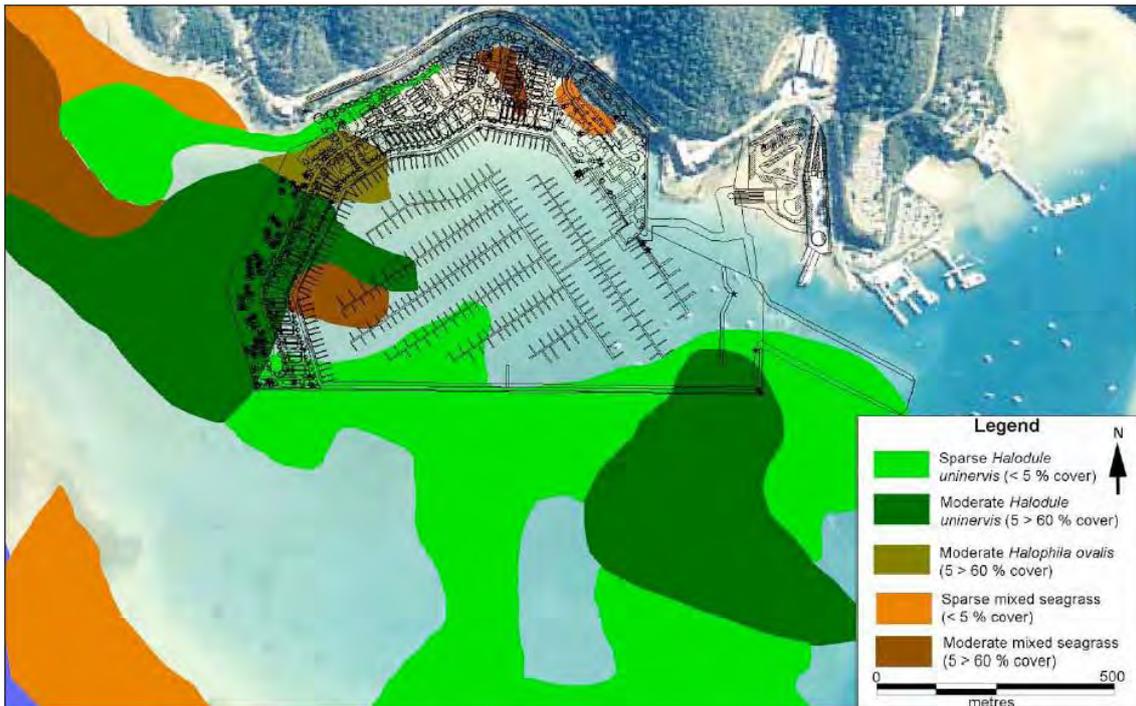


Figure 5.4 Seagrass communities in the development footprint in 2007

Note: Marina design depicted in overlay since amended.

Macroalgae

A total of approximately 133 ha of mixed macroalgae communities was recorded in Shute Bay during surveys. Mixed macroalgae communities were found throughout a lot of the subtidal areas of Shute Bay typically overlapping seagrass beds. Brown, red and green algae dominated the mixed macroalgae communities in the bay.

Coral

Coral communities in Shute Bay and around neighbouring islands consist of hard and soft genera. Coral in the region was found to be small with diameters generally no greater than 30 cm and patchily distributed along the intertidal zone (refer Figure 5.5). Abundance of hard coral is typical of inshore coral communities in the Whitsunday region. The distribution of corals within Shute Bay is determined by turbidity levels. Corals typically prefer clearer waters free from turbidity to allow maximum light absorption.

Approximately 0.44 ha of coral was recorded in the intertidal zone within the marina footprint. Coral communities appeared healthy with no sign of bleaching or stress. Bleaching events occurred in the region in 1998 and 2002, which was associated with warmer water temperatures.

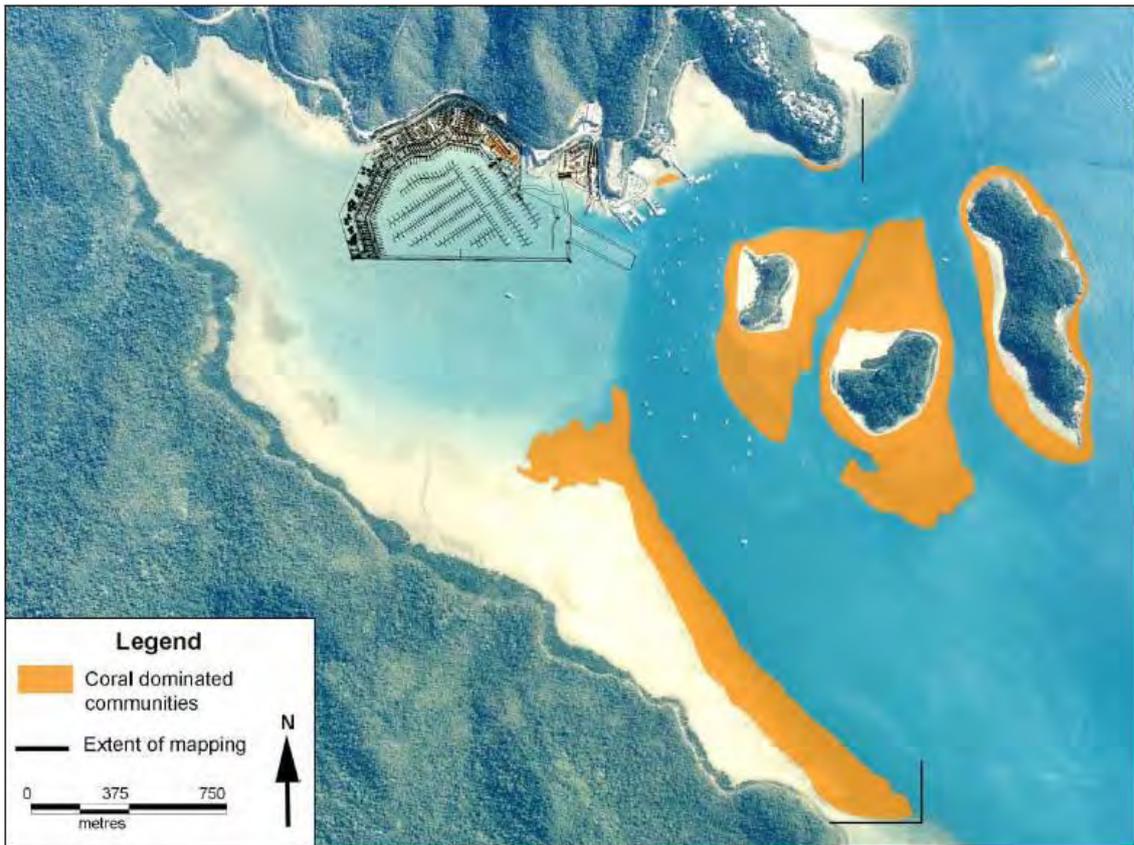


Figure 5.5 Coral communities of Shute Bay

Note: Marina design depicted in overlay since amended

Mangroves

Approximately 35 ha of mangroves was recorded in Shute Bay. Red mangroves (*Rhizophora stylosa*) were found to dominate mangrove communities. Grey mangrove (*Avicennia marina*), river mangrove (*Aegiceras corniculatum*), myrtle mangrove (*Osbornia octodonata*), blind-your-eye mangrove (*Excoecaria agallocha*), mangrove apple (*Sonneratia alba*) and yellow mangrove (*Ceriops tagal*) were also found in the bay.

Mangrove communities on the western and southern sides of Shute Bay covered a significantly greater area than those within or to the east of the project area (refer Figure 5.6).

Approximately 1.84 ha of mangroves was found to occur within the project footprint. Mangroves within and adjacent to the project area appeared healthy, however they are expected to be of relatively low value to fisheries.

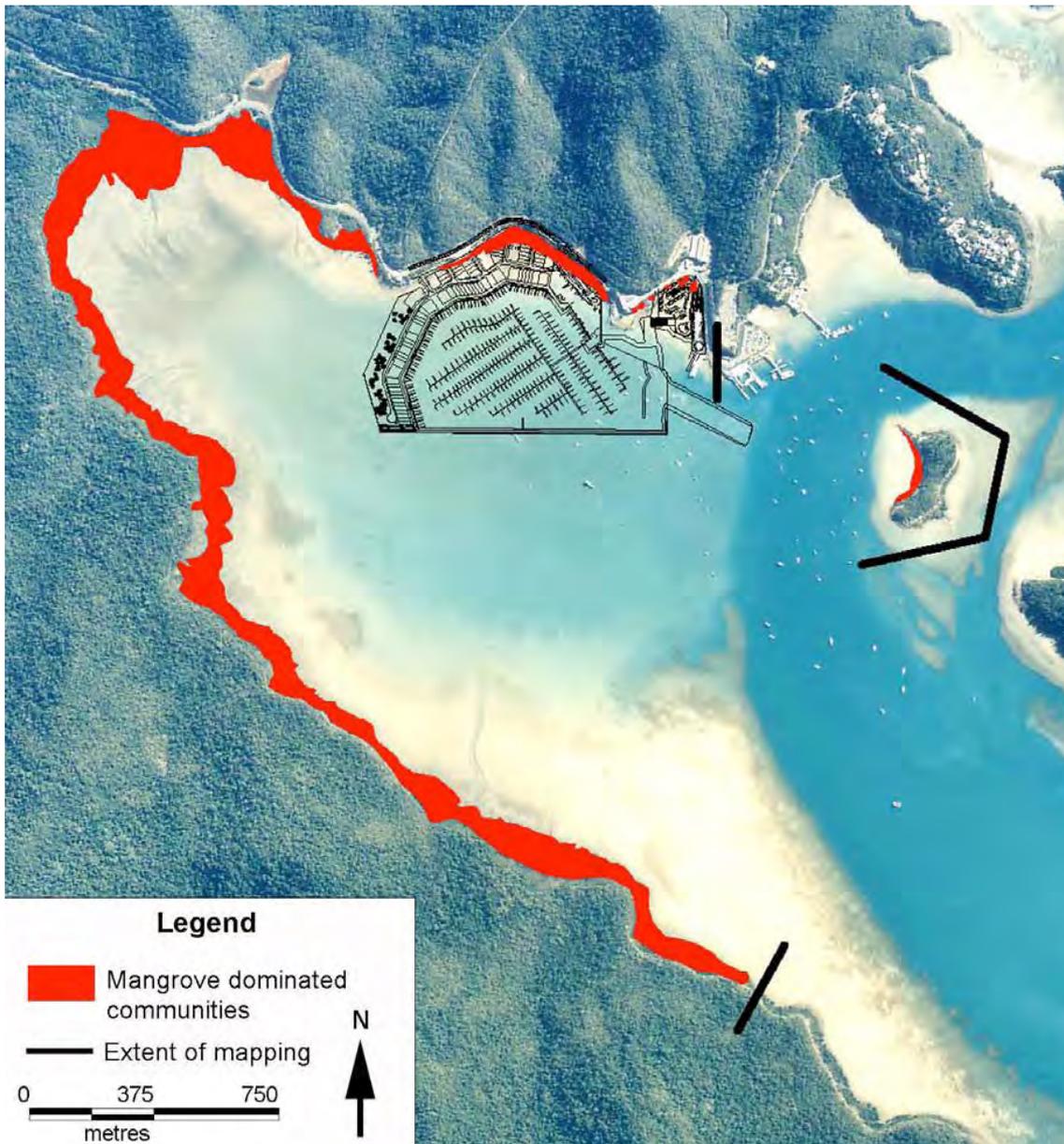


Figure 5.6 Distribution of mangroves in Shute Bay

Note: Marina design depicted in overlay since amended

Fish habitat

Shute Bay does not contain any declared Fish Habitat Areas (FHA) as defined under the *Fisheries Act 1994*. The nearest FHA is in Repulse Bay, approximately 40 km south of Shute Bay.

Seagrass communities within Shute Bay provide nursery habitat for larval and juvenile fish from a variety of commercially and recreationally important species, including trevally (*Carangoides* spp.), queenfish (*Scomberoides commersonianus*), dusky flathead (*Platycephalus fuscus*) and flounder (*Pseudorhombus* spp.).

Mangrove communities in the project footprint are utilised by transient species of little direct commercial or recreational value, including hardyheads (*Atherinidae* spp.) and silverbiddies (*Gerres subfasciatus*). No species of conservation significance were

recorded from the mangrove communities of Shute Bay during the 2004 and 2007 surveys.

Marine fauna

Marine fauna discussed in this section is limited to those species that are listed under the NC Act. The EIS identified through a literature review that marine turtles, dugongs and occasionally estuarine crocodiles frequent Shute Bay. Humpback whales do not enter the bay as it is too shallow but they are known to rest with their calves in the vicinity of Whitsunday Islands adjacent to Shute Bay. Inshore dolphin species such as the Australian snubfin dolphin and Indo-Pacific humpback dolphin are not expected to occur in Shute Bay as it is located outside the dolphins' range of occurrence. Therefore these species are not discussed in this section. See further discussion in Section 8: Matters of national environmental significance.

Shute Bay contains potential foraging habitat (seagrass) for marine turtles and dugongs. Other areas within the Whitsunday region contain better quality seagrass meadows that are more frequently utilised by turtles and dugongs.

No turtle nesting beaches occur in or near Shute Bay and no breeding sites occur within the Whitsunday area.

Dugongs

The dugong (*Dugong dugon*) is listed as vulnerable under the NC Act. Herds of dugongs are found in wide, shallow, protected bays and mangrove channels, and in the inside edge of large inshore islands, where they forage in large seagrass meadows.

Dugongs have a naturally low population growth rate due to their slow maturation, low birth rates and investment in their young, making dugong populations highly susceptible to both natural and anthropogenic influences.

The most recent dugong population survey conducted in the Great Barrier Reef was carried out in 1999 and found 353 dugongs in the Whitsunday region. Since that time the region has experienced several extreme weather events and increased coastal development, each with unknown effects on the dugong population in the Whitsunday region. The population is expected to be recovering but is sensitive to disturbances.

25 dugong mortalities were recorded in the Whitsunday region since 2009. The majority (21) of these were recorded in 2011, with four of the deaths attributed to natural causes and two deaths attributed to other anthropogenic causes. The cause of the death of the remaining animals is unknown¹².

Shute Bay is located between two dugong protection areas (DPA), with Edgecumbe Bay DPA to the north and Repulse Bay DPA to the south. These DPAs contain vast, high quality seagrass meadows compared to Shute Bay, which, when last surveyed had approximately 147 ha of sparse seagrass cover.

¹² Department of Environment and Heritage Protection. StrandNet. Available: <https://www.derm.qld.gov.au/strandnet/application> [accessed 24-9-2013]

Marine turtles

The following four marine turtle species have either been recorded or are highly likely to be present in Shute Bay:

- Loggerhead turtle (*Caretta caretta*), endangered (NC Act)
- Green turtle (*Chelonia mydas*), vulnerable (NC Act)
- Hawksbill turtle (*Eretmochelys imbricata*), vulnerable (NC Act)
- Flatback turtle (*Natator depressus*), vulnerable (NC Act).

These species are also listed under the EPBC Act (Refer Section 7: Matters of national environmental significance).

QPWS confirmed that all of the above species of marine turtles utilise the Shute Bay area and surrounds as feeding and resting grounds. Shute Bay contains suitable foraging resources for these species, but marine turtles are unlikely to be highly dependent on the habitat within Shute Bay because similar and better quality resources are widely distributed throughout the Whitsunday region.

Three adult green turtles and one hawksbill turtle were observed during a one day reconnaissance survey of the bay for the EIS in 2007.

Since 2009 at least nine marine turtle mortalities were identified as a result of boat strike in the Whitsunday region from Bowen to Ball Bay¹². Within Shute Harbour a total of five deceased marine turtles were identified in the same period with unknown causes of death.

No habitat (foraging, resting or nesting habitat) considered to be critical to the survival of marine turtles is present in Shute Harbour or in nearby bays and inlets. Therefore no habitat will be impacted by construction or operational activities of the project.

The dominant seagrass species found in Shute Bay during field surveys, *H. ovalis* and *H. uninervis*, are the preferred foraging species for green turtles. Green turtles are also known to forage on propagules of the *A. marina* mangrove species, which is seasonally present in Shute Bay.

Humpback whales

Humpback whales are listed as vulnerable under the NC Act and are known to use the passages in the Whitsunday Islands as resting and breeding grounds during the winter migration (June to August) to and from southern waters. They are unlikely to enter Shute Bay or the adjacent Molle Channel because of the shallow waters.

Crocodiles

The estuarine crocodile (also known as the salt-water crocodile (*Crocodylus porosus*)) is listed as vulnerable under the NC Act. The species is found in Australian coastal waters, estuaries, freshwater sections of lakes, inland swamps and marshes.

The closest crocodile population to Shute Harbour is approximately 40 km to the southwest at Proserpine River. Crocodiles have occasionally been sighted in the vicinity of the Laguna Quays Marina near Proserpine, to the south of the Whitsundays in Repulse Bay.

Shute Bay is located within the distribution range of the estuarine crocodile but does not comprise or adjoin any preferred or critical habitat including breeding sites for the species.

5.3.2. Proposed construction and operation

Project construction and operation activities that concern the marine and coastal environment include land reclamation and capital and maintenance dredging of the marina basin and access channel.

Marina basin

The marina basin is proposed to cover an area of 17.1 ha and provide berths for 395 vessels. Development of the marina basin involves construction of a 260 m long northern wall of 2.4 ha, a breakwater along the southern edge of the basin and reclamation of 7.6 ha of land to construct artificial headlands bordering the eastern and western sides. The entrance to the marina will be located at the southeast corner of the marina. The basin will be completely enclosed and dewatered prior to dry-excitation.

Development of the marina basin will commence with the construction of the artificial headlands using sheet piles that will be driven with either vibratory or hydraulic piling rigs. Sheet piles will be braced with continuous whalers along the inside of the piling wall and tied back with steel beams at approximately 16 m centres and anchored into the fill down to rock with driven tie back piles. Artificial headland walls will be filled with material excavated from the marina and imported clean fill.

The breakwater construction involves using interlocked caissons that will be installed using steel sheet piles. Caissons will be dewatered and then filled with clean imported material. Up to 20 000 m³ of imported fill will be required. Sheet piles will be driven by a hydraulic hammer fitted on a track mounted crane. The height of the breakwater will be set to withstand predicted sea level rises of 0.8m to the year 2100.

The proponent has advised that the final sheet pile type, profile, thickness, tensile strength and depth would be determined after detailed engineering design and site load testing has been completed. The proponent also advises that all revetments will be provided with whalers, tiebacks and soldier piles. It is not to be cantilevered. Lateral restraint would be achieved through the tieback design.

Temporary sheet piles will contain the entire marina basin area. The marina will be de-fished and dewatered in accordance with DAFF guidelines. The marina basin will be over dredged to a depth of -5.2 m AHD to extend the time that maintenance dredging will be required (approximately 10 years). Up to 420 000 m³ of marine sediment will be excavated from the marina. Excavated material will be used for land reclamation.

The reclamation area will be divided into a series of stockpile areas for geotechnical assessment, testing, blending, spreading and compaction. Water drained from the stockpiles will be collected and pumped to the tailwater treatment area. Any acid sulfate soil material will be separated and treated. Approximately 600 000 m³ of material is required for reclamation and the expected volume of imported material required to balance fill requirements is approximately 160 000 m³.

Pontoons in the marina are proposed to be supported from cantilevered circular piles that will be driven using a land-based crane-mounted pile driver.

The marina will then be filled with sea water and marina facilities will be installed. The construction methodology and program for the proposed marina is described in Appendix GS8 the SEIS.

Access channel

The access channel will be dredged using a cutter suction dredge. Capital dredging of the channel will involve over dredging to a depth of -6 m AHD to extend the time before maintenance dredging is required. The estimated volume of material to be excavated is 78 000 m³.

Maintenance dredging

Over-dredging will take place during capital works to delay the requirement for maintenance dredging. Timing of maintenance dredging for both the marina and access channel will be determined according to monitored siltation rates. Maintenance dredging is expected to be required approximately 10 years following construction and then every two to four years.

Dredged material will be pumped into geotubes and dewatered in a bio-retention basin located on the artificial headland to the west of the project site. Drained water will be captured and treated prior to discharge into the marina. Dried material will be removed in the geotubes from the project site to be disposed of at a location subject to a waste management agreement with WRC.

Conditions have been stated in this report (Appendix 1-3) relating to the management of maintenance dredging.

5.3.1. Project impacts and mitigation measures

Construction and operation of the marina basin and access channel may potentially impact on the marine and coastal environment through contamination from suspended sediment concentrations, disturbance of acid sulfate soils (ASS) and potential ASS (PASS), and pollution from marina activities.

Coastal processes

Sedimentation

Sedimentation rates within the marina basin are expected to be approximately 30 mm/year at the eastern side of the basin and 6 mm/year at the western side.

The proponent proposes to monitor sedimentation rates to confirm maintenance dredging requirements. The EIS notes the expected sedimentation rates, between 3000 to 4000 m³ of material would be required to be removed from the marina basin during maintenance dredging.

Sedimentation rates within the access channel are expected to be approximately 25 mm/year. At this rate, approximately 2000 m³ would be required to be removed from

the access channel during maintenance dredging. These figures would need to be confirmed by monitoring sedimentation.

Wave dynamics

The marina development is expected to alter the wave climate in Shute Bay, where significant wave height reduction in the wave shadow area west of the marina would occur. EIS modelling found that sediment suspended here appears to accumulate behind the western breakwater

Wave conditions in the marina will generally be calm with the longest wave periods expected to be experienced by the berths closest to the marina entrance. Wave climate at the berths will be influenced by wave generation within the marina. There is potential for waves to penetrate along the marina entrance channel and into the berth areas.

The proponent has proposed to mitigate the impacts of large waves on marina berths through installing stern mooring line piles at the most exposed berths.

Water quality

Water quality in Shute Bay may be impacted by increased suspended sediment concentrations during construction of the marina basin and dredging of the access channel, contamination from pollutants in stormwater, and oil spills from marina activities.

The proponent is required in Appendix 1, Conditions 17-21 to conduct water quality monitoring of the project area for at least 12 months prior to construction commencing. The outcomes of the water quality monitoring program will enable comparison between baseline data and receiving environment monitoring data obtained during construction and operation of the project. The additional 12 months of water quality data will allow the proponent to define local water quality objectives relevant to potentially affected local marine ecosystems. The outcomes of the water quality monitoring program must be submitted to the administering authority in support of an application for development approval. The water quality monitoring program must be designed in accordance with relevant legislation and guidelines including the Environmental Protection (Water) Policy 2009 (Proserpine River, Whitsunday Island and O'Connell River Basins Environmental Values and Water Quality Objectives) (2013) (Appendix 1).

Water quality will be regularly monitored during construction and operation activities to ensure that project activities comply with relevant water quality objectives.

Suspended sediment

Suspended sediment concentrations may increase in Shute Bay during construction and operation of the project. Construction activities that may result in increased suspended sediment concentrations include land reclamation, excavation of the marina basin and capital dredging of the access channel. Suspended sediment concentrations may also increase during maintenance dredging of the access channel and marina basin and during rainfall events that result in erosion.

The proponent has proposed to fully enclose the marina basin with a wall of temporary sheet piles and silt curtains to reduce impacts to the water quality of Shute Bay during

construction. Silt curtains will also be used to contain dredge plumes from dredging activities for the access channel.

Erosion and sediment control devices will be included in the project design including in stormwater diversion structures to reduce impacts from erosion on water quality in Shute Bay.

Pollutants

Sources of pollutants that may contaminate the water quality of Shute Bay include stormwater, runoff from roads and the car park, marine vessels and the refuelling station. Potential pollutants include litter and oils and chemicals associated with marina activities.

A stormwater channel that currently drains into Shute Harbour will be diverted around the project site. Diversion will take place during construction of the project and will remain a permanent structure. Other drainage channels adjacent to the project site cross Shute Harbour Road and are likely to transport pollutants from the road into Shute Bay.

The proponent has developed a stormwater management plan that details measures to mitigate potential water quality impacts from stormwater runoff, including reducing the amount of stormwater runoff leaving the site through onsite storage and reuse in construction requirements, dust suppression and revegetation. Gross pollutant traps will be installed in stormwater drainage structures to prevent litter from entering Shute Bay. Stormwater and runoff from the car park and roads will be treated onsite in bio-retention basins prior to discharge into Shute Bay.

Oil and chemical contamination may occur from accidental spills at the refuelling station and from marine vessel bilge water.

The proponent has proposed to mitigate impacts from oil and chemical spills through providing appropriate refuelling facilities and prohibiting vessel maintenance activities such as abrasive blasting and metal surface coating within the marina. Oil and grease separators will also be installed at the car park to capture oil from runoff.

Additionally, eight flushing pipes (2 m diameter) will be incorporated into the design of the marina basin to allow for adequate water circulation and flushing, preventing stagnant water and accumulation of pollutants within the marina. Marina flushing has been designed in accordance with USEPA guidelines, *Marine Flushing Management Measure II Siting and Design*. The guidelines require that, as a minimum, the marina flushing rate should be 85 per cent in 24 hours at neap tide.

Acid sulfate soils

The EIS identified small amounts of acid sulfate soil (ASS) material intermixed with calcium carbonate deposits in the seabed of the proposed marina. Geotechnical investigations undertaken for the EIS indicated that all ASS sampling results exhibited negative net acidity.

Queensland legislation requires adequate containment, treatment and management of runoff/leachate generated during the disturbance of ASS affected material in order to ensure the protection of coastal ecosystems, particularly wetlands and waterway areas.

The proponent has prepared an acid sulfate soil management plan (ASSMP) to ensure that the project does not result in significant adverse impacts from disturbance of actual or potential ASS.

WRC requires the proponent to submit a comprehensive ASSMP as part of the environmental management plan.

Coastal hazards

Cyclone

Cyclones are known to travel across the Whitsunday region, the most recent being cyclones Yasi and Ului which passed through the region on 3 February 2011 and 23 March 2010, respectively.

Numerical modelling found that maximum wave heights around the project area during a 10 per cent annual exceedance probability (AEP) event would be 0.91 m and 2.3 m during a 0.2 per cent event.

Modelling of wave climate inside the marina during a cyclone event with 40 m/s winds found that significant wave heights during a 10 per cent AEP event would be 0.36 m and 0.86 m during a 0.2 per cent event. The EIS stated that these results demonstrate that the marina would significantly reduce wave-related cyclone impacts within the marina, making it a safe harbour for boats.

The proponent has stated it will mitigate impacts from large waves within the marina through maintaining an attenuator pontoon with a draft of approximately one metre that can be placed across the entrance of the marina in preparation for a cyclone.

Storm tide

Shute Bay provides natural attenuation of storm surges from the east provided by three barrier islands however is open to storm surges and waves from the south east. The marina breakwater will be designed to withstand storm tide and wave impacts corresponding to the one per cent AEP storm tide level and an allowance for sea level rise of 0.8m at year 2100. The freeboard to habitable floor levels includes an additional allowance of 0.3 metres above the breakwater level.

Revetment pile caps have been set at 4.8m AHD to accommodate the highest astronomical tide plus:

- 0.5 metre cyclone storm surge;
- 0.1 metre wave setup allowance;
- 0.8 metre sea level rise;
- 0.7 metre safety factor;
- 0.4 metre deep pile cap.

Marine habitats

Seagrass beds

Based on the most recent survey, about 12.7 ha of seagrass beds will be cleared for construction of the project. Up to 9.61 ha will be cleared for construction of the marina

basin and up to 3.1 ha will be cleared for the access channel. This habitat loss will reduce the amount of potential foraging habitat available for green turtles and dugongs (Refer Section 5.3.1 for more information on impacts to these species).

The proponent has proposed to minimise seagrass loss as a result of the project by constraining dredging and marina construction to the approved footprint. The proponent will also install silt curtains and manage dredging and construction areas to minimise smothering of seagrass beds from sedimentation.

The proponent has committed (Appendix 5, C53) to developing a seagrass survey and monitoring program (SGSMP) that will include details of a pre-construction survey and annual surveys that will be conducted over three years following construction of the marina. The pre-construction survey will quantify seagrass coverage in Shute Bay and assist in determining the magnitude of impacts associated with construction of the marina. Post-construction annual surveys will monitor changes in seagrass distribution and composition in Shute Bay to determine whether performance indicators for water quality are satisfied.

WRC recommends that the proponent submits a rehabilitation plan to mitigate impacts from clearing seagrass, as part of the EMP. The EMP should also address difficulties in transplanting and re-establishing seagrass and where transplanting will take place.

The proponent has proposed several options as direct offsets for loss of seagrass including the following:

- restoration and rehabilitation of a large wetland to the west of the project area to improve the quality of stormwater entering Shute Bay
- identify upstream management actions to improve the quality of water in Repulse Bay, Pioneer Bay and Funnel Bay where seagrass coverage is being influenced by turbidity
- funding management actions identified for the Repulse Bay Declared Fish Habitat Area (FHA)
- contributing to Queensland Wetlands Program Response Action Plans for managing the impacts associated with in-stream structures in the Bowling Green Bay Ramsar wetland and declared FHA

The proponent has also proposed several indirect offset options, in case the direct offsets do not adequately meet requirements. Indirect options proposed by the proponent include the following:

- experimental restoration of seagrass in Mourilyan Harbour
- provision of funding to produce an annual update of the Queensland seagrass GIS atlas that incorporates all seagrass monitoring and mapping for Queensland
- contribution to the research program to establish a sub-lethal toolkit to rapidly measure seagrass stress.

Macroalgae

Approximately 14 ha of macroalgae beds will be removed through the excavation of the marina basin. The proponent has committed to reduce impacts to macroalgae by containing construction activities to within the approved footprint.

Mangroves

The entire mangrove habitat (1.84 ha) along the south edge of Shute Harbour Road in the project area will be removed for construction of the project and approximately 0.19 ha of mangroves may be indirectly impacted by dredge plumes.

The proponent has developed a draft offsets plan that details offsets for impacts to mangroves. The offset options proposed by the proponent include restoring and rehabilitating a wetland to the west of the project site and contributing to Queensland Wetlands Program Response Action Plans for managing the impacts associated with instream structures in the Bowling Green Bay Ramsar wetland and declared FHA.

The proponent has also proposed that the project will create 0.93 ha of land along the western side of the development that will be suitable for mangrove recruitment. The proponent has proposed to facilitate re-planting and establishment of new mangroves in this location.

Coral

Approximately 0.44 ha of coral in Shute Bay will be cleared for construction of the project, and dredge plumes from access channel dredging may impact on approximately 0.22 ha coral in the small bay to the east of the project.

Coral clearance would be unavoidable for construction of the project. The proponent has proposed to reduce incidental impacts to coral through constraining marina construction and access channel dredging to within the approved footprint.

Indirect impacts from dredge plumes on coral adjacent to the project site are proposed to be mitigated by installing silt curtains around dredging activities.

The proponent has suggested that construction of marina structures will provide substrate for recruitment of marine communities, including soft corals.

Fish habitat

The areas of fish habitat to be cleared for the project (12.7 ha of seagrass and 1.84 ha of mangroves) are minor compared to the total fish habitat in Shute Bay. No commercially or recreationally important species occur in the area and therefore will not be impacted. The EIS notes that the marine structures provide beneficial habitat for fish species potentially mitigating the loss of marine plants.

Marina fauna

The likely impacts to marine fauna as a result of the project include habitat loss, injury and potential fatality and habitat avoidance from construction and operation activities such as dredging, pile driving and boating. These impacts and the proponent's proposed mitigation measures are discussed further below.

Habitat loss

The seagrass in Shute Bay is a potential foraging resource for protected marine species including green turtles (*Chelonia mydas*—vulnerable, Nature Conservation Act (NC Act)) and dugongs (*Dugong dugon*—vulnerable, NC Act). Both of these species are also listed under the EPBC Act; refer to Section 7 for more information on MNES.

Approximately 12.7 ha of seagrass will be cleared for construction of the project. The dominant seagrass species in Shute Bay is *Halodule uninervis*, which is known to be the preferred foraging species for dugongs and green turtles. However, the coverage of *H. uninervis* is sparse in the bay and the area is not known to be frequented by dugong for foraging.

Dugong feeding trails were not observed during marine ecology field surveys for the project. Green turtles were identified in Shute Bay during reconnaissance surveys for the EIS, although they were not recorded to be seen foraging. However, it can be assumed that green turtles and dugong may forage on seagrass within Shute Bay although better quality seagrass meadows occur to the north and south of Shute Bay in the dugong protection areas at Edgumbe Bay and Repulse Bay.

As discussed on page 54 ('Seagrass beds'), the proponent has proposed to develop a seagrass survey and monitoring program (SGSMP) and to minimise incidental seagrass loss by restricting construction activities to the approved footprint and minimising smothering of seagrass beds from sedimentation.

The proponent has also proposed to support seagrass research programs as an offset for clearing seagrass, also listed under 'Seagrass beds'.

Boat strike

Currently there are 25 to 30 large (30 metre) vessel movements per day in and out of the barge and ferry terminals at Shute Harbour. Advice from representatives of the terminal operations is that vessel traffic from the terminal is likely to increase with growth in tourism on the adjacent islands.

Increased boating activity in Shute Bay and the Whitsunday region as a result of the project will increase the risk of boat strike to marine fauna in the area. Boat strike may result in injury or potential fatality in the worst case for marine fauna.

Dugongs and marine turtles travelling between Repulse Bay and Edgumbe Bay dugong protection areas and humpback whales resting in the passages of the Whitsunday islands are at risk of boat strike or boating disturbance from marine vessel traffic related to the project.

There are no recorded injuries or mortalities of humpback whales in the region as a result of boat strike. However, an increase in the number of marine vessels moving through the Whitsundays, as a result of the project, is likely to increase the risk of collision with humpback whales.

The proponent has proposed to mitigate impacts from boat strike on marine fauna through contributing to the development of a regional approach to managing increasing boating traffic in the Whitsunday region and implementing an education program to encourage the adoption of boating best practice.

The proponent intends to collaborate with GBRMPA and MSQ to implement 'go slow zones' in Shute Bay and adjoining waters. Speed limits within Shute Bay will be enforced by the proponent by implementing a three strike policy, where vessels observed to be exceeding the speed limit on three occasions will have their berthing

privilege removed and the vessel operator will be asked to leave the marina. A register of offenders will be maintained.

I note that a study of voluntary vessel transit lanes and speed limits in Missionary Bay, Hinchinbrook Island showed that voluntary measures were ineffectual at reducing incidents of boat strike on marine fauna.¹³

Underwater noise

Marine fauna are susceptible to impacts from underwater noise, which may cause the animals to avoid areas of habitat nearby the source of underwater noise and may cause injury to the auditory sensors of the species. Underwater noise may be generated by pile driving and dredging activities during construction and maintenance dredging of the project.

Underwater noise is unlikely to impact on humpback whales as their habitat in the Whitsunday region is beyond 500 m of the project site, which is the recommended buffer distance at which underwater noise levels would be environmentally acceptable (Refer Appendix 2.Schedule 2, Conditions 4-7).

The proponent has identified that low-impact pile driving methods such as vibratory or hydraulic piling, which do not generate high levels of underwater noise, will be used for construction to minimise underwater noise impacts on marine fauna.

Fauna spotters will be employed to monitor for the presence of dugong every 30 minutes within 500 m of pile driving and dredging activities during construction. If an animal is spotted, pile driving and dredging will be suspended until the animal has left the 500 m radius or has not been sighted for 10 minutes. Pile driving will then commence using a soft-start procedure.

The proponent has stated it will undertake underwater noise-generating activities such as pile driving and dredging outside of the humpback whale's migration period, i.e., June to October to further mitigate impacts to humpback whales from underwater noise.

Dredging

Dredge plumes from dredging may degrade the quality of seagrass habitat that is dugong and green turtle foraging habitat, through smothering and sedimentation. Dredge equipment also poses the risk of injury to turtles.

The proponent has stated it will mitigate these impacts through installing tickler chains during dredging to deter turtles interacting with the dredge equipment and through employing a fauna spotter to monitor for the presence of turtles during dredging as described above for pile driving activities. Indirect impacts from dredge plumes will be mitigated by installing silt curtains around dredging activities and water quality will be monitored during dredging activities to ensure that water quality criteria is not exceeded.

¹³ Groom, RA 2003. The efficacy of the voluntary vessel transit lanes in Missionary Bay, Hinchinbrook Island for dugong conservation management. James Cook University, Queensland.

Marine debris

Marine fauna may ingest or become entangled in marine debris associated with marina operations including ropes, etc. Ingestion or entanglement with material waste from the project may lead to illness and potential fatalities in marine fauna.

Other pollution such as contaminants including oil, heavy metals and pesticides may also cause harm to marina fauna.

The proponent has stated it will mitigate these impacts on marine fauna through managing material waste at the marina through the provision of bins and a litter collection program. Stormwater drains will be fitted with gross pollutant traps to prevent litter suspended in stormwater from entering the marina and stormwater will be treated in bio-retention basins prior to discharge into the marina (refer to Section 5.1.8: Project infrastructure for more information).

5.3.2. Coordinator-General's conclusions

I am satisfied that the proponent has adequately identified and assessed the impacts of the construction and operation of the project. The proposed construction and operation activities as defined are necessary for the project. Detailed development plans will need to demonstrate that the extent of habitat loss is minimised, particularly temporary turbidity impacts as a result of dredging. The design of the marina means it will be a safe harbour for boat during cyclones in relation to wave action. Design of the marina takes account of sea level rise to the year 2100 providing immunity in the event of climate variability affects.

All habitat types could be directly affected by the project with the additional potential impacts to seagrass beds and coral communities which may be indirectly impacted by sediment plumes from dredging.

I note that the proponent has identified several mitigation strategies in the EIS, including an offsets strategy and construction, dredge and rehabilitation management plans.

Necessary offsets will be determined in accordance with both state and Commonwealth requirements (Appendix 1).

Water quality

I have set conditions requiring that a further 12 months of baseline water quality data. I required the following outcomes I require as a result of the baseline water quality data include:

- development of local water quality objectives for the marine ecosystem, including sea grass and coral communities
- a clear baseline to inform impact monitoring during construction activities and operation of the facility, including maintenance dredging
- the development of end-of-pipe release criteria from the marina designed to meet the local water quality objectives during construction and operation of the facility.

I have stated conditions in this report to ensure the appropriate management of impacts to water quality during project construction (Appendix 1).

Dredging

I have set conditions requiring that all dredging for the project be undertaken under a dredge management plan to be developed for the project. The plan must take into account the indirect impact of sediment plumes on marine ecosystem, particularly sea grass and coral communities.

I required the following outcomes I require as part of the proposed construction works include:

- best practice dredge and construction management, that complies requires full containment for the construction of the marina basin and fit for purposed controls for the dredging of the entrance channel
- identification of alternative disposal options for the placement of dredge material both on shore and offshore
- the identification of the extent of the change in water quality as a result of detailed design and specific equipment for dredging

I have stated conditions in this report to ensure the appropriate management of impacts from dredging during project construction (Appendix 1–3).

Facility design

I have set conditions requiring that the design of the facility is sufficient to meet the water quality objectives, ensure loss of marine plants and fish habitat area is minimised that best practice design is implemented to avoid coastal hazards to the greatest extent possible.

I required the following outcomes I require as part of the proposed construction works include:

- flushing the constructed marina basin to meet 85 per cent of water within the marina basin with a 24hr period
- the dredge material rehandling facility to be designed and constructed to accommodate future maintenance dredging requirements with minimal impact on the marine environment
- limit the permanent loss of sea grass habitat to 12.7 ha

I have stated conditions in this report to ensure appropriate facility design (Appendix 1).

5.4. Terrestrial and marine offsets

5.4.1. Environmental offsets—regulatory framework

The Queensland Government Environmental Offsets Policy (QGEOP) provides an overarching framework setting the principles and requirements for delivery of state offsets. Under the framework of the QGEOP, there are currently four offsets policies that address specific environmental issues. The specific-issue offsets policies, and their regulating agencies are:

- *Policy for Vegetation Management Offsets* (version 3), 2011, DEHP

- *Queensland Biodiversity Offset Policy* (version 1), 2011, DEHP
- *Marine fish habitat offset policy*, 2012, DAFF
- *Nature Conservation (Koala) Conservation Plan 2006 and Management Program 2006-2016*, 2006, DEHP.

5.4.2. Coordinator-General requirements and approval

The QGEOP does not bind the Coordinator-General in assessing coordinated projects or activities from a holistic perspective under the SDPWO Act. The Coordinator-General has the discretion to consider the need for and decide on all types of offset conditions (and conditions in general).

The Coordinator-General has all the powers necessary to decide on offsets as part of his broad conditioning powers under the SDPWO Act. For example, sections 39 and 47C of the SDPWO Act provide the Coordinator-General with the general power to state conditions for development approvals and EAs respectively.

The Coordinator-General can take advice from relevant state agencies on offsets and will consider existing state offset policies but is the sole decision-maker on coordinated projects and will determine and approve any state offset conditions that are considered necessary over and above Commonwealth requirements to address significant residual impact.

5.4.3. Direct offsets

Terrestrial offsets

The project proposes to clear 0.94 ha of terrestrial vegetation to the south of Shute Harbour Road (between the road and the intertidal zone). The proponent has proposed to offset clearing 0.94 ha of terrestrial habitat. A final offset proposal must be presented to the Coordinator-General and Australian government for approval following further detailed investigations.

Marine offsets

The proponent proposes to clear the following areas of marine habitat:

- 14 ha of macroalgae beds
- 12.7 ha of seagrass
- 1.84 ha of intertidal mangroves
- 0.44 ha of coral communities.

The proponent has identified five options for offsets to direct impacts on marine habitat, including:

- restoration and rehabilitation of a large wetland to the west of the project site to improve water quality of storm water entering Shute Bay
- identify upstream management actions to improve water quality in other bays near Shute Bay, where turbidity affects seagrass growth
- investigate opportunities to remove private boat ramps in the Shute Harbour area and invest in mangrove rehabilitation

- fund management actions identified for the Repulse Bay Declared Fish Habitat Area
- contribute to Queensland Wetlands Program Response Action Plans for managing the impacts associated with instream structures in the Bowling Green Bay Ramsar wetland and declared fish habitat area.

5.4.4. Indirect offsets and other compensatory measures

Indirect offsets may be included with the offset package. The proponent has identified three research and education programs as options for indirect offsets that it would support:

- restore seagrass in Mourilyan Harbour
- provide funding to produce an annual update of the Queensland seagrass GIS atlas
- contribute to the research program to establish a sub-lethal toolkit to rapidly measure seagrass stress.

5.4.5. Coordinator-General's conclusions

The proponent's draft environmental offsets proposal and further advice from the proponent on offsets provided information on their estimated maximum loss of remnant vegetation, conservation listed species to be affected by habitat clearing and direct disturbance to marine habitats. Estimates of offset liabilities and potentially available offset sites were also provided.

The final environmental offsets plan must be provided for approval by the Coordinator-General, after the Commonwealth's decision. The proponent must now undertake relevant assessments and conclude offset arrangements with the Commonwealth on MNES. Once this work is complete, I will make my final determination on state offsets.

I have stated a condition requiring the proponent to submit an environmental offset plan, taking into account outcomes of the Commonwealth MNES assessment for my assessment and final approval on state offsets (Appendix 1).

5.5. Air quality

5.5.1. Context

This section of the report evaluates potential impacts of the project on air quality. Construction and operational activities could result in the emission of dust and other particulate matter, potentially impacting on air quality in the vicinity of the project site.

5.5.2. Potential impacts and mitigation

The SEIS stated that air emissions are expected to be generated from construction activities associated with the excavation of the marina basin. This excavation is expected to take place during months 16-24 of construction. Dust arising from this activity is the key potential air quality impact arising from construction of this project.

The proponent has provided a CEMP which addresses air quality through mitigation measures including:

- a 10 km/hr speed limit for all construction vehicles
- use of a water truck for dust suppression. Water used in this way will be either recycled water or captured stormwater.

In all cases air quality emissions standards are dealt with by the Environmental Protection (Air) Policy 1998.

5.5.3. Coordinator-General's conclusions

The proponent has signalled its intent to mitigate air quality issues through dust suppression. There are no other air quality impacts expected by the proponent, and no additional air quality impacts were identified through public and agency submissions.

Mitigation measures required to control impacts on air quality would be implemented through the CEMP for the project. I note that the proponent would be required to implement all measures contained within its CEMP in accordance with the EP Act and the subordinate legislation Environmental Protection (Air) Policy 1998.

Implementation of the CEMP and compliance within the air quality conditions, air quality impacts of the project can be managed within acceptable limits. If the measures proposed by the proponent are not sufficient then additional measures may be imposed by the assessing authority under any development application.

5.6. Hazard and risk

5.6.1. Overview

The project site is affected by tropical cyclones. The EIS stated that there are no hospitals, schools, medical facilities, emergency response and emergency management facilities in close proximity to the site. It further states that there is only one major road which provides access to and exit from the site in case of an emergency or disaster.

The devastation caused by cyclones such as Larry (2006), Ului (2010) and Yasi (2011) has highlighted the need for sound emergency management and response procedures to be in place for local residents, visitors, construction workers, businesses, industry and marine craft in the region.

Submissions lodged by state agencies identified the need for:

- the mitigation of hazards and risks
- the provision of emergency response infrastructure (addressed in Section 6: Infrastructure)
- backup power
- uninterrupted and adequate water supply and pressure
- access to the development area for emergency response vehicles, boats and helicopters during all stages of the development
- consultation with those agencies during the preparation of environmental management plans

- biosecurity: other risks include the introduction and impact of pests and weeds on the immediate and surrounding environments brought into the project area by machinery and persons working, living or visiting the project area by land, or by sea.

5.6.2. Issues

Disaster management

Disasters result in serious disruption to a community and require a significant coordinated response by the State and other entities to help the community recover. A serious disruption includes the loss of human life or illness or injury to humans, severe damage to or loss of, property and the natural environment.

WRC has a Disaster Management Plan which has been prepared in accordance with the *Disaster Management Act 2003* and the State's disaster management policies and guidelines. The proponent is required to ensure that safety or emergency response environmental management plans accord with the requirements of this plan.

Flammable and combustible liquids

Section 3.5.7 of the EIS includes an estimate of the maximum quantity of fuels to be stored on site. It is anticipated that the marina will hold 50 000 litres of diesel and 20 000 litres of unleaded petrol. These fuels will be stored in double lined underground facilities in accordance with AS1940.

The refuelling facility will provide storage of diesel and fuel products classified as Dangerous Goods under the Australian Code for the Transport of Dangerous Goods Code by Road and Rail. Storage and handling of such materials provides an increased risk that requires specific handling to ensure that environmental harm is not caused.

The proponent aims to reduce the risk of environmental harm or incidence caused through the storage and use of hazardous substances. The EIS stated that the proponent will comply with the legislative requirements and relevant Australian Standards for the handling of dangerous goods and hazardous materials.

Emergency management and response

The EIS provided information on the anticipated types, amounts and storage of flammable and combustible liquids and hazardous chemicals, the transportation of dangerous goods, boating and motor vehicle accidents, (including during construction), emergency response facilities and cyclone and incident evacuation possibilities.

The location of the development in a cyclone area requires the preparation and implementation of a risk management plan and emergency management and response plan for all stages of the development including when fully operational. The proponent stated in the EIS that it would ensure consultation with the relevant authorities during the preparation and finalisation of all emergency response and management plans required during pre-construction, construction and operation of the development. The proponent has committed to the preparation and implementation of a cyclone evacuation plan (C24).

The Public Safety Business Agency is responsible for the delivery of the Queensland Ambulance Service, Emergency Management Queensland and the Queensland Fire and Rescue Service. Maritime Safety Queensland is responsible for the delivery and management of maritime emergency services response infrastructure. Their submissions on the EIS advised that there is no infrastructure to service and respond to disasters, emergencies or incidents within the project site.

Maritime safety

The EIS addressed the risks associated with marine vessels and has provided information which addresses the impacts of the construction and operation of the marina, boats mooring at the marina and visiting the marine area.

MSQ is responsible for the management of the safety of vessels, their operations and the marine environment. The proponent has stated in the EIS that it will consult with MSQ, the Regional Harbour Master DTMR during the preparation and finalisation of all emergency response and management plans required during pre-construction, construction and operation of the development.

Pests and weeds

Federal, state and local government policy and legislative frameworks determine how pests and weeds will be managed in Queensland. Pests and weeds are identified in the EPBC Act and in Queensland's nature conservation and land protection legislation, policies and guidelines on matters such as declared plant listings, flora, fauna and weed registers.

The proponent has stated in the EIS that it will prepare a draft environmental management plan in consultation with Biosecurity Queensland, Department of Agriculture, Fisheries and Forestry (DAFF). The plan will identify procedures to identify pests and weeds, control measures, prevention of the spread of pests and weeds, monitoring mechanisms, data management and reporting arrangements, training and education for workers and those living and visiting the development. The proponent has also committed to weed management by ensuring that all fill is obtained from approved locations and is bare of all vegetative and seed matter reducing the chance of the introduction of any other weeds to the area (C47).

Mosquitos

Mosquitos can be vectors of diseases that are harmful to humans. Shute Bay is known to be a breeding area for four species of mosquitos:

- *Ochlerotatus vigilax*
- *Coquillettidia xanthogaster*
- *Culex annulirostris*
- *Ochlerotatus notoscriptus*.

WRC currently manages mosquito outbreaks in the region by conducting adulticiding, larvaciding, biological control and habitat modification through emptying water containers and adding chlorine to swimming pools.

The proponent has committed that mosquitoes will be controlled through design of the SHM by avoiding the creation of breeding habitat (C48). Measures manage mosquitos on the project site include:

- avoiding the creation of artificial ponds, during earthwork design. Stormwater and dredge tailwater treatment systems are excepted
- bio-retention ponds (for stormwater treatment) shall be monitored in accordance with relevant guidelines
- ensuring the site is free draining to minimise surface ponding of water
- habitat modification in preference to a reliance on chemical control
- avoiding the creation of large areas of vegetation which may provide mosquito harbourage and movement corridors from identified breeding areas near the development site.

Queensland Health has advised that the proponent's measures to manage pests and vermin adhere to the provisions of the *Public Health Act 2005* and Division 3 of the *Public Health Regulation 2005*. The department also advises that the proponent's measures to manage and monitor mosquitos onsite must be managed in accordance with the *Public Health Act 2005* and Division 2 of the *Public Health Regulation 2005*.

5.6.3. Coordinator-General's conclusions

I consider that the hazard and risk assessment and draft environmental management plans contained within the EIS and the SEIS adequately demonstrated that all potential hazards and risks can be managed by way of environmental management plans, conditions attaching to development approvals, permits, licences and authorities issued pursuant to the State and local government's safety, emergency response, disaster management, environment and planning legislation.

I require the following outcomes:

- the Regional Harbour Master approves the maritime-related sections of any development plans, prior to the implementation of those plans
- the location of the marine access channel does not interfere with the safe operation of the ferry and barge terminals and meets MSQ safety requirements
- minimisation of risk to navigational safety resulting from the construction and operation of the proposed development. In particular, ensuring all necessary maritime safety infrastructure and supporting systems (particularly aids to navigation) are established and maintained throughout the lifecycle of the development
- during its lifecycle, the project does not introduce new terrestrial or marine pests, nor spread existing terrestrial or marine pests
- prevent the spread of mosquito borne diseases
- emergency management and contingency plans are developed and implemented for all stages of the project
- establish and maintain an emergency services centre comprising sea rescue and emergency services and a fully equipped community cyclone shelter (capable of

withstanding category five cyclones) for residents, visitors and the operational workforce

- provision of parking/berthing facilities for emergency services vehicles/vessels
- all fire systems installed in the development must be approved by QFRS.

I have stated conditions in this report to ensure the appropriate management of hazard and risk (Appendix 1).

5.7. Cultural heritage

5.7.1. Non-Indigenous cultural heritage

The project site is not known to be an area of potential significant non-Indigenous cultural heritage items or sites. Submissions received during public and agency consultation did not raise non-Indigenous cultural heritage issues.

In the event that non-Indigenous archaeological items are located within the development site during construction, the proponent should, consistent with the requirements of section 89 of the *Queensland Heritage Act 1992*, advise the DEHP within 24 hours of the discovery and seek advice. Such items discovered must be recorded in accordance with the DEHP guidelines 'Archival Recording of Heritage Places.'

Site Investigations

The EIS referred to a site study undertaken in 1991, where investigations of the project site conducted as part of this EIS found no non-Indigenous items of cultural significance. No ground survey after this date is referred to. A database search for shipwreck sites was also undertaken as part of the EIS preparation which found no recorded shipwrecks in Shute Bay.

5.7.2. Indigenous cultural heritage

The *Aboriginal Cultural Heritage Act 2003* includes a provision under Section 23 whereby proponents of projects which require an EIS must prepare a cultural heritage management plan (CHMP) which provides for the management of Indigenous cultural heritage.

A CHMP has been prepared by the proponent in consultation with representative of local Indigenous (Gia and Ngaro) peoples. At the time of writing this evaluation report there is no existing application for native title over the project area.

Form letters and submissions received during the public consultation process referred to the proposed Indigenous cultural heritage centre arising from the project as a positive benefit for local Indigenous people. Submissions also referred to Indigenous employment opportunities.

Site investigations

Indigenous cultural heritage investigations of the project site were undertaken as part of the EIS. I note that these investigations did not include examination of the area north

of Shute Harbour Road, as this was not expected to be disturbed during construction or operation. The investigations found little archaeological evidence on the project site, though this was expected as the tidal nature of the site was known to erase evidence of occupation. In addition there has been significant ground level disturbance to the area.

The area north of Shute Harbour Road was the subject of a 2002 cultural heritage survey, which revealed no sites of archaeological significance.

5.7.3. Coordinator-General's conclusions

I am satisfied that the proponent has given due care and attention to the formulation of an Indigenous cultural heritage management plan, as required under the *Aboriginal Cultural Heritage Act 2003*.

I am also satisfied that the proponent is capable of following the requirements of section 89 of the *Queensland Heritage Act 1992* in the event non-Indigenous archaeological items are located during construction.

I am aware that the CHMP is being disputed by Indigenous tribes not party to the agreement. I therefore require that a current CHMP is in effect at the time construction commences.

5.8. Social impacts

I have assessed potential social impacts arising from the project against the TOR for the EIS. Potential positive impacts include:

- direct local and regional employment opportunities during the construction and operational phases of the project
- local and regional contracting and supply opportunities for individuals and businesses including marine and tourism industry operators
- additional community infrastructure and commercial facilities for local and island residents.

Potential adverse impacts requiring mitigation or management include:

- a loss of amenity for Shutehaven residents and Shute Harbour ferry terminal users during construction works onsite and along Shute Harbour Road
- increased road traffic along Shute Harbour Road during the construction and operational phases of the project giving rise to road safety concerns
- visual intrusion of the marina and built form components in a low density residential environment.

5.8.1. Government policy

The Queensland Government has committed to streamlining regulatory and approval processes, including the cost and complexity of the EIS process for coordinated projects, as a means of reducing costs to industry, clearly identifying specific outcomes and helping to grow a four-pillar economy.

In support of these objectives, I have developed a new SIA Guideline to assist proponents to effectively identify, assess and propose measures to mitigate the social impacts of coordinated projects. Under the guideline, the requirement to complete a SIA as part of the EIS process remains unchanged.

The components of a SIA include:

- community and stakeholder engagement
- workforce management
- housing and accommodation
- local business and industry content
- health and community wellbeing.

The guideline is available on the Department of State Development, Infrastructure and Planning website at: www.dsdip.qld.gov.au/assessments-and-approvals/social-impact-assessment.html.

The TOR for this project were finalised in 2007. Given the time taken to finalise the EIS, my assessment of the potential social impacts of the SHM project is based on the relevant components of the current Government policy to ensure that the outcomes are consistent with other similar coordinated projects.

5.8.2. Impact assessment, mitigation and management

Community and stakeholder engagement

The proponent completed a stakeholder engagement process during preparation of the EIS in accordance with the requirements of the TOR. This included a community attitudes study into the issues surrounding the proposed development. A significant majority of respondents agreed that tourism is vital to the region's economy, and were broadly supportive of local marina development on the basis that it would benefit the tourism industry.

Over three quarters of local residents surveyed indicated that the current infrastructure at Shute Harbour needed to be improved. Opposition to the actual proposal presented at the time was more pronounced amongst residents of Shutehaven and Shute Harbour, and particularly amongst those who felt that the level of infrastructure at Shute Harbour is adequate. Concern for the environment was the key factor impacting negatively on support for the project.

Housing and accommodation

The project workforce is expected to peak at approximately 107 FTE workers during the construction phase, and the proponent expects most employees to be drawn from the local area and region. As such, the workforce is not expected to have any impacts on local housing markets requiring mitigation or management. While most of the accommodation provided by the project will cater to the short stay tourist market, the smaller permanent accommodation components may provide housing options that respond to increasingly diverse housing needs in the community.

Health and community wellbeing

The project is likely to result in increased vehicle movements along Shute Harbour Road, the only land based access route to the site. The Department of Health has noted that the increased risk of road trauma could impact on regional health services, particularly the need for emergency first response.

The inclusion of bus stops and turnaround facilities at either end of the project site improves transport links between Shute Harbour, Airlie Beach and centres beyond for employees, local residents and visitors, and may facilitate increased patronage on the existing bus route. The requirement for mitigation of impacts on the road network is discussed in more detail in Section 6: Traffic and transport.

The SHM site is bordered by the Conway National Park and Shute Harbour with views to the Whitsunday Islands beyond. Local residents highly value the scenic amenity afforded by this location, including uninterrupted views of the harbour and the ridgelines behind the coast. A visual amenity and landscape character assessment report was included as Appendix J of the EIS.

I note the proponent's intent to design and locate the built form components of the project in a manner that:

- limits visual impacts and remains subservient to the overall landscape character
- responds to the site's adjoining natural topography
- reflects the character of the Whitsunday region and its status as a resort catering to a world class facility.

In particular, the bulk and scale of the development has been linked to the scale of the mast of the yachts in the marina and the context of the adjoining landform. Buildings within the resort hotel precinct allow for a mixture of activities to be co-located, and the height of the buildings is limited to 5 stories which links visually with the elevated ridgeline and headland adjoining the site to the northeast.

A proposed SHM development code has been developed to guide the development of the project in accordance with these and other principles. The code was included as Attachment GS3 of the EIS and is given further consideration in Section 5.1.4 of this report.

Indigenous employment

The EIS reported that the construction phase is expected to require up to 107 FTE employees with the majority of labour expected to be sourced locally. The operational phase is expected to require up to 245 employees with 75 per cent (184) of these anticipated to be filled using local labour.

Additional information supplied by the proponent reported that the Indigenous Cultural Centre presents a cultural tourism business opportunity and potential employment for these owners and their descendants.

5.8.3. Coordinator-General's conclusions

The project has the potential to improve access for local residents to a range of commercial and retail facilities, and vital community infrastructure, including a public cyclone shelter and emergency rescue facilities. In addition to the employment generated during construction, the marina may also act as an important catalyst for growth in the related marine and tourism industries that are critical to the Whitsunday economy.

I have reached the conclusion that the potential adverse social impacts of this project can be adequately mitigated and managed by the proponent. I expect that the proponent will continue to consult with the local community to demonstrate the value of the project and capitalise on all its positive benefits. I also expect the proponent to reinforce their commitment to minimise impacts during the construction and operational phases.

I have recommended that the proponent develop Indigenous employment strategies and targets for both construction and operation phases of the project (Appendix 4, Schedule 2, Recommendation 2).

6. Traffic and transport

A preliminary assessment of road impacts was undertaken in the EIS (Appendix K1). Additional information (Appendix GS22) stated that vehicular access to the project site will be able to be maintained via a single un-signalised T-intersection on Shute Harbour Road which will be upgraded by the proponent. A marine traffic study (EIS, Appendix K2) evaluated the existing marine transit lanes and the potential impact of SHM on existing marine transport and traffic, including marine infrastructure.

Submissions received on the EIS and additional information raised issues in relation to transport including:

- adequacy of information on traffic generation and road impacts—in particular impacts of project-generated traffic on existing roads
- details of works related to a new intersection required for traffic access to the project during construction and operation
- appropriateness of the access channel location
- health and safety issues arising from project-generated traffic.

6.1. Road transport

6.1.1. Existing road network

The project site is accessed by Shute Harbour Road, a state-controlled road managed by DTMR. Shute Harbour Road runs from the Bruce Highway through Cannonvale and Airlie Beach and past the proposed project site, ending at Shutehaven, a short distance to the east. With no other roads planned for the area, access will be via Shute Harbour Road. The section adjoining the site frontage is a two lane undivided road with a total sealed pavement width of approximately 6.0–6.5 m with unsealed shoulders. No pedestrian paths, bicycle lanes or bus stops are provided within this road reserve. This road provides for limited overflow parking for vehicles with boat trailers and heavy vehicles waiting to unload barges. The speed limit is 60 km/hr with 50 km/hr advisory speeds for bends.

On-road parking is allowed along the eastern end of Shute Harbour Road. This is mainly used as overflow parking by cars with boat trailers. On worst case occasions, this extends past the proposed site access.

6.1.2. Road transport Impacts

Additional road traffic will be generated by this project:

- in the construction phase through delivery of construction materials, equipment and consumables, and construction workers using bus transport to and from the site
- in the operational phase from resort visitors and employees arriving by road transport, and through road delivery of consumables.

The project is expected to increase annual average daily trips (AADT) during construction and operation. Updated operational traffic figures were provided in

correspondence to the Coordinator-General by the proponent in August 2013 (refer Table 7.1). The figures estimate that the operational phase of the project will generate 1930 vehicle movements per day. The visitation figure of 88 400 people from the AEC Cost Benefit Report (SEIS, Appendix G6) was used as a basis to calculate operational road trips generated by the development using DTMR's Road Planning and Design Manual and the Roads and Traffic Authorities Guide to Traffic Generating Developments:

Table 6.1 Predicted vehicles per day (VPD) generated by the operational phase of the project

Land use	Floor area	No. of units	Vph/100 m ²	VPD rate	Subtotal VPD
Managed resort		49		6	294
Retail	1845		12		221.4
Restaurant and cafes	605		5		30.25
Marina Berths		395		1	395
Resort hotel		109		4	436
Cultural centre	1000		12		120
Emergency services facility	575		3.4		19.55
Retirement resort		70		4	280
Sailing club	1745		5		87.25
Charter base	605		3.4		20.57
Marine education facility	460		3.4		15.64
Marina offices	315		3.4		10.71
Total VPD					1930.37

Construction workforce traffic impacts

The EIS stated that construction employees using bus transport would originate from Cannonvale and Airlie Beach.

Car parking

The proponent's CEMP states that car parking will be provided on the construction site to remove the need for vehicles to park alongside Shute Harbour Road. In their submission on the EIS, DTMR requested that details of parking provisions within the construction site to accommodate construction traffic should be provided. The proponent responded that it anticipates that the first stages of the project would require limited car parking, with the majority of workers being heavy equipment operators. Prior to the establishment of temporary parking on the project site, the proponent expects that workers who cannot park on site will be bussed into and out of the site via shuttle buses at the developer's expense. The proponent also advised that it would actively encourage workers to participate in car pooling and use public transport.

All operational car parking for the development will be positioned under buildings or at ground level so that it can be fully integrated into the building design. I am satisfied that the proponent's measures will mitigate impacts to Shute Harbour Road from vehicle parking during construction or operation.

Delivery of construction materials

The proponent has advised that construction materials will be delivered solely by road. Delivery of construction materials to the site will have an impact on Shute Harbour Road. The road traffic impact assessment (SEIS, Appendix GS22, Appendix D) calculates a total of 21 038 truck loads are required to deliver materials to the site for the marina, breakwater, earthworks and upgrading of Shute Harbour Road. This process is expected to last 30 months and does not include delivery of building materials required for construction of the hotel, managed resort accommodation and other buildings. The proponent will be required to supply further detailed information covering truck movements in its traffic management plan (TMP) to DTMR at the detailed design stage.

Subsequent to the SEIS submission process the proponent provided information identifying transport routes for construction fill material and sheet piling. The proposed routes to the project site are:

- Cannonvale Quarries, located 35 km from the project site is the origin of the imported fill to be used in construction. Delivery to the project site is via Shute Harbour Road
- Port of Brisbane, approximately 1100 km from the project site is the origin of sheet piling material to be delivered to the construction site. Delivery will involve a total of 389 trips to the project site via the Bruce Highway

The proposed routes are shown in Figure 6.1.



Figure 6.1 Origin and road transport route of construction materials



Sheet Piling
 Ex Port of Brisbane
 Distance: 11000km approximately
 Route: Bruce Highway & Proserpine Shute Harbour Road

In order to minimise the impacts of excessive emissions and engine noise from braking and gear changing, the preferred route for heavy vehicle movement is proposed to avoid entering the town centre of Airlie Beach where sensitive places, including commercial holdings, are directly adjacent to the road. Heavy vehicle movements are instead proposed for Waterson Way where existing residential dwellings have sufficient setback distances.

Road safety impacts resulting from the delivery of construction materials could include:

- congestion
- speed/stopping distances required for heavy vehicles
- vehicle separations
- lack of driver and public awareness
- pedestrian movements.

Mitigation and management options proposed by the proponent include:

- regulate travel times (off peak times)
- enhanced speed monitoring
- hazard/warning lights on trucks
- digital road side signage alerting the public to truck movements, times and speed
- enhanced vehicle signage including high visibility paintwork
- truck driver education and training
- computer tracking of truck movements, speeds and routes taken
- publicity and advance notices in local press, community services and the development website
- establishment of a complaints hotline and process for resolution.

Pavement impact assessment

A draft pavement impact assessment has been submitted by the proponent in accordance with DTMR's *Guidelines for Assessment of Road Impacts and Development* (GARID) to determine whether any contributions towards to cost of increased maintenance are necessary.

The assessment shows that construction trips will have an impact and must be mitigated. At the time of publication of this report the assessment is not finalised for roads other than Shute Harbour Road which will have a new intersection as a result of this project, linking the road with the resort.

6.1.3. Coordinator-General's conclusions

I note an initial pavement impact assessment (SEIS, Appendix GS22) for state-controlled roads has been undertaken by the proponent, in accordance with GARID.

A final road impact assessment (RIA) will be carried out by the proponent in conjunction with the drafting of a road-use management plan (RMP), logistics plan and TMP to be prepared when a contractor is appointed. The final assessment is to be

prepared by the proponent in consultation with DTMR. The results of the assessment will form the basis for entering into infrastructure agreements with DTMR and establishing road maintenance contributions.

I require the proponent to manage its road transport impacts and achieve the following outcomes:

- at all times and for each stage of the project, the proponent must maintain the safety, condition and efficiency of state-controlled and local roads
- completion of required road works prior to the commencement of project construction
- pre-construction liaison with DTMR is undertaken no later than nine months prior to the commencement of project construction
- completion of a RIA and RMP no later than six months prior to the commencement of project construction
- the upgrade of Shute Harbour Road occurs under the terms of the 1999 Deed of Agreement with DTMR
- relevant licences and permits are obtained and relevant plans and detailed drawings are submitted no later than three months prior to the commencement of project construction
- adequate provision for parking on the project site during construction and operation.

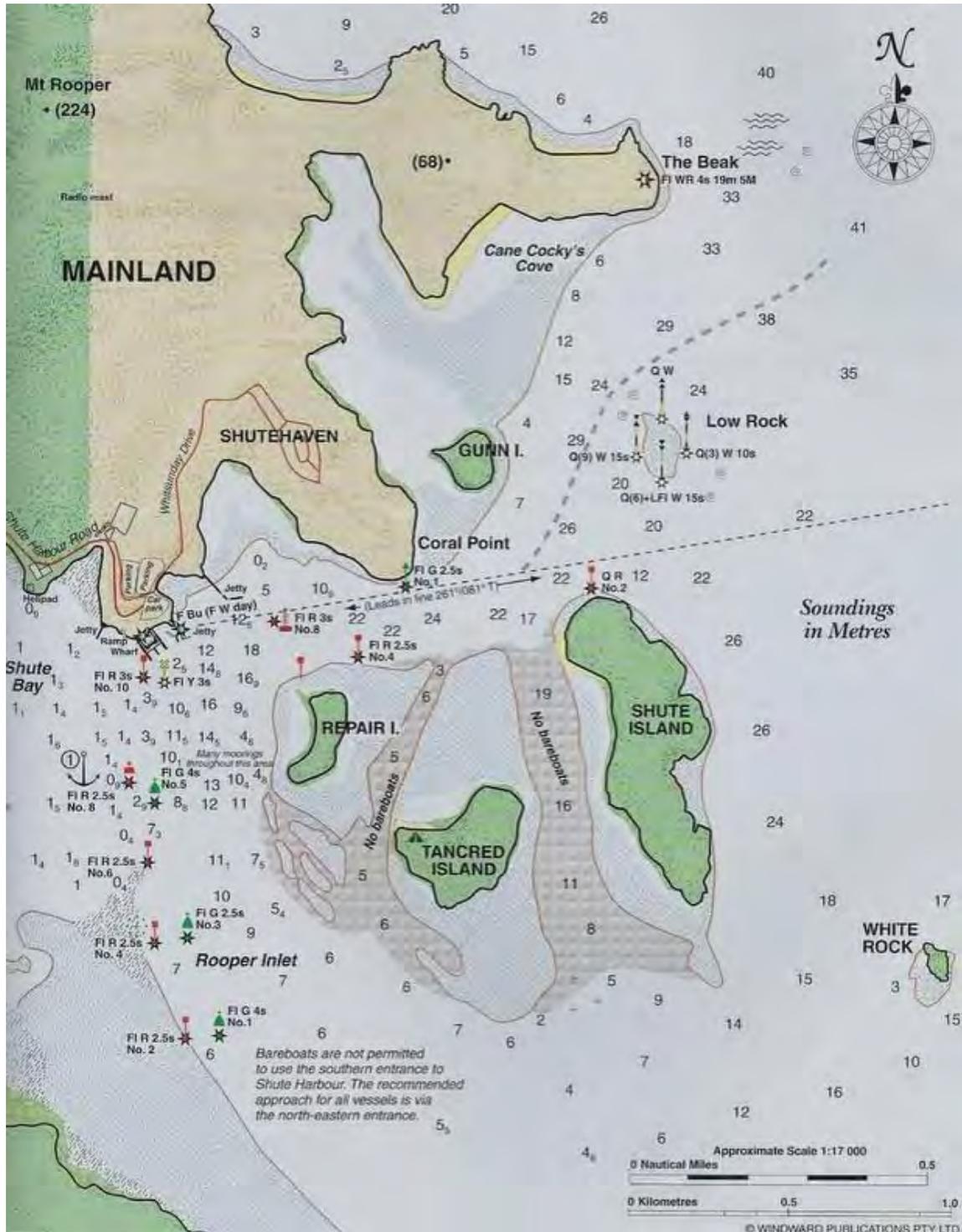
I have stated conditions to ensure minimal impacts by the project on the safety, condition and efficiency of state-controlled and local roads. (Appendix 1, Conditions 58-60). I have also recommended the proponent undertake pre-construction consultation with DTMR (Appendix 4, Recommendation 3).

6.2. Maritime transport

Shute Harbour (as shown in Figure 6.2) is the closest harbour to offshore resort islands including Hamilton Island, Long Island and Daydream Island. It is the base for commercial activities ranging from barge services to the hire of single kayaks.

Rooper Inlet and Shute Bay are generally shallow with sand and mangrove lined mud banks that dry extensively at the head whilst being fronted by drying coral reefs that present a danger to mariners. From seaward, the harbour can be accessed through the well-defined channel that leads north-east from the commercial wharves out past Low Rock (20° 17.3'S 148° 48'E), marked by cardinal marks, out into the Molle Channel. An alternative channel exists within Rooper Inlet that leads north-south and is marked by port and starboard hand markers. This channel passes south of Shute, Repair and Tancred Island and the mainland, all of which are fringed with coral reefs.

Figure 6.2 Shute Harbour Marine Chartlet



6.2.2. Existing maritime transport infrastructure

The proponent reports the following existing maritime transport infrastructure located east of the project site:

- ferry terminal used by ferry operators to service resort islands in the area. The terminal complex also includes a bareboat charter service
- barge jetty serving barges that travel to and from resort developments on nearby islands to provide supplies and collect rubbish
- council jetty providing berths for up to six vessels
- Whitsunday Rent a Yacht jetty, a base for a bareboat charter operator
- public boat ramp used by recreational users, mainly at week-ends
- over 300 swing moorings located across Shute Bay. These are administered by DTMR through Maritime Safety Queensland (MSQ).

6.2.3. Maritime transport impacts

Maritime transport impacts will occur during construction and operation and will involve:

- construction barges and dredging operations during construction
- the removal of a number of swing moorings in Shute Bay as part of construction
- impacts involving the replacement of swing moorings in Shute Bay but outside the construction area with new environmentally friendly moorings, as per the proponent's commitments in relation to environmental impact offsets
- additional boat traffic entering and leaving Shute Bay during operation.

A marine traffic study was undertaken for the EIS reported no specific opposition to the marina development from associated stakeholders, provided that there is no direct impact on their respective businesses. MSQ has advised that the proximity of the proposed marina to commercial boating activities is not expected to pose problems to marine traffic as long as arrangements are put in place to segregate the recreational and commercial marine traffic in areas where there is the potential for conflict. The study concluded that although there will be a significant increase in marine traffic by the development of the marina, this increase will occur over time and should be managed by proper monitoring of regulation compliance by the appropriate authorities.

Maritime transport management

The development of the marina facility would increase marine vessel activity in the region. This would include:

- up to 395 boats accommodated in the marina
- ferry movements to and from offshore islands
- commercial barge movements
- visiting recreational boats (nearby Abel Point Marina has berths for over 500 boats)
- recreational vessels using the boat ramp.

Marina access channel

Marina traffic entering or leaving the resort will use a designated access channel (Figure 6.3) that will be clearly signed and forms the only water access to and from the marina.

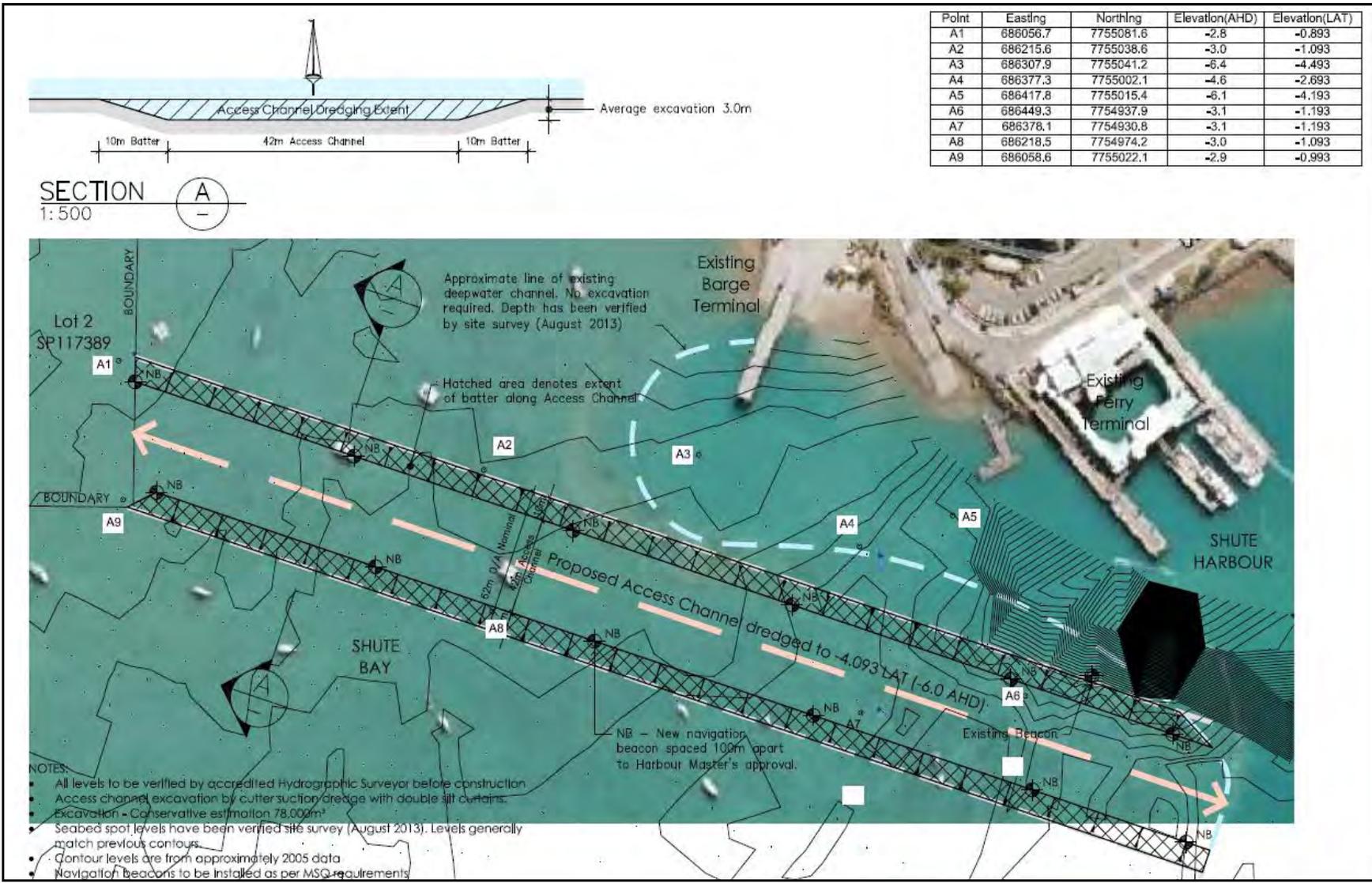


Figure 6.3 Marina access channel location

The marina access channel will connect the marina entrance to the existing navigation channel used for the barge terminal and ferry terminal. The position of the channel will create additional marina traffic in the vicinity of the existing ferry terminal and public boat ramp. Positioning of the channel has been designed to provide sufficient area between existing marine transport infrastructure and the marina development. Navigational aids will be appropriately located to prevent recreational craft from SHM passing in close proximity to the barge, ferry and boat ramp facilities.

Impacts to marina traffic include dredging taking place in areas used by vessels accessing the public boat ramp, barge terminal, and ferry terminal. Both capital and maintenance dredging will produce a navigation hazard in Shute Bay that was not previously present. The proponent's CEMP notes that navigation aids, signage and lighting will be provided to warn boat operators of the new hazards.

Traffic separation scheme

The EIS identified increased traffic movement through the north east channel of Shute Harbour as an issue requiring mitigation (Appendix K2). Although the north-east channel is well marked and has a set of leading marks/lights to assist vessels to approach and depart safely, the EIS proposed the introduction of traffic separation within the channel itself. Traffic separation further enhances safety by minimising the risk of collision between vessels on reciprocal courses entering and leaving Shute Harbour simultaneously. The proposal would be to keep outgoing vessels on the southern side of the channel and incoming vessels on the northern side. The traffic separation scheme will require some additional nav aids and specific communication with users.

I acknowledge that navigational safety could be improved in the north east channel by the introduction of a traffic separation scheme. I have been advised by the Regional Harbour Master that a traffic separation scheme must be a feature of Shute Harbour, providing a safety mechanism for all users.

Speed limits

The Schedule of Speed Limits in Queensland (MSQ, 2008) stipulates that the waters of Shute Harbour (including Shute Bay) have a declared speed limit of six knots for vessels of all sizes. All boat harbours and marinas in Queensland also have a six knot speed limit under the Schedule. The Marina Megafauna Management Plan presented as Appendix P2 of the EIS described mitigation measures proposed to reduce boat strike to a low level impact during construction and operation. Measures include:

- vessel transit lanes during operation and restricted barge movements during construction
- enforcement of six knot speed limits in the marina
- marina boat owners and users education program on best boating practice
- information brochures in marine interpretive centre
- signage in the marina and entrance channel.

The proponent has identified that it will where possible enforce the speed limit through a three strike policy. Vessels observed to be exceeding the speed limit on three

occasions will have their berthing privilege removed and the vessel operator will be asked to leave the marina. A register of offenders will be maintained.

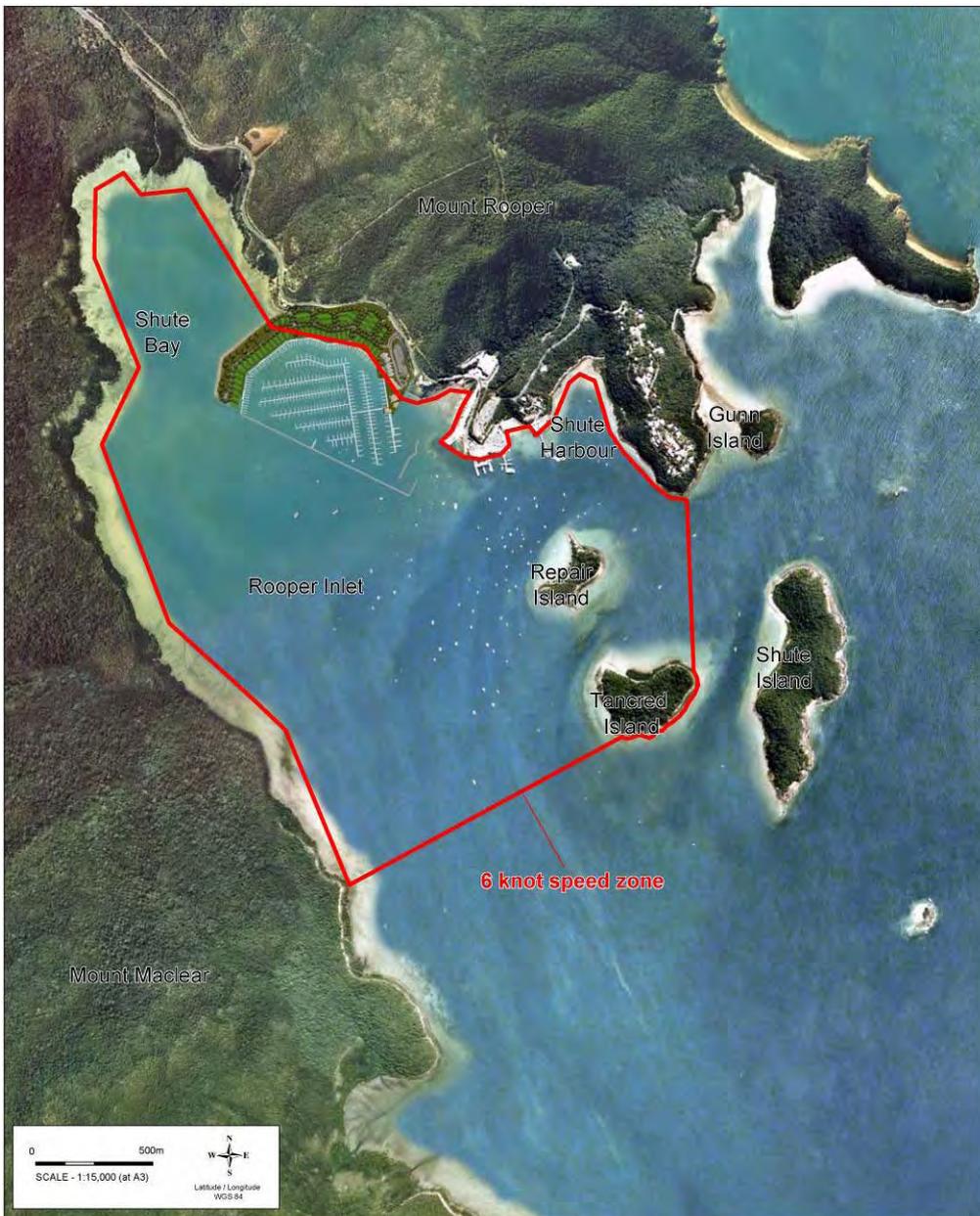


Figure 6.4 Shute Bay six knot speed zone

Swing moorings

As part of the construction of the marina, the proponent would remove 32 swing moorings at their own expense as indicated in plans provided with additional information (Appendix GS13). These swing moorings are located:

- in the proposed marina basin, or
- inside or in proximity to the proposed access channel.

The swing moorings to be removed are under the control of the Regional Harbour Master who has indicated there is capacity in the bay to accommodate the relocation of the moorings which will be undertaken with proponent funding. Replacement of the moorings would be undertaken with moorings that prevent the anchor chain damage to the seabed and seagrass that currently occurs. The timing and method of removal and replacement will be determined subsequent to this evaluation report.

The proponent has set aside 40 berths in the marina for swing mooring conversions, meaning those who previously leased the removed mooring will have an opportunity to purchase a berth at the market rate.

6.2.4. Coordinator-General's conclusions

Marine access to Shute Harbour is considered to be integral to the proposed development. Apart from allowing safe access for visitors, the marine precinct would provide a focal point for the development and provide opportunities for further marine-based tourism services, such as tours and charters. MSQ has advised that up to 30 large (20 metres plus) vessel movements per day occur from the barge and ferry terminals at Shute Harbour. Accordingly, the safety of marina, ferry, barge and boat ramp users is a concern for my determination.

I note MSQ requires consultation with the Regional Harbour Master during the preparation of marine and construction traffic plans, signage, cyclone plans, construction management plans and oil spill response plans, and in respect to swing moorings and mooring areas for recreational boaties.

I acknowledge the proponent's commitment to a new four lane public boat ramp and trailer parking to provide car and boat trailer parking to alleviate parking on Shute Harbour Road. The proponent has committed to provide \$2.5 million towards these works.

To ensure the safety of marine traffic associated with the proposed development, the proponent must provide and install an effective vessel traffic separation scheme along the whole of the north east channel from Low Rock to the marina entrance channel including associated navigational aids to the satisfaction of the Regional Harbour Master (Mackay) and Maritime Safety Queensland. Maintenance of the navigational aids is the responsibility of Maritime Safety Queensland.

I expect that the site is to be developed generally in accordance with the plans provided in Appendix GS13 of the supplementary information. I also expect that all proposed works are fit for purpose and are maintained throughout the life cycle of the development, including the artificial headland structures and dredged areas.

I require the following outcomes as part of the proposed development:

- the Regional Harbour Master is consulted in relation to the maritime-related sections of any development plans, prior to the implementation of those plans
- consultation with the Regional Harbour Master and MSQ to finalise unresolved maritime matters including:
 - timing of replacement swing mooring and number to be relocated
 - location and management of proposed 'mooring area for recreational boaties'

- marine traffic management approaching and departing the marina
 - the location of the marine access channel does not interfere with the safe operation of the ferry and barge terminals and meets MSQ safety requirements
 - installation of an effective vessel traffic separation scheme along the north east channel including associated navigational aids to the satisfaction of the Regional Harbour Master. Maintenance of the navigational aids is the responsibility of MSQ.
 - minimisation of risk to navigational safety resulting from the construction and operation of the proposed development. In particular, ensure all necessary maritime safety infrastructure and supporting systems (particularly aids to navigation) are established and maintained throughout the lifecycle of the development
 - further work is undertaken to confirm, understand and account for any impacts of this project on marine traffic. This work will be undertaken through completion of EMPs required for this project (Refer Section 7: Matters of National Environmental Significance). These EMPs will be updated as required to ensure their currency
- I have stated conditions in this report to ensure the safety of marine traffic associated with the proposed development. (Appendix 1, Conditions 61-62).

7. Matters of national environmental significance

7.1. Project assessment and approvals

On 17 July 2006, the proponent referred the project to the Commonwealth Environment Minister (referral number 2006/2939) for a determination as to whether the project would constitute a ‘controlled action’¹⁴ with respect to potential impacts on ‘matters of national environmental significance’ (MNES) under section 75 of the EPBC Act.

The EPBC Act establishes an Australian Government process for assessing environmental impacts and approving proposed actions that are likely to have a significant impact on MNES.

On 27 July 2006, the Commonwealth Environment Minister determined that the project is a ‘controlled action’ under the EPBC Act. The relevant controlling provisions under the EPBC Act are:

- sections 12 and 15A world heritage properties
- sections 18 and 18A listed threatened species and ecological communities
- sections 20 and 20A listed migratory species
- sections 24 and 24A Commonwealth marine areas.

The Australian Government has accredited the State of Queensland’s EIS process, conducted under the SDPWO Act, under a bilateral agreement between the Australian and Queensland governments. Under the agreement (made under section 45 of the EPBC Act), if a controlled action is a coordinated project for which an EIS is required under the SDPWO Act, then the project does not require assessment under Part 8 of the EPBC Act. The agreement enables the EIS to meet the impact assessment requirements of both Commonwealth and Queensland legislation.

The project as described in the Initial Advice Statement (IAS) (July 2006) was the subject of an environmental impact statement (EIS) released for public comment on 1 November 2008. In response to submissions on that EIS, the proponent revised the scale of the project, reducing the height and number of buildings as well as reducing the number of proposed marina berths from 669 to 395. On 9 February 2009, the Coordinator-General sought additional information on this revised project. This information was provided in the form of a supplementary EIS (SEIS), which was released for public and advisory agency comment on 16 March 2013. This revised project is the subject of my evaluation.

Under Part 4 of the SDPWO Act and section 36 of the State Development and Public Works Organisation Regulation 2010 (SDPWO Regulation), the Coordinator-General must ensure the assessment report evaluates all relevant impacts that the action has, will have, or is likely to have, and provide enough information about the action and its

¹⁴ For a definition of ‘controlled action’, refer to the Glossary on page 200 of this report.

relevant impacts to allow the Commonwealth Environment Minister to make an informed decision whether or not to approve the action under the EPBC Act.

This section of the report addresses the requirements of the TOR and Queensland Government's assessment as specified by Schedule 1 of the bilateral agreement and Part 13 of the SDPWO Regulation.

7.2. Description of the proposed action

The proposed marina development is located in the WRC area; 10 km east of Airlie Beach at Shute Bay (refer Figure 7.1). The area under lease to the proponent is intersected by Shute Harbour Road, with the entire development (project site) located south of the road. The project site for the marina covers 25.2 ha and the access channel covers 3.1 ha.

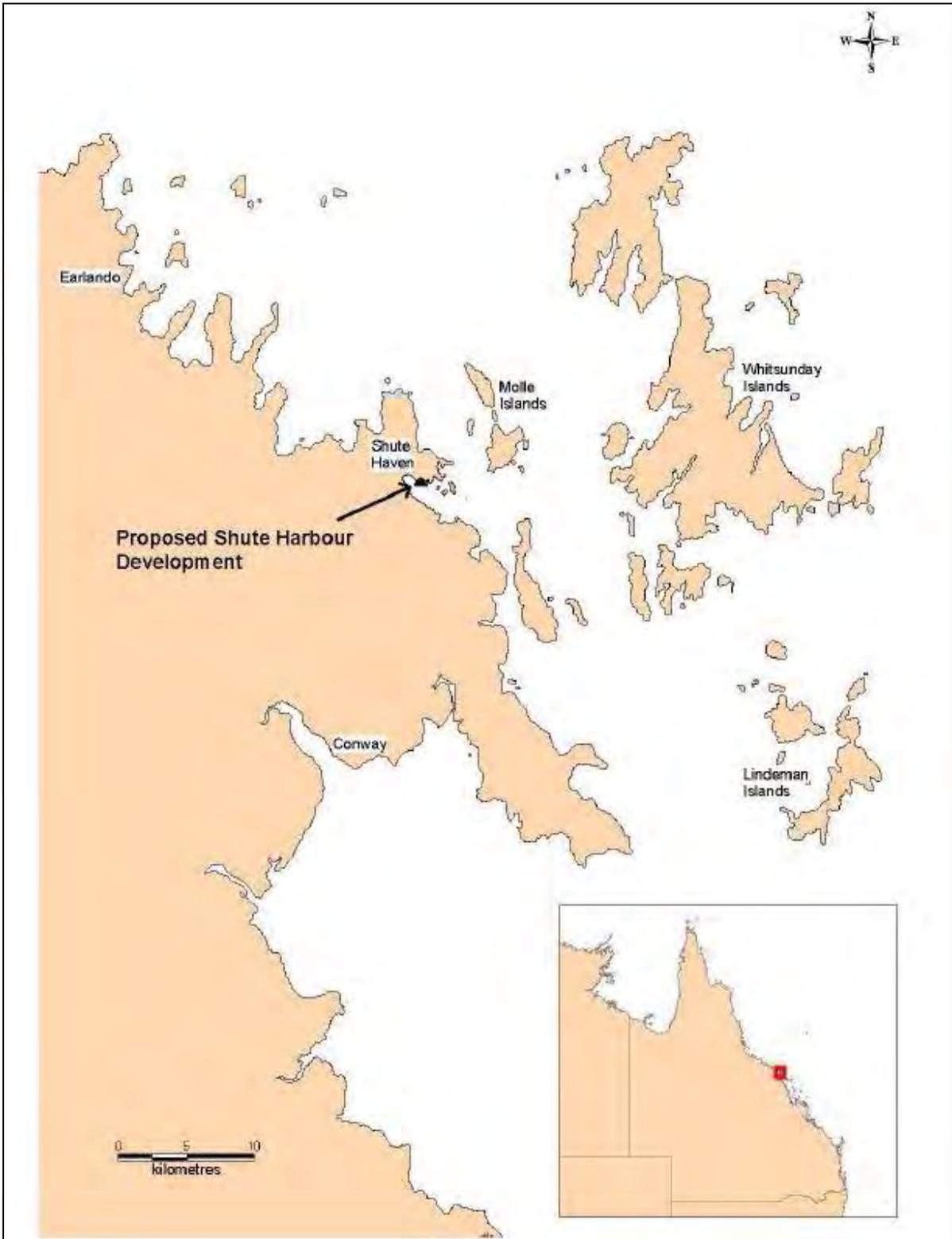


Figure 7.1 Site location in Whitsunday Region

The marina will support 395 berths by floating pontoons and will provide a fuel dock and sewage pump-out facility (refer Figure 7.2).

Proposed components of the marina development include the following:

Matters of national environmental significance

Shute Harbour Marina project:

Coordinator-General's evaluation report on the environmental impact statement

- retail (595 m² Gross Floor Area)
- sailing club
- charter base
- hotel accommodation (109 suites)
- resort accommodation (49 lots and 70 apartments)
- Indigenous cultural centre
- marine education centre
- community cyclone shelter
- emergency services and sea rescue facility
- associated public spaces
- carparking.

Total area of the development is 25.2 ha, including 7.66 ha of reclamation. The remaining approximately 4 ha of land located to the north of Shute Harbour Road will remain undeveloped.

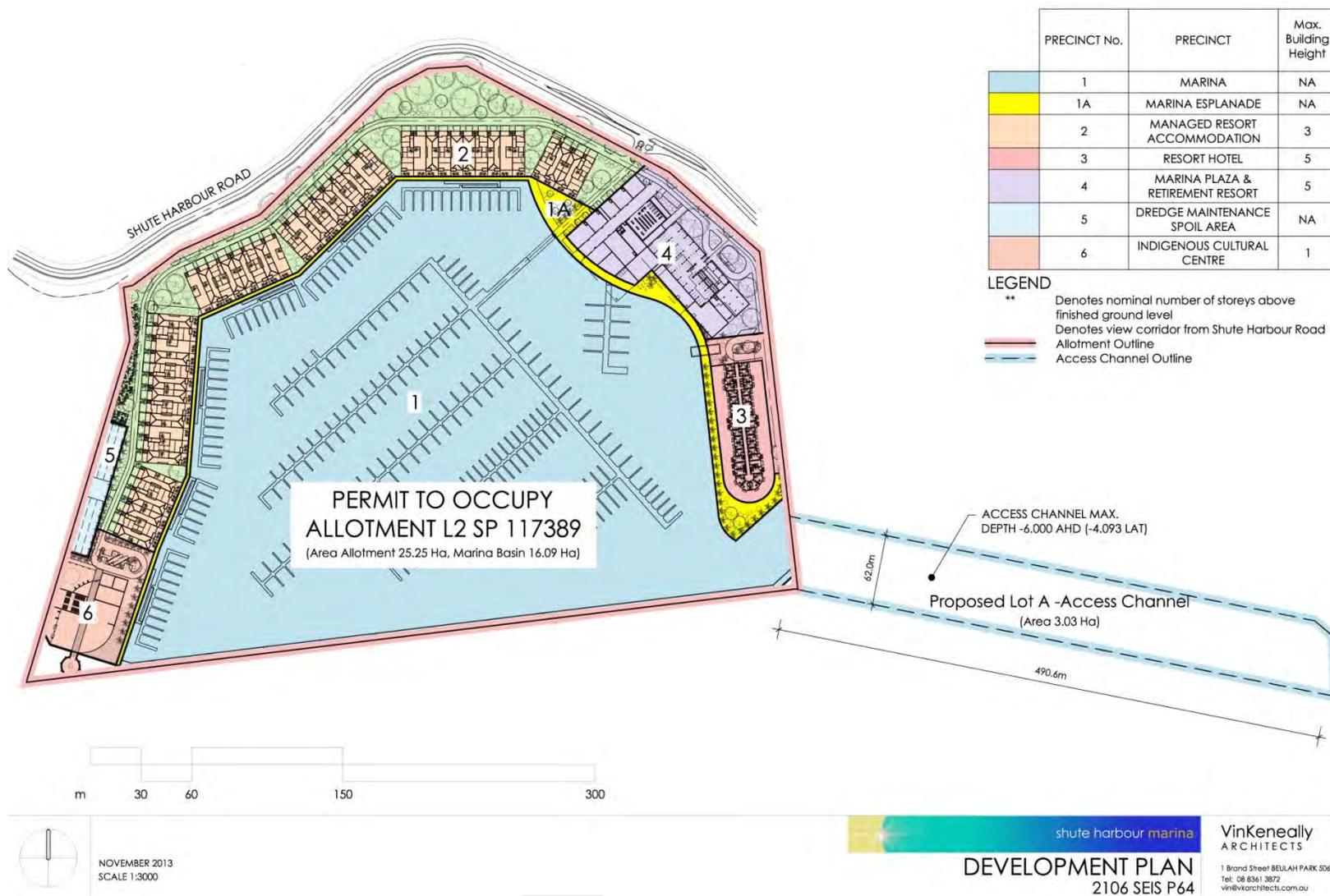


Figure 7.2 Shute Harbour Marine Resort development plan

Matters of national environmental significance

Shute Harbour Marina project:
 Coordinator-General's evaluation report on the environmental impact statement

7.2.2. Construction

Construction for the project is proposed to be carried out in five phases over a 30 month period with the construction of jetty pontoons to continue up to five years beyond construction commencement, depending on the sale of berths. Construction activities involve earthworks, reclaiming tidal and subtidal land, dredging of the marina basin and access channel, and construction of a breakwater. A section of Shute Harbour Road alongside the project site will be upgraded during construction of the project.

- (1) Phase one of construction involves diversion of stormwater via a channel that will be lined with geo-textile and sediment traps for erosion control. Mangroves will be cleared along the northern edge of the site and a fence will be erected along the boundary to Shute Harbour Road to provide dust screening and erosion control. Earthworks will commence in stage one, comprising the reclamation of tidal land with 13 200 m³ of imported clean fill material. The water-side edges of the land reclamation will be lined with 2000 m³ of rock.
- (2) Phase two involves the construction of two headlands (referred in the SEIS as Fingers 1 and 2) to provide access for equipment and materials to construct the main breakwater. Sheet piles will be used in the construction of the breakwaters. Piles will be driven using vibratory or static-hydraulic piling methods, which are known to generate only low levels of underwater noise. Sheet piles will be braced by continuous walers and tied back with steel beams at approximately 16 m centres and anchored in the fill down to rock with driven tie back piles.
- (3) Phase three involves the construction of the main breakwater using steel sheet piling to form circular cells or caissons filled with clean imported fill. Up to 20 000 m³ of fill is proposed to be required. Sheet piles will be positioned using a manufactured circular template and driven by vibratory or hydraulic static piling to a toe depth of approximately -14 m AHD. Residual water in the caissons will be pumped out and discharged into Shute Harbour within a silt curtained area. Precast pile caps will be positioned using a crane.
- (4) The marina basin will be de-watered by pumping water into an enclosure surrounded by silt curtains. The marina basin would then be dry-dredged to -5.4 m AHD. The basin will be over dredged to reduce the requirement of maintenance dredging. Up to 420 000 m³ of material will be excavated from the basin, which will be stockpiled in geotubes for use in further land reclamation for the project. Water drained from the geotubes will be tested during trials. Clear discharge from the geotubes will be piped into the tailwater treatment pond before being discharged into Shute Bay. Any acid sulfate soil (ASS) material will be separated and treated accordingly after excavation and sufficient dewatering.

A sheet pile wall will be installed to the north of the marina basin to retain the landside reclamation. The sheet pile wall will support the pontoons, gangways and berths. The piles will generally be driven to -10 m AHD.

After the marina has been dry-dredged, piles for the marina pontoons, gangways and berths will be installed using a land-based crane-mounted pile driver.

The access channel to the marina will also be dredged during phase four of construction. The proposed maximum dredge volume for the access channel is up to 78 000 m³. The proposed maximum depth of dredging is -6 m AHD.

The reclamation area will be divided into a series of stockpile areas for geotechnical assessment, testing, blending, spreading and compaction. Material used to construct the reclaimed areas and the temporary haul roads and the construction compound will be blended with the excavated materials. The final blended material will be placed in layers and compacted to the geotechnical and civil engineering specifications to AS3798 to finished design levels.

Approximately 600 000 m³ of material is required for reclamation works. Excavation of the marina basin will result in 420 000 m³ of material that will be used for reclamation. The proponent's proposed construction methodology includes material from capital dredging of the access channel as reclamation material. Current estimates of the dredge volume of the access channel is 78 000 m³. Clean imported fill will balance the requirement (approximately 100 000 m³).

- (5) Phase five of construction involves the installation of marina facilities such as, floating pontoons and gangways, navigation and safety lighting and signage, and fuelling infrastructure.

Works on the upgrade of Shute Harbour Road will be carried out in a period of approximately four months at the end of Phase 5. The work will be staged to maintain access to the site and to minimise the impact on traffic. The work requires approximately 26 000 m³ of imported fill.

The operational components of the project will commence construction in response to market demand. The proponent proposes to initially develop the Indigenous Cultural Heritage Centre, emergency services including marina rescue and cyclone shelter, retail and marina services. The apartments and hotel will be developed in line with market conditions and demand expectations.

7.2.3. Operation

The marina basin and the access channel will be over dredged to avoid maintenance dredging for the first ten years of operation. From that time, maintenance dredging is estimated to be required every two to three years.

The annual siltation volume is estimated to be approximately 1900 m³ in the marina basin. The total annual siltation volume for the project is approximately 2500 m³, acknowledging that the annual siltation volume for the access channel is dependent upon final design.

Dredge material from maintenance dredging will be dewatered using a geotube dewatering system. Water filtered from the geotubes will be collected at the base of the management area (refer Figure 7.3) and piped to a bio-retention basin prior to discharge into Shute Bay. When geotubes have been dewatered, the solid material and tubes will be removed from the site. I require the proponent to dispose of dredge material from maintenance dredging to a licensed receiving facility as stated in Appendix 2. Any significant impacts to MNES as a result of disposal of dredge material would be subject to separate assessment and approval under the EPBC Act

7.2.4. Relationships with other developments

The proposed action is situated at Shute Harbour, which is recognised by the State government as a growth area for tourism given its accessibility to the Whitsunday Islands and Great Barrier Reef.

The project site is bordered by the Conway National Park to the north, a marine salvage operation to the west, and the Shute Harbour Ferry Terminal, barge terminal and a motel to the east. Residential developments at Shutehaven, uphill from the ferry and barge terminals, are visible from the project site.

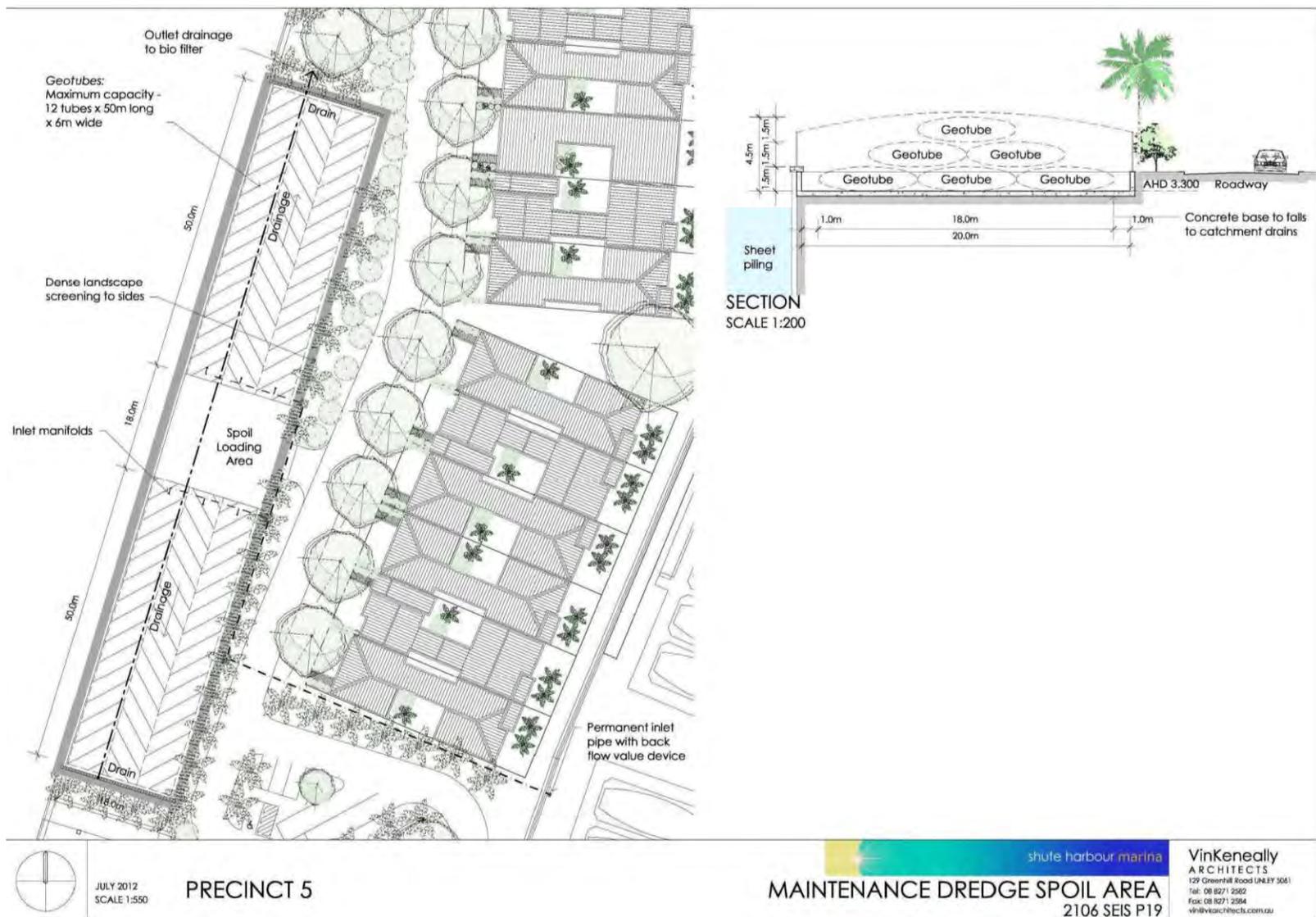


Figure 7.3 Maintenance dredge material area

Matters of national environmental significance

Shute Harbour Marina project:

Coordinator-General's evaluation report on the environmental impact statement

7.3. Threatened species and ecological communities

In deciding whether or not to approve the proposal for the purposes of a subsection of section 18 or section 18A of the EPBC Act, and what conditions to attach to such an approval, the Commonwealth Environment Minister must not act inconsistently with:

- Australia's obligations under:
 - the Biodiversity Convention (CBD)
 - the Apia Convention
 - CITES, or
- a recovery plan or threat abatement plan.

7.3.1. Threat abatement plans

There are four threat abatement plans that list the green turtle, hawksbill turtle, flatback turtle, humpback whale, dugong and the Proserpine Rock-wallaby as species of interest. These plans are summarised in Appendix 7 and include the following:

- *Threat abatement plan for predation by European red fox* (DEWHA 2008)
- *Threat abatement plan for predation by feral cats* (DEWHA 2008)
- *Threat abatement plan for predation, habitat degradation, competition and disease transmission by feral pigs* (2005)
- *Threat abatement plan for the impacts of marine debris on vertebrate marine life* (DEWHA 2009).

7.3.2. Threatened ecological communities

An ecological community is a naturally occurring group of plants, animals and other organisms that are interacting in a unique habitat. Its structure, composition and distribution are determined by environmental factors such as soil type, position in the landscape, altitude, climate and water availability. An ecological community becomes threatened when it is at risk of extinction.

No threatened ecological communities (TEC) were identified through desktop searches or field surveys either on or adjacent to the project site. No TECs will be directly or consequentially impacted by the proposed action.

7.3.3. Threatened flora

Threatened flora are plants that have been assessed as being at risk of extinction. The EPBC Act lists flora considered to be threatened. Their recovery is promoted using conservation advice, recovery plans, and the EPBC Act's assessment and approval provisions.

Table 7.1 lists the species identified through desktop searches as potentially occurring on the project site. Based on the small area of habitat disturbance relative to similar

habitat in the region, and the disturbed nature of this habitat, unacceptable impacts to these species through habitat loss are considered unlikely.

No EPBC Act listed threatened flora were identified at the project site during field surveys, and as such threatened flora species are considered unlikely to be directly or consequentially impacted by the proposed action. *Leucopogon cuspidatus* was listed as Vulnerable at the time of the Controlled Action decision, but is no longer listed under the EPBC Act.

Table 7.1 Threatened flora that may occur in the area

Species	Conservation status
<i>Medicosma obovata</i>	Vulnerable
<i>Omphalea celata</i>	Vulnerable
<i>Ozothamnus eriocephalus</i>	Vulnerable
<i>Phaius australis</i>	Endangered
<i>Streblus pendulinus</i>	Endangered
<i>Taeniophyllum muelleri</i>	Vulnerable

7.3.4. Threatened fauna

Threatened fauna are those species and subspecies of birds, fish, frogs, insects, mammals, molluscs, crustaceans and reptiles which have been assessed as being at risk of extinction. The EPBC Act lists threatened fauna species and promotes their recovery using conservation advice, recovery plans, threat abatement plans and assessment and approval provisions. Some threatened fauna listed under the EPBC Act, including turtles and cetaceans, also form part of the world heritage values of the GBRWHA.

Direct impacts from the project on threatened species identified as occurring in the area includes loss and degradation of habitat. Marine fauna including turtles, dugong and humpback whales are at risk of impacts by increased marine vessel traffic travelling between the project and the Whitsunday Islands. Proserpine rock-wallabies are at risk of impacts by project activities through increased road traffic along Shute Harbour Road. Animals hit by vessels or vehicles may be injured or potentially killed by the collision.

The project will also result in impacts on threatened species occurring in the area including underwater noise impacts and habitat degradation.

Several listed threatened fauna species (refer Table 7.2) were identified through database searches as potentially occurring at the project site but subsequent habitat assessments and site surveys identified that they have a low likelihood of occurrence at the project site.

Table 7.2 Threatened fauna potentially occurring on the project site

Common name	Scientific name	Conservation status
Birds		
Australian painted snipe	<i>Rostratula Australia</i>	Endangered
Kermadec petrel (western)	<i>Pterodroma neglecta neglecta</i>	Vulnerable
Masked owl (northern)	<i>Tyto novaehollandiae kimberli</i>	Vulnerable
Red goshawk	<i>Erythrotriorchis radiates</i>	Vulnerable
Southern giant-petrel	<i>Macronectes giganteus</i>	Endangered
Squatter pigeon	<i>Geophaps scripta scripta</i>	Vulnerable
White-bellied storm-petrel	<i>Fregetta grallaria grallaria</i>	Vulnerable
Mammals		
Bare-rumped sheath-tail bat	<i>Saccolaimus saccolaimus nudicluniatu</i>	Critically endangered
Blue whale	<i>Balaenoptera musculus</i>	Endangered
Greater large-eared horseshoe bat	<i>Rhinolophus philippinensis</i>	Endangered
Water mouse	<i>Xeromys myoides</i>	Vulnerable
Reptiles		
Leatherback turtle	<i>Dermochelys coriacea</i>	Vulnerable
Olive ridley turtle	<i>Lepidochelys olivacea</i>	Endangered
Ornamental snake	<i>Denisonia maculate</i>	Vulnerable
Yakka skink	<i>Egernia rugosa</i>	Vulnerable
Sharks		
Whale shark	<i>Rhincodon typus</i>	Vulnerable

Of the species likely to be significantly impacted by the project, none of the species have approved conservation advice.

Marine turtles

The marine turtle species listed in Table 7.3 are highly likely to be present in Shute Harbour.

Table 7.3 Listed marine turtle species likely to occur at the project site

Common name	Scientific name	Conservation status	Conservation advice	Threat abatement plans ¹
Loggerhead turtle	<i>Caretta caretta</i>	endangered	None	Fox, Pig and Marine Debris
Green turtle	<i>Chelonia mydas</i>	vulnerable	None	Fox and Marine Debris
Hawksbill turtle	<i>Eretmochelys imbricata</i>	vulnerable	None	Pig and Marine Debris
Flatback turtle	<i>Natator depressus</i>	vulnerable	None	Fox, Pig and Marine Debris

¹ Refer Appendix 7 for summaries of threat abatement plans

Loggerhead turtles have a global tropical and subtropical distribution. In Australia, they occur in coral reefs, bays and estuaries in tropical and warm temperate waters off the coast of Queensland, Northern Territory, Western Australia and New South Wales. There are two unique breeding populations of loggerhead turtles in Australia. The eastern Australian population nests on the southern Great Barrier Reef and adjacent mainland coastal areas.

Green turtles occur in seaweed-rich coral reefs and inshore seagrass pastures in tropical and subtropical areas of the Indo-Pacific region. There are seven regional populations of green turtles in Australia.

Hawksbill turtles typically occur in tidal and sub-tidal coral and rocky reef habitats throughout tropical waters, extending into warm temperate areas as far south as northern New South Wales. In Australia, the main feeding area extends along the east coast, including the Great Barrier Reef.

The flatback turtle is endemic to Australia and all known breeding sites of this species occur only in Australia. They feed in the northern coastal regions of Australia, extending as far south as the Tropic of Capricorn. Flatback turtles prefer shallow, soft-bottomed sea bed habitats away from reefs.

Survey results

The EIS identified that all of the above listed marine turtles species are known to utilise Shute Bay and nearby reefs and intertidal habitats as foraging and resting grounds. Shute Bay and adjacent beaches are not known to provide critical habitat including nesting beaches for any of the species.

Seagrass beds in Shute Bay are sparse in cover and consist of *Halophila ovalis* and *Halodule uninervis* species. These are known to be the preferred foraging species for green turtles. Seagrass beds in Shute Bay are not listed in the recovery plan or register of critical habitat as being habitat critical for the survival of marine turtles although this does not limit the habitat from being critical to the survival of these species. Green

turtles are also known to forage on propagules of the *Avicennia marina* mangrove species, which is seasonally present in Shute Bay.

Several green turtles were sighted in Shute Harbour during reconnaissance missions for the EIS in 2008 and subsequent site visits in 2013. DEHP confirmed that turtles are known to frequent Shute Bay.

Project impacts and mitigation measures

The EIS identified that direct disturbance, habitat loss and increased risk of boat strike are the main impacts that the project poses on marine turtles. Construction activities related to the project that may impact on marine turtles includes dredging and pile driving.

Habitat loss

The recovery plan for marine turtles identifies that critical habitat must be protected. No nesting habitat for marine turtles is present in Shute Harbour or in nearby bays and inlets, and therefore will not be impacted by construction or operational activities of the project. Foraging habitat in the form of seagrass is present within Shute Harbour and the dominant seagrass species is *Halodule uninervis*, the preferred foraging species for the green turtle.

Construction of the project will result in the permanent loss of approximately 12.7 ha of seagrass. Up to 9.6 ha of seagrass will be cleared for construction of the marina basin and up to 3.1 ha of seagrass will be cleared for construction of the access channel. While the seagrass to be cleared in Shute Harbour is sparse in cover and is not identified as critical foraging habitat for green turtles, this residual impact to foraging habitat of green turtles is considered likely to be significant, given the regional importance of seagrass beds in Shute Bay and the observed utilisation of the site by turtles.

Pile driving

Piles are proposed to be installed using vibratory or static-hydraulic piling methods, which are known to be low impact pile driving methods that do not cause excessive underwater noise that may injure or disturb marine megafauna, including marine turtles. The proponent has proposed mitigation measures to reduce impacts from underwater noise, including implementing an observation zone to ensure pile driving is halted if marine fauna are observed close to the subject site. In addition to the measures proposed, I require the proponent to manage piling to ensure that EPBC Act listed marine megafauna are not exposed to unacceptably high noise. These measures are consistent with the recovery plan for marine turtles, which states that underwater noise from construction activities should be managed to reduce impacts to marine turtles. I have stated conditions in Appendix 1 relating to this matter.

Boat strike

The recovery plan for marine turtles identifies boat strike as a key threatening process to the survival of the species and suggests that boat speeds should be restricted in areas of important marine turtle habitat. Since 2009 at least nine marine turtle mortalities were identified as a result of boat strike in the Whitsunday region from

Bowen to Ball Bay¹⁵. Within Shute Harbour a total of five deceased marine turtles were identified in the same period with unknown causes of death.

Boat traffic through Shute Harbour is expected to increase as a result of the project. Increased boat traffic is likely to increase the risk of boat strike on marine fauna, including marine turtles.

The proponent has proposed to contribute to the development of a regional approach to manage increasing boating traffic in the Whitsunday area to reduce boat strike incidences. The proponent has also proposed to reduce impacts from boat strike through speed limits and the use of 'vessel transit lanes'. However, I note that a study of voluntary vessel transit lanes and speed limits in Missionary Bay, Hinchinbrook Island showed that these voluntary measures were ineffective at reducing boat strike incidences on marine megafauna.¹⁶

As outlined above, the proponent is required to identify how speed limits and vessel transit lanes will be enforced to ensure compliance and thus reduce the risk of boat strike.

The EIS also identified that the access channel to the marina would be designed to reduce boat strike impacts on marine turtles resting on the seabed in the channel. Small coves outside the access channel could be overdredged, or the sides of the channel could be vertically overdredged to provide depressions for turtles. No evidence is provided to substantiate the effectiveness of this measure and it is therefore not possible to determine that this is an effective mitigation measure. Given the additional dredging required to maintain such measures and potential impacts associated with maintenance, I consider that offsets for the residual impacts would achieve a greater conservation outcome.

Dredging

The marina basin will be completely enclosed and excavated in dry conditions as described in Section 7.2. There is potential for marine turtles to be trapped in the enclosed marina basin prior to dewatering for excavation. I require the proponent to dewater the marina basin in accordance with the Department of Agriculture, Fisheries and Forestry's (DAFF) guidelines for dewatering to reduce impacts to the environment and to ensure enclosure of the basin does not result in entrapment of marine turtles. Potential water quality impacts from dewatering the marina are discussed further below.

Capital and maintenance dredging for the access channel and maintenance dredging of the marina basin will be cutter suction dredged.

Potential impacts on marine turtles associated with capital and maintenance dredging include direct impacts such as injury from interaction with dredge equipment and impacts from underwater noise. Indirect impacts from dredging include the reduction of potential foraging resources through dredge plumes degrading the quality and quantity

¹⁵ Department of Environment and Heritage Protection. StrandNet. Available <https://www.derm.qld.gov.au/strandnet/application> [accessed 24 September 2013].

¹⁶ Groom, RA 2003. The efficacy of the voluntary vessel transit lanes in Missionary Bay, Hinchinbrook Island for dugong conservation management. James Cook University, Queensland.

of seagrass beds. The seagrass beds present in Shute Harbour are sparsely covered however they may be of regional importance to marine turtles. Dredge plumes impacts on water quality and seagrass are discussed further below.

The proponent has proposed to employ a fauna spotter who will monitor for cetaceans and marine turtles during maintenance dredging. Conditions are stated in Appendix 1 of this report requiring the proponent to suspend dredging, if cetaceans, dugongs and/or turtles are observed within 500 metres (the observation distance) of the dredging activity. Dredging must stop and not recommence until the cetaceans, dugongs and/or turtles are observed to travel beyond the observation distance or a 30 minute period has passed since any cetacean, dugong or turtle was last seen by an appropriately qualified person within the observation distance of the dredging work site.

Water quality

Increased suspended sediment concentrations from dredge plumes and degraded water quality in Shute Bay may cause the consequential loss of marine turtle foraging habitat.

Increased nutrient concentrations in Shute Bay from the release of sewage from moored vessels may result in increased epiphytic algal growth on seagrass, thus reducing the quality of seagrass communities and potential foraging habitat for marine turtles.

Water quality in Shute Harbour may be degraded during construction and operation of the project, including dewatering of the marina basin prior to excavation. Suspended sediment concentrations may increase during construction from dredge plumes, erosion and sediment runoff. During operations, water quality may be impacted by maintenance dredging, erosion and sediment runoff, chemical spills and sewage discharge.

Chemical spills from car parks, re-fuelling and hull-cleaning activities will be minimised through banning hull-cleaning operations on the project site and installing oil separators in car parking areas. Oil spill kits will be available at all times aboard tugs and barges to manage oil spill incidents. Conditions relating to spill prevention and response measures have been stated in the report.

Suspended sediment concentrations will be minimised through installing silt curtains around dredging activities and around construction works, and installing silt fences, catch drains and sediment control devices at existing stormwater drains.

Impacts from sewage discharge will be minimised through providing sullage pump-out facilities at the marina. Boat operators will be prohibited from using their onboard toilets and showers and encouraged to use the toilet and shower amenities provided at the marina.

Humpback whale (*Megaptera novaeangliae*)—vulnerable

The humpback whale is listed as 'vulnerable' and 'migratory' under the EPBC Act. It is a moderately large baleen whale and is found in oceans worldwide. There is no approved conservation advice available for this species. One threat abatement plan (marine debris) lists the humpback whale as a species of interest (refer Appendix 7 for summary of plan).

The Australian humpback whales feed in the Antarctic waters and migrate up the east and west coasts of Australia to breed in the warmer sub-tropical waters. The east coast population breeds in the Whitsunday region between June to August and migrate back to the southern feeding grounds between September to November.

Humpback whales feed almost exclusively on krill, although it has been recorded that they feed on small fish and plankton in warmer waters.

The EIS identified that the Whitsunday Islands and passage are key breeding and resting grounds for humpback whales. They are known to occur in the region during the winter migration to and from Antarctica, resting in the Whitsundays.

Shute Bay and the adjacent Molle Channel are considered to be too shallow for humpback whales, therefore the species has a low likelihood of occurring in the project area.

Project impacts and mitigation measures

Boat strike

The project will result in an additional 395 recreational marine vessels located in Shute Bay and used intermittently to travel to the Whitsunday islands.

Currently there are 25 to 30 large (30 m) vessel movements per day in and out of the barge and ferry terminals at Shute Harbour that travel through the Whitsunday region. In addition the numbers of small boats using the boat ramp and the swing moorings in Shute Bay are significant. Advice from representatives of the terminal operations is that vessel traffic is likely to increase with growth in tourism on the adjacent islands.

There are no recorded injuries or mortalities of humpback whales in the region as a result of boat strike. However, an increase in the number of vessels moving in and out of Shute Harbour into the Whitsundays is likely to increase the risk of collision with humpback whales.

The proponent has proposed to promote best practice environmental management measures for boating to marina users through providing information brochures to marina berth applicants, presentations conducted by DEHP and GBRMPA and emphasis of best practice in monthly newsletters to marina users. In addition the proponent is conditioned to install signage at five locations within the marina, informing readers the surrounding area includes the GBRWHA and habitat for EPBC listed threatened and migratory species, and providing advice about how to minimise impacts on MNES from boating activities (including boat strike), and road use.

The proposed boat speed limits would be only effective within the marina, which would have no impact on humpback whales because Shute Bay is too shallow for them to enter. Similarly a regional approach to managing boat traffic is beyond the jurisdiction of the proponent. The effectiveness of the educational material within the marina is likely to be relatively low; however it represents a low-cost mitigation measure which may have some effectiveness.

Given that the effectiveness of the proposed mitigation measures is likely to be low, significant residual impacts are considered likely to remain and require offsetting in accordance with the EPBC Act Environmental Offsets Policy. Offsets conditioned by

DOTE will be determined using the Policy Statement: Use of Environmental Offsets under the EPBC Act (2012). The statement provides principles for offsetting unavoidable impacts on MNES.

Water quality

The passages outside Shute Harbour where humpback whales migrate are unlikely to experience water quality impacts related to the project, as sedimentation and spill prevention measures will be implemented by the proponent to mitigate impacts to water quality. I require the proponent to manage water releases from Shute Harbour Marina to maintain environmental values. I have stated conditions in Appendix 1 to ensure that impacts to water quality are mitigated.

Underwater noise

Underwater noise generated from piling and dredging activities is not expected to affect humpback whales because their habitat does not extend into Shute Bay.

The proponent has proposed to reduce potential impacts to humpback whales by conducting construction and/or maintenance dredging outside of the humpback whale migration period, i.e., not during July to October, however based on the distance between the project site and humpback whale habitat, and the potential impacts associated with delaying construction and/or maintenance dredging, this measure is not considered necessary to prevent unacceptable impacts on the humpback whale.

Furthermore, the proponent has proposed the following mitigation measures to reduce underwater noise impacts that will also reduce potential impacts to humpback whales:

- Sheet piles are proposed to be installed by vibratory or hydraulic static piling methods, which are known to have a low impact on underwater noise.
- Fauna spotters will monitor for the presence of marine megafauna, including humpback whales, during pile driving activities. If a humpback whale is sighted within 500 m of the pile apparatus, activity will be suspended until the whale has left the 500 m zone or has not been sighted for 30 minutes.
- Fauna spotters will monitor for the presence of marine megafauna, including humpback whales, during dredging activities. If a humpback whale is sighted within 100 m of the dredger, activity will be suspended until the whale has left the 100 m zone or has not been sighted for 30 minutes.
- Pile driving will commence using a soft-start procedure after no marine megafauna are sighted within the area for 30 minutes.

This reports states conditions for underwater noise levels and underwater noise monitoring during pile driving and dredging activities (Appendix 1).

Marine debris

The marine debris TAP identifies that humpback whales are at risk of entanglement, which could lead to restricted mobility and wounding of the animal. The TAP suggests that the most effective way to reduce impacts to marina megafauna from marine debris is to prevent it from entering the marine environment. The proponent has identified

several mitigation measures to reduce these impacts, including providing sufficient rubbish bins on the development site, installing gross pollutant traps in stormwater drains.

Proserpine rock-wallaby (*Petrogale persephone*)—endangered

The Proserpine rock-wallaby is listed as 'endangered' under the EPBC Act. It is one of 11 species of rock-wallaby currently recognised in Queensland. There is currently no approved conservation advice available for this species. It is listed as a species of interest under the feral cats threat abatement plan (refer Appendix 7 for summary of plan).

The species inhabits deciduous vine forest habitat within national parks and state forests adjacent to Proserpine and Airlie Beach including Conway National Park and State Forest and Dryander National Park and State Forest, Gloucester Island National Park and the Clarke Range.

Four main populations of the Proserpine rock-wallaby are separated by unsuitable habitat which prevents gene flow between populations. The species' genetic diversity is relatively low, indicating that the species has had a small distribution and low numbers for some time.

The population of Proserpine rock-wallabies in the Conway National Park that may be affected by the project is identified as an important population according to the national recovery plan for the species. The population that may be affected occurs at Mandalay Point, Mt Lucas and Flametree Creek in the Conway Range.

The Proserpine rock-wallaby forages on fallen leaves, grasses, vines and fungus, and will graze on grasses such as guinea grass (*Panicum maximum*) during dry periods.

The main threats to the survival of the species, as listed in the species' recovery plan, are:

- habitat clearing and fragmentation;
- introduced predators;
- vehicle strike;
- disease; and
- introduced toxic plants.

Survey results

Field surveys for the EIS did not identify any Proserpine rock-wallabies within the project site. However, potential habitat for the species was located within the northern part of the project site. Individuals may use this habitat and potentially approach the project site. The project site does not constitute a wildlife corridor for the species.

Project impacts and mitigation measures

Project-related impacts to the Proserpine rock-wallaby include habitat clearing, vehicle strike from road traffic along Shute Harbour Road, potential spread of disease from domestic cats and dogs, and introduction of exotic and potentially toxic plants.

Habitat clearance

A maximum area of 0.94 ha of terrestrial vegetation is proposed to be cleared at the project site adjacent to Shute Harbour Road. The vegetation to be cleared is mapped as 'essential habitat' for the Proserpine rock-wallaby, but DEHP has advised that it is in fact not suitable habitat for the species.

The proponent has proposed to offset habitat loss through offering the 4.3 hectare parcel of lease land to the north of Shute Harbour Road to NPRSR for incorporation into the Conway National Park. DNRM has advised that this particular parcel of land is not under threat from development and therefore is not a suitable offset. The proponent is required to secure suitable offsets to offset impacts from habitat loss.

Vehicle strike

The recovery plan for the Proserpine rock-wallaby identifies that road strike is one of the key threatening processes to the survival of the species. Shute Harbour Road intersects Proserpine rock-wallaby habitat 4 km to the west of the project site at Flametree Hill. Proserpine rock-wallaby collisions with vehicles travelling on this road are common at this site, particularly during the dry season, from September to November, when wallabies graze on vegetation along road verges.

Most vehicle strikes resulting in death occur where road speeds are 80 km/h or greater and/or where foraging resources are located in close proximity to roads¹⁷. The speed limit at Shute Harbour Road varies between 50 and 100 km/h. The speed limit at Flametree Hill is 100 km/h. Foraging resources for the Proserpine rock-wallaby occur along roadsides, particularly at Flametree Hill.

Estimates of road traffic volumes travelling along Shute Harbour Road from Mandalay Road to Shute Bay last year are 1935 vehicles per day. Projections of road traffic volumes relating to the project indicate approximately 2700 additional vehicle trips per day are expected along Shute Harbour Road to and from the development.

Peak traffic periods are expected to occur from 8 am to 1 pm where total cumulative traffic volumes (including existing traffic) would reach up to 1200 vehicles along Shute Harbour Road. This peak traffic is outside the morning foraging time for Proserpine rock-wallabies and is therefore not expected to result in increased risk of collision.

During morning foraging times (5 am to 8 am) up to 700 vehicles would be travelling on the road. The project would contribute about 30 cars to this volume of traffic. In comparison to the total traffic volume at this time, impacts from the project on the Proserpine rock-wallaby are not expected to be substantial.

An afternoon peak is expected to occur from 3 pm to 6 pm where traffic volumes would reach up to 800 vehicles on the road, of which the project would contribute approximately 160 vehicles (25 per cent increase). This is during evening foraging times for Proserpine rock-wallabies and may result in increased risk of collision.

¹⁷ Johnson PM and Nolan B 1993. The use of wildlife reflectors as a means of reducing kangaroo road deaths—the Proserpine rock-wallaby experience. Report to Australian Nature Conservation Agency, Canberra.

QPWS and DTMR are collaborating to reduce collision risks at Flametree Hill. The agencies have undertaken revegetation of road verges along Shute Harbour Road, which has inhibited grass growth along the roadside resulting in reduced occurrence of wallabies feeding at these sites. WRC has also been managing guinea grass growth along road verges of Shute Harbour Road to minimise impacts on the wallabies.

The proponent has proposed to contribute to these management measures but the DEHP has advised that any additional management of road verges would have a negligible conservation benefit.

Disease

The EIS identifies that the project may result in an increase in domestic cats and dogs in the area, which may carry parasites that are potentially fatal to Proserpine rock-wallabies. This is also identified in the feral cat TAP as a threatening process to the survival of the species.

Domestic cats may carry the blood parasite *Toxoplasmosis gondii*. The parasite is spread through cat faeces and can cause blindness and death in Proserpine rock-wallabies. An individual Proserpine rock-wallaby at Mandalay Point was identified to have the disease, but the extent of its impacts is unknown^{18,19}.

Dogs may carry the parasitic hydatid tapeworm (*Echinococcus granulosus*). Hydatids can be debilitating or fatal to rock-wallabies. The cause of death of an individual wild Proserpine rock-wallaby, found near Proserpine, was found to be hydatid cyst damage to the lungs²⁰.

The impacts from the spread of disease through domestic pets would be most likely to occur if pets and Proserpine rock-wallabies were to occupy the same space. Domestic pets could venture into potential wallaby habitat to the north of Shute Harbour Road, thus increasing the risk to wallabies.

The proponent has advised that it will impose controls on keeping and handling cats and dogs within the project development to reduce potential interactions of these domestic pets and Proserpine rock-wallabies. If domestic pets are either banned from the project site or managed so that they are prevented from entering potential wallaby habitat north of Shute Harbour Road, the potential impacts from disease would effectively be mitigated. It is considered that requiring the proponent to ensure that pets are kept on leashes within the project site will mitigate these potential impacts to the Proserpine rock-wallaby. These mitigation measures are consistent with the species' recovery plan.

Toxic plants

Potential grazing habitat for the rock-wallaby is present on the project site and exotic plants that may be toxic to the Proserpine rock-wallaby may be introduced to the site.

¹⁸ Nolan, BJ 1997. An update of the Proserpine rock-wallaby *Petrogale Persephone* Recovery Plan. *Australian Mammalogy*, 19:309-313.

¹⁹ Schaper, D and B Nolan 2000. Final report on phase two of the recovery plan for the Proserpine rock-wallaby *Petrogale Persephone*. Brisbane: Environmental Protection Agency.

²⁰ Johnson, Pm, R Speare and I Beveridge 1998. Mortality in wild and captive rock-wallabies and nailtail wallabies due to hydatid disease caused by *Echinococcus granulosus*. *Australian Mammalogy*: 20: 419-423.

During the dry season, Proserpine rock-wallabies may enter the project site and graze on potentially toxic household plants. Potentially lethal plants are listed in Table 7.4.

Table 7.4 Plants that are potentially toxic to the Proserpine rock-wallaby

Common name	Scientific name
Angel's trumpet	<i>(Datura metel)</i>
Arum lily	<i>(Zantedeschia aethiopica)</i>
Brazilian nightshade	<i>(Salnum seaforthianum)</i>
Castor oil plant	<i>(Ricinus communis)</i>
Coral bush	<i>(Jatropha podagrica)</i>
Dumb cane	<i>(Dieffenbachia maculata)</i>
Elephant ear	<i>(Colocasia antiquorum)</i>
Fruit salad plant	<i>(Mostere deliciosa)</i>
Mother of millions*	<i>(Kalanchue spp.)</i>
Oleander	<i>(Nerium oleander)</i>
Pepper tree	<i>(Schinus terebinthifolius)</i>
Pink periwinkle	<i>(Catharanthus roseus)</i>
Poinsettia	<i>(Euphorbia pulcherrima)</i>
Rhoeo	<i>(Rhoeo discolor)</i>
Yellow allamanda	<i>(Allamanda cathartica)</i>
Yellow Oleander	<i>(Tevetia peruviana).</i>

* denotes declared weed species

This report has stated a condition requiring the proponent to use native plant species to landscape the development that are unlikely to be toxic to the rock-wallaby. The proponent has committed to install fences, if required, to restrict rock-wallabies from entering the project site. Weeds will be controlled as part of the ongoing site management. When implemented, these measures would effectively mitigate the impacts from toxic plants on Proserpine rock-wallabies. These mitigation measures are consistent with the species' recovery plan.

The Department of National Parks, Recreation, Sport and Racing (DNPRSR) has suggested that the proponent should offset significant residual impacts to Proserpine rock-wallaby from vehicle strike through providing support to the species' recovery plan.

Spectacled flying-fox (*Pteropus conspicillatus*)—vulnerable

The spectacled flying-fox is listed as 'vulnerable' under the EPBC Act. There is currently no approved conservation advice available for this species or any relevant threat abatement plans.

The species occurs in and around the rainforests of north-eastern Queensland, with the largest population known from the Wet Tropics of Queensland World Heritage Area between Townsville and Cooktown.

The species roosts in large aggregations in the exposed branches of canopy trees. Movement of individuals from camps to foraging habitat is not well understood.

The spectacled flying-fox forages on fruit and blossoms, primarily in the canopy vegetation of a wide range of vegetation communities. The species provides an important role in seed dispersal, particularly for isolated and small rainforest fragments. They also serve as pollinators for a variety of tropical rainforest and savannah plants.

The National Recovery Plan for the Spectacled Flying Fox notes the main threats to the survival of the species include:

- habitat loss
- illegal killing and incidental mortality
- harassment by humans
- natural events, e.g. cyclones.

Survey results

Desktop surveys carried out for the EIS identified that the spectacled flying-fox has potential to occur or has suitable habitat at the project site. The species was not identified during field surveys but potential foraging habitat was located within the project site. Mangrove vegetation at the site may be used as a foraging resource for the species. The EIS identified that the species has a low likelihood of occurrence in the project area.

DEHP advised that there are two known spectacled flying-fox camps in the Whitsunday region. One camp is at Mandalay Point and another at Long Island, which are located approximately 2 and 10 km respectively, from the project site.

Project impacts and mitigation measures

Habitat clearing will result in the loss of 2.74 ha of potential foraging habitat for the spectacled flying-fox. According to the spectacled flying-fox recovery plan, habitat loss is considered to be a significant threat. The area to be cleared will not result in large-scale clearing of habitat and is minor compared to the suitable in the broader area. Furthermore, the area to be cleared is considerably disturbed due to existing development of Shute Harbour Road and marine/tourism infrastructure.

The proponent has advised that it will mitigate potential impacts to the spectacled flying-fox by conducting pre-clearance surveys. If any spectacled flying-fox individuals are found during surveys, an appropriately experienced fauna handler will be employed to relocate any spectacled flying-foxes to outside the vegetation clearance area. While it is considered unlikely that spectacled flying-foxes will be encountered at the project site, I require the proponent to undertake pre-disturbance surveys and to relocate all MNES out of the project site prior to clearing as stated in Appendix 1 in this report.

Northern quoll (*Dasyurus hallucatus*)—endangered

The northern quoll is listed as 'endangered' under the EPBC Act. There is currently no approved conservation advice available for this species and it is not listed under any threat abatement plans. It is one of four Australian quoll species. The species is solitary and nocturnal and breeds between June and September.

Northern quolls occur in upland rocky areas and several coastal sites in north and central Queensland. They are also present across the Top End of the Northern Territory and in the Kimberley and Pilbara in Western Australia.

In Queensland, the most abundant populations of northern quolls are found at coastal sites with large boulders. Declining populations are mainly found in lowland and less rugged areas²¹.

The species occupies dens during the day for protection from predators and weather.

The northern quoll diet is adaptable according to season and availability. The species forages opportunistically on small mammals, worms, soft fruit, reptiles, ants, termites, moths and honey.

The national recovery plan for the northern quoll identifies the main threats to the survival of northern quoll populations including:

- cane toads
- habitat degradation
- inappropriate fire regimes
- feral predators
- habitat destruction.

Survey results

A desktop study conducted for the EIS identified that the northern quoll has been recorded in the area and has a high likelihood of occurrence in the project area.

Evidence of the presence of northern quolls was not identified during field surveys at the project site, although suitable foraging and den habitat was found along the slopes and ridges in the project area north of Shute Harbour Road where no development for the project will occur. Suitable habitat for the species is well represented within the Conway National Park adjacent to the project area.

Project impacts and mitigation measures

Construction of the project proposes to clear 0.94 ha of potential habitat for the northern quoll. The area to be cleared is in the low-lying areas of the site south of Shute Harbour Road. The level of disturbance from road traffic is likely to deter the northern quoll from using this habitat therefore habitat loss at this site will not result in an unacceptable impact on the species.

²¹ Woinarskil, JCZ, M Oakwood, J Winter, S Burnett, D Milne, P Foster, H Myles, B Holmes 2008. Surviving the toads: patterns of persistence of the northern quoll *Dasyurus hallucatus* in Queensland. Report submitted to the Natural Heritage Trust Strategic Reserve Program.

The proponent has advised that it will mitigate impacts to the species by conducting pre-clearance surveys prior to commencing construction. An appropriately experienced fauna handler will relocate any individual northern quolls found during the survey to outside the vegetation clearance area. While it is considered unlikely that northern quolls will be encountered at the project site, I require the proponent to undertake pre-disturbance surveys and to relocate all MNES out of the project site prior to clearing as stated in Appendix 1 in this report.

The proponent has proposed to offset impacts from habitat loss through rehabilitating the 4.3 hectare parcel of lease land north of Shute Harbour Road prior to surrendering it to NPRSR for inclusion in the Conway National Park. DNRM has advised that this particular parcel of land is not under threat from development and is therefore not suitable for offsetting purposes. The proponent is required to secure suitable offsets for impacts from habitat loss.

The project will not result in unacceptable impacts to the northern quoll and will be consistent with the species recovery plan through ensuring that potential impacts from habitat clearance are offset.

7.3.5. Cumulative impacts—threatened species and ecological communities

Cumulative impacts on threatened species that may be impacted by the project include habitat loss and degradation and vehicle strike.

Terrestrial ecology

Cumulative impacts from terrestrial habitat loss and degradation as a result of the project are not expected to be significant. Habitat loss is expected to be minimal. The proponent has proposed to reduce impacts during construction on habitat adjacent to the project site by limiting construction activities to within the development footprint.

Increased traffic along Shute Harbour Road as a result of the project will contribute to cumulative road strike risks to the Proserpine rock-wallaby. Mitigation measures administered by State agencies and local government are already in place along the road, however the residual impacts are considered to be significant. The proponent is required to offset residual significant impacts to the Proserpine rock-wallaby.

Marine ecology

Clearing of seagrass in Shute Harbour for construction of the project will contribute to cumulative habitat loss impacts on marine fauna that rely upon seagrass, particularly marine turtles. Habitat loss and degradation associated with the project is expected to be minimal compared with available seagrass meadows in the region, however given the potential for regional significance as foraging habitat the loss and degradation are considered likely to be significant. The proponent has proposed to reduce any impacts to seagrass in Shute Bay by limiting construction activities to within the development footprint and minimising impacts to water quality in Shute Bay. Given the importance of seagrass to listed marine fauna, the residual impacts are considered to be significant and require offsetting.

Increased boat traffic in the Whitsunday region, particularly travelling between Shute Harbour and the Whitsunday Islands as a result of the project will contribute to cumulative boat strike risks to marine fauna in the area including marine turtles and humpback whales. The proponent is not considered likely to be able to effectively mitigate these impacts, and as such is required to provide offsets.

7.4. Listed migratory species

In deciding whether or not to approve the proposal for the purposes of section 20 or 20A of the EPBC Act, and what conditions to attach to such an approval, the Commonwealth Environment Minister must not act inconsistently with Australia's obligations under the following conventions and agreements.

- the Bonn Convention
- CAMBA
- JAMBA
- an international agreement approved under subsection 209(4).

Many animals migrate to Australia and its external territories, or pass through or over Australian waters during their annual migrations. Many migratory species listed under international conventions and agreements that Australia is party to, are protected under the EPBC Act. These species include migratory birds and marine megafauna. Some migratory species also form part of the World Heritage values of the GBRWHA.

The EIS reported that habitat that migratory birds may use habitat that will be cleared for the project. Marine megafauna will be impacted by habitat loss, increased boating activity and underwater noise from pile driving.

Many different species of migratory birds utilise the same habitat areas, and therefore would be similarly impacted if the shared habitat were to be cleared or degraded. Impacts to migratory birds are therefore discussed together below.

7.4.1. Migratory birds

The EIS identified several migratory bird species that may use habitat within the project site. These species inhabit coastal and estuarine habitats and wet forests. No important populations or roosting or nesting habitat for any of the species listed in Table 7.5 were identified in the project area. Note that all of the migratory birds listed below are all also listed as 'marine' and that the Southern giant-petrel is also listed as 'endangered' under the EPBC Act. The Southern giant-petrel also has a recovery plan (refer Appendix 7 for summary of plan).

Table 7.5 Migratory bird species likely to occur in the project area

Common name	Scientific name
Australian cotton pygmy-goose	<i>Nattapus coromandelianus albipennis</i>
Barn swallow	<i>Hirundo rustica</i>
Black-faced monarch	<i>Monarcha melanopsis</i>
Black-naped tern	<i>Sterna sumatrana</i>
Cattle egret	<i>Ardea ibis</i>
Flesh(y)-footed shearwater	<i>Puffinus carneipes</i>
Fork-tailed swift	<i>Apus pacificus</i>
Great egret	<i>Ardea alba</i>
Latham's snipe	<i>Gallinago hardwickii</i>
Little curlew	<i>Numenius minutus</i>
Little tern	<i>Sterna albifrons</i>
Rainbow bee-eater	<i>Merops ornatus</i>
Satin flycatcher	<i>Myiagra cyanoleuca</i>
Southern giant-petrel	<i>Macronectes giganteus</i>
Spectacled monarch	<i>Monarcha trivirgatus</i>
White-bellied sea-eagle	<i>Haliaeetus leucogaster</i>
White-throated needletail	<i>Hirundapus caudacutus</i>

Project impacts and mitigation measures

Habitat loss and degradation

Potential foraging habitat in the project area includes terrestrial habitat located north of Shute Harbour Road where no project development will occur, mangrove habitat in the development footprint and intertidal land which will be dredged or reclaimed.

Construction of the project will result in the loss of 0.94 ha of terrestrial vegetation south of Shute Harbour Road, 1.8 ha of mangrove vegetation and 15.8 ha of intertidal habitat (1.8 ha of mangrove and 14 ha of macroalgae habitat).

The habitat to be cleared is degraded by regular disturbance associated with road traffic and the total area of habitat loss is small, particularly in comparison to the amount of suitable habitat available in Shute Bay and the Whitsunday region generally.

Construction and operation of the project may also result in degradation of potential migratory bird habitat adjacent to the project area. Less than 5 ha of potential habitat to the north of Shute Harbour Road are at risk of degradation from lighting and noise impacts from the project.

The proponent has stated in the EIS that it is desirable to conduct construction works between May and August, when most migratory birds will be absent from the area. However, this is unlikely therefore disturbance impacts from construction are likely to occur. The proponent has proposed to conduct pre-clearance surveys and to employ an appropriately experienced fauna handler to relocate any migratory birds identified during pre-clearance surveys to outside the vegetation clearance zone. Given the

existing levels of disturbance in the project area it is considered unlikely that substantial numbers of migratory birds will be present in Shute Harbour during construction.

The proponent has also proposed to minimise adverse impacts through ensuring that project construction activities are restricted to the development footprint.

7.4.2. Migratory marine fauna

The EIS identified that dugong (*Dugong dugon*), marine turtles, cetaceans and estuarine crocodiles (*Crocodylus porosus*) are likely to occur within the project site and surrounding areas. Marine turtles are discussed above under Section 7.3.4 Threatened fauna. Cetaceans that may occur in the Whitsunday area include humpback whales, Australian snubfin dolphin and the Indo-Pacific humpback dolphin.

Dugong

The dugong is listed as a migratory species under the EPBC Act and as a vulnerable species by the IUCN (2010). The Australian population of dugong is found in north Australian waters from Shark Bay, Western Australia to Moreton Bay, Queensland. The species is listed as part of the outstanding universal value of the Great Barrier Reef World Heritage Area (GBRWHA). The species does not have any relevant conservation advice or recovery plans but is listed as a species of concern under the marine debris threat abatement plan (refer to Appendix 7 for summary of plan).

Aggregations of dugongs tend to occur and migrate between wide, shallow protected bays, mangrove channels and on the lee side of large inshore islands to forage on seagrass. Dugongs calve in shallow waters, such as on tidal sandbanks and estuaries.

The most recent dugong population survey conducted in the Great Barrier Reef, carried out in 1999, found 353 dugongs in the Whitsunday region²². Since that time Queensland has experienced major flooding events and increased development and marine vessel movements along the coastline, each with unknown effects on the dugong population in the Great Barrier Reef and within the Whitsunday region in particular. Dugongs are expected to utilise habitat in Shute Bay that may be impacted by the project.

The EIS reported that dugongs have a high probability of occurrence at the project site, although the site does not provide regionally important habitat for the species.

Seagrass beds at the site are sparsely covered and are not recognised as important foraging habitat for dugong although could be considered to be important given it is within an area of a declining dugong population and where seagrass meadows have in the recent past been adversely affected by cyclones and flooding. The project site may have indirect significance to the dugong given its location between two key habitat areas Repulse Bay and Edgumbe Bay which are recognised dugong protection areas.

²² Marsh H and I Lawler 2001. Dugong distribution and abundance in the southern Great Barrier Reef Marine Park and Hervey Bay: Results of an aerial survey in October-December 1999. GBRMPA, Australia.

Project impacts and mitigation measures

Boat strike

Dugong travelling between Repulse Bay and Edgecumbe Bay dugong protection areas may be subject to boating disturbance, including boat strike, from marine vessel traffic related to the project. The project will result in an additional 395 recreational marine vessels travelling to and from the marina to the Whitsunday islands, which will increase the risk of boat strike incidences to dugong in the area.

The proponent has proposed to contribute to the development of a regional approach to manage increasing boating traffic in the Whitsunday area. Furthermore, the proponent intends to collaborate with GBRMPA and MSQ to implement 'go slow zones' in Shute Bay and adjoining waters, that is consistent with the existing six knot speed limit for Shute Bay. The proponent also intends to enforce speed limits within Shute Bay by implementing a three strike policy, as described previously. The proponent has also proposed to implement an education program to encourage the adoption of boating best practice.

As described above, the effectiveness of these mitigation measures would be most effective within the marina, where the proponent would be able to enforce the speed limit. Similarly a regional approach to managing boat traffic is beyond the jurisdiction of the proponent. The effectiveness of the educational material within the marina is likely to be relatively low; however it represents a low-cost mitigation measure which may have some effectiveness.

Marine debris

Marine debris associated with marina operations including ropes, etc., may injure or cause fatalities to dugongs through entanglement or ingestion.

The proponent has proposed to manage waste at the marina through the provision of bins and a litter collection program. Litter suspended in stormwater will be prevented from entering the marina through the use of gross pollutant traps.

Provided these mitigation measures are implemented effectively, potential impacts from marine debris to dugongs are unlikely. To ensure this happens, I require stormwater to be managed in accordance with relevant guidelines as stated in Appendix 1.

Underwater noise

Dugongs are susceptible to impacts from underwater noise although it is not identified as a threat to the species in the EPBC Species Profile and Threats (SPRAT) database.

Potential sources of underwater noise from the project include pile driving and dredging activities. The proponent has identified that it will use low-impact pile driving methods including vibratory or hydraulic piling, which do not generate high levels of underwater noise. Additionally, wet dredging of the access channel will be conducted using a cutter suction dredge, which also does not generate high levels of underwater noise.

The proponent has proposed to implement mitigation measures to reduce impacts from underwater noise on marine megafauna, as outlined previously.

In light of the equipment to be used and the mitigation measures to be implemented, I consider potential underwater noise impacts on dugong to not be unacceptable.

Habitat loss

Construction of the marina basin will result in the clearance of 9.6 ha of seagrass for the marina basin and up to 3.1 ha of seagrass for the access channel. Dugongs are known to prefer to forage on *Halodule uninervis*, which is the dominant seagrass species in Shute Bay. Seagrass cover is sparse in the Bay and the area is not known to be favoured by dugong for foraging, however it may provide an important resource for dugongs travelling between seagrass meadows to the north and south of Shute Harbour in Repulse Bay and Edgecumbe Bay dugong protection areas.

It is considered that the residual impact of seagrass is a significant impact to the dugong which requires offsetting. The proponent has proposed to support seagrass research and management programs as an offset for clearing seagrass, including supporting catchment management groups to improve water quality in catchments near Shute Bay and therefore improve conditions for seagrass growth and rehabilitation. I require the proponent to develop an offset plan in accordance with the EPBC Act environmental offset policy to adequately compensate for the residual significant impacts as stated in Appendix 1 in this report.

Cetaceans

Inshore dolphins that may occur in the area of the project site include the Australian snubfin dolphin (*Orcaella heinsohni*) and the Indo-Pacific humpback dolphin (*Sousa chinensis*).

In 2005, the Australian snubfin dolphin was described as a new species; separate from the Irrawaddy dolphin populations in Asia. The Australian population is thought to be continuous with the Papua New Guinean population, but separate from populations in Asia. The species inhabits riverine, estuarine and coastal waters in Western Australia, Northern Territory and Queensland.

The Indo-Pacific humpback dolphin has been recorded in tropical and subtropical coastal waters in Australia. Large populations occur in Moreton Bay. The species primary habitat has been described as the shallow (<20 m) turbid waters near the mangrove and mudbank areas of estuaries, including the tidal reaches of rivers.

Both species have a low probability of occurrence in and near the project site, given their habitat preferences. However, the project may result in boat strike and underwater noise impacts on the species.

The effectiveness of mitigation measures proposed to reduce boat strike incidences and underwater noise impacts are discussed above.

Impacts from boat strike as a result of the project are unlikely to be unacceptable, given that marina users are most likely to travel between the marina and the Whitsunday islands, and are not anticipated to travel into estuarine habitats where dolphins may occur. Impacts from underwater noise generated during pile driving and dredging activities will be managed to an acceptable level and therefore are not considered to be unacceptable.

Estuarine crocodile

The estuarine crocodile (also known as the salt-water crocodile) is the largest species of crocodile and the largest living reptile on the planet. The species is found in Australian coastal waters, estuaries, freshwater sections of lakes, inland swamps and marshes. The species' distribution ranges from coastal areas of King Sound (near Broome) in Western Australia to Rockhampton in Queensland.

In Queensland, the species is usually restricted to coastal waterways and floodplain wetlands. Preferred nesting habitat includes elevated isolated freshwater swamps that are not influenced by tidal movements. Floating rafts of vegetation provide important nesting habitat.

The EIS reported that estuarine crocodiles have a high probability of occurrence at the project site, although the site does not provide regionally important habitat for the species.

The project site is located within the distribution range of the estuarine crocodile but does not comprise or adjoin any preferred or important habitat for the species. It is also not known to support any breeding sites for the species. Crocodiles have occasionally been sighted in the vicinity of the Laguna Quays development, located south of the Whitsundays in Repulse Bay.

Crocodiles travelling between estuaries in the region are at risk of boat strike as a result of the project. The proponent has proposed to reduce boat strike incidences as described above. Project impacts on the species are unlikely to be unacceptable, given there is no important crocodile habitat near the project area.

7.4.3. Cumulative impacts—Migratory species

Cumulative impacts on migratory species that may be impacted by the project include habitat loss and degradation and vehicle strike.

Migratory birds

The project will result in the loss of a small area of potential habitat for terrestrial migratory birds. The habitat to be cleared does not represent important habitat for any migratory bird species that area likely to occur in the area, therefore the impacts are considered to be not unacceptable.

The project will not have any significant cumulative impacts on migratory shorebirds.

Marine fauna

Cumulative impacts to migratory marine fauna are the same as for the listed threatened species (refer Section 7.3.5 above).

Loss of seagrass in Shute Harbour as a result of the project will contribute to cumulative impacts from habitat loss on dugongs. The proponent has proposed to minimise impacts to seagrass in Shute Bay, but the residual impacts are considered to be significant and require offsetting.

Migratory marine fauna are also at risk of cumulative impacts from increased boating activity in the Whitsunday region as a result of the project. The proponent has proposed to implement several mitigation measures, as discussed above. These

impacts are not expected to be manageable and are therefore required to be offset. Notwithstanding this, they are not considered to be unacceptable.

7.5. Great Barrier Reef World Heritage property

In deciding whether or not to approve the proposal for the purposes of section 12 or 15A of the EPBC Act, and what conditions to attach to such an approval, the Commonwealth Environment Minister must not act inconsistently with:

- Australia's obligations under the World Heritage Convention
- The Australian World Heritage management principles
- a plan that has been prepared for the management of a declared World Heritage property under section 316 or as described in section 321.

Note, however, that there is no plan for the management of a declared World Heritage property to be considered for this approval.

The Great Barrier Reef is the world's most extensive reef system, covering 348 000 km². The entire ecosystem was listed as a World Heritage property in 1981 and includes waters up to the low water mark on the mainland.

The Great Barrier Reef extends over 2000 km along the north-eastern coast of Australia. The Great Barrier Reef coastal zone covers a vast area that is acknowledged by UNESCO as a mixed-use area and was listed as a World Heritage Area on that basis. In addition to sustaining a population of around one million people, it also supports industries such as tourism, commercial fishing, mining and agriculture. These industries are vital to the ongoing viability and strength of the Queensland economy; collectively contributing more than \$40 billion a year.

The ecological integrity of the Great Barrier Reef is enhanced by the unparalleled size and good state of conservation across the property. Natural occurrences, like extreme weather events, and human uses of the reef add pressure to the property.

The *Great Barrier Reef Outlook Report* prepared by the Great Barrier Reef Marine Park Authority (GBRMPA) in 2009 focuses on four key factors that were either currently affecting the property, or were projected to affect the property—climate change, coastal development, catchment runoff and direct use. GBRMPA further identifies over 40 emerging threats to the health of the GBR.

The 2012 Reactive Monitoring Mission by the World Heritage Centre and the International Union for the Conservation of Nature also identified that the current and potential threats to the long-term conservation of the GBRWHA are climate change, catchment runoff, coastal development, ports and shipping and direct extractive use.

At a time when the health of reef systems worldwide is declining, the Great Barrier Reef remains one of the best managed in the world. The recently released Great Barrier Reef Strategic Assessment reports on the coastal and marine environments of the reef indicate that the Queensland and Australian Governments will work closely to improve the state of the GBRWHA. The Minister will take into consideration the

outcomes of the strategic assessments when making his final decision on whether to approve the proposed action (project).

The Great Barrier Reef is one of only a small number of World Heritage properties worldwide that has been adopted for all four natural criteria, which follow, and meet the conditions of integrity and authenticity:

- Criterion VII—contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance
- Criterion 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
- Criterion IX—be outstanding examples representing significant on-going ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals
- Criterion 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.

The statement of outstanding universal values (OUV) for the GBRWHA is included as Appendix 6 of this report.

In Australia, an action that has, will have, or is likely to have a significant impact on the world heritage values of a declared World Heritage property requires approval under the EPBC Act. The *Matters of National Environmental Significance: Significant Impact Guidelines*²³ consider an action is likely to have a significant impact on the OUV of a declared World Heritage property if there is a real chance or possibility that it will cause one or more of the values to be lost; degraded or damaged; or notably altered, modified, obscured or diminished.

The potential impacts of the project on OUV include impacts to the marine environment including:

- land reclamation and marina construction
- impacts to species and their habitats
- changes to the visual amenity of Shute Bay
- impacts to water quality.

The following discussion describes the potential impacts on each of the World Heritage Area listing criteria.

7.5.1. Criterion VII

Contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance

The Great Barrier Reef is of superlative natural beauty above and below the water, and provides some of the most spectacular scenery on earth. It is one of a few living

²³ Department of Sustainability, Environment, Water, Population and Communities 2009

structures visible from space, appearing as a complex string of reef structures along Australia's north-east coast.

The OUV relating to this criterion includes visual aesthetics of landscape and seascapes, naturalness and the abundance and diversity of marine fauna and colonies of seabirds. The statement of OUV is included as Appendix 6 of this report.

Shute Bay is characterised by contrasting landscapes of natural coastal environments and coastal development including marine and tourism-related infrastructure and residential housing.

Shute Bay is a large, shallow inlet surrounded by predominantly intact coastal habitat. Built infrastructure in the area includes Shute Harbour Road, which runs along the northern edge of the bay to Shutehaven at the entrance to Shute Bay. Coastal development is limited along Shute Harbour Road and includes a marine salvage operation, motel, barge and ferry terminals and residential buildings.

The project is proposed to be located between an existing marine salvage operation to the west and a barge terminal at Shutehaven to the east (refer Figure 7.4). Development for the project will be concentrated along the shoreline at the foot of Shutehaven, having only minor disturbance to the natural areas of Conway National Park to the north and west of the project site.

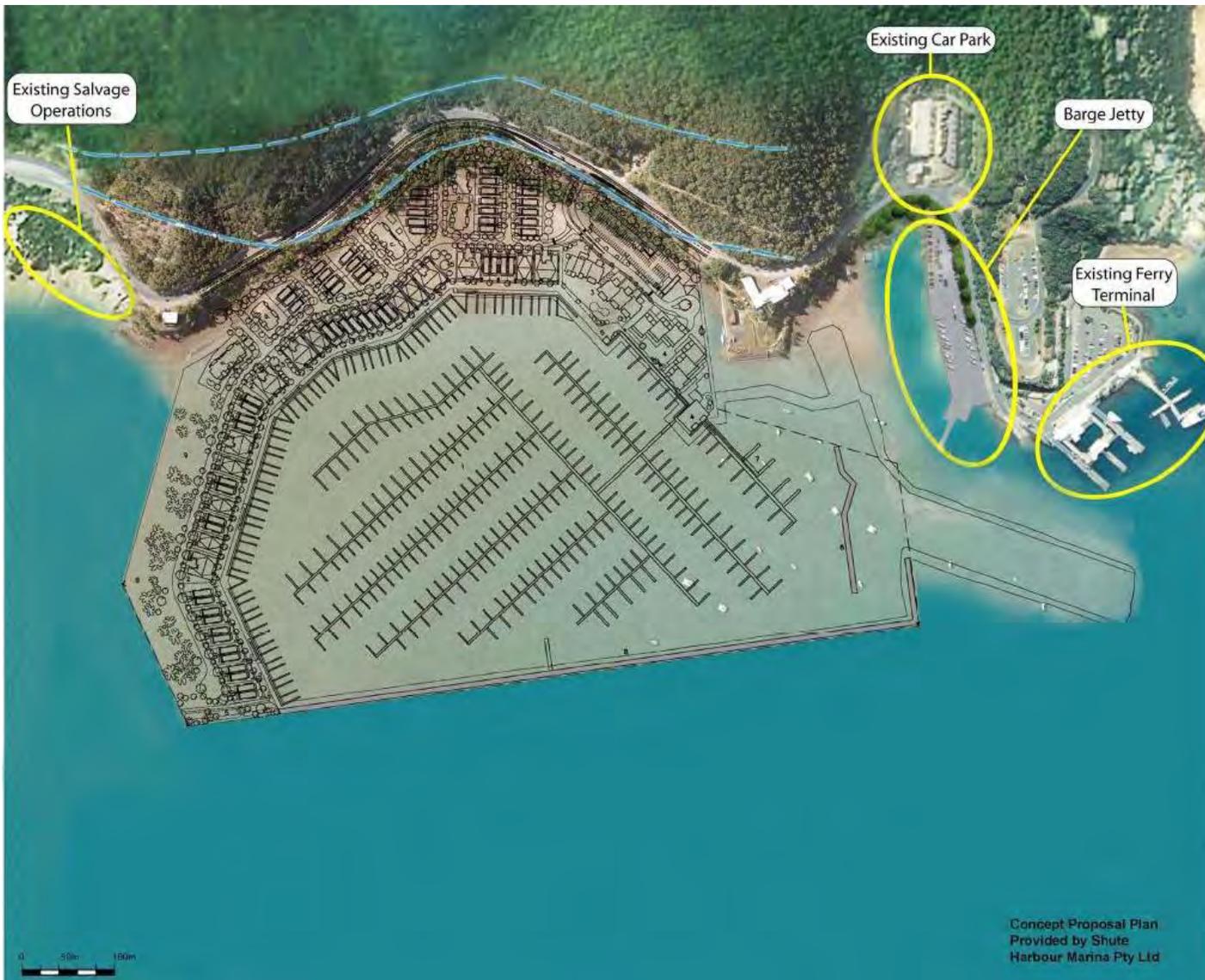


Figure 7.4 Shute Harbour Marina and surrounding developments

Matters of national environmental significance
Shute Harbour Marina project:
Coordinator-General's evaluation report on the environmental impact statement

Visual amenity

The undeveloped areas in Shute Bay are characterised as having exceptional natural beauty and aesthetic importance as it includes scenery with islands, azure waters, and beneath the water, corals. However, existing coastal developments are contiguous with the project site and from many viewpoints form the dominant visual feature.

Existing visual amenity from the air over Shute Bay is predominantly a natural environment with recognisable marine infrastructure developments (barge and ferry terminals) located at the northern entrance to the Bay. The project will result in the addition of a relatively large marina development in the north of Shute Bay, adjacent to the existing barge and ferry terminals.

The project will involve the clearing of both terrestrial (2.59 ha) and marine (at least 27 ha) habitats for the construction of the marina, resort and associated amenities. Construction of the project will involve reclamation of 7.66 ha of land. The project will increase coastal development in Shute Bay, further reducing the naturalness of the environment.

The site will be visible from walking tracks in Conway National Park that overlook Shute Bay and from the existing developments adjacent to the project site. The site will not be visible from the World Heritage Area outside Shute Bay because Repair, Tancred and Shute islands will shield the view from the open water outside the Bay (Refer Figure 7.5). When approaching Shute Harbour from the sea, residential developments at Shutehaven will be visible before the proposed development comes into view.



 <p>PLACE PLANNING DESIGN ENVIRONMENT</p>	<p>PLACE Design Group Pty Ltd Level 1, 282 Wickham Street Fortitude Valley, Qld 4006 AUSTRALIA</p>	<h2>SHUTE HARBOUR SUBJECT SITE</h2>	<p>DATE: 09/07/2008 FIGURE NO: 01 DWG NO./ISSUE: SHU01_01/C SCALE: AS INDICATED</p>
	<p>T+ 61 7 3852 3922</p>		
	<p>F+ 61 7 3852 4766</p>		

Figure 7.5 Shute Bay and barrier islands

Visual amenity of the project site below the ocean surface consists of several small coral communities (0.44 ha in total) and sparse seagrass cover (12.7 ha in total). There is minimal abundance and diversity of shapes, sizes and corals within Shute Bay often characteristic of the Great Barrier Reef.

The proponent has proposed design criteria that maintain views to Shute Bay from Shute Harbour Road through strategically spacing buildings between 4 and 32 m apart and incorporating narrow vertical elements to reinforce the verticality of yacht masts. Furthermore, the proponent will incorporate a subdued colour palette for the development and to incorporate articulated facades and balconies on the apartments and hotel to avoid the appearance of a uniform built form to enhance visual integration with the forested mountain backdrop of Conway National Park.

Lighting from the project will create an additional light source within Shute Bay, but will only be visible from the same daylight viewpoints discussed above. The area surrounding the project site is already artificially lit by existing development. The proponent has proposed to reduce lighting impacts through incorporating vegetation screening and timers and motion detectors for external lights at the development. In addition, I require all lighting fixtures to be installed to prevent upward light spill as stated in Appendix 1 in this report.

Noise, odours, pollutants or other intrusive elements

Noise emissions during construction of the project are expected to be characterised as low frequency noise (below 200 hertz). Earthmoving equipment, and pumps for dredging and tailwater are expected to be the main sources of noise during construction. The proponent has committed to noise emission controls which are compliant with the Environmental Protection (Noise) Policy 2008.

Pile driving and dredging activities are not expected to result in high levels of underwater noise, due to the type of equipment and methods to be used. Further information regarding pile driving and dredging activities is discussed above in Section 7.2.2, on page 90.

Noise generated during operations will be from air conditioning and refrigeration plants and equipment on site. These plants and equipment will be stored within designated plant rooms that will be soundproof to mitigate noise impacts and impacts from this noise will be avoided.

Odours and pollutants will be emitted during construction and operation of the project. Earthmoving activities and equipment will generate dust and odours during construction of the project. The impacts from odours and pollutants emitted during construction will be temporary and this report states a condition to reduce impacts from dust including implementing dust-suppression measures to prevent visible airborne dust extending beyond the project site boundary.

Marine traffic and fuelling facilities will emit pollutants during project operations. The proponent has proposed to operate and maintain refuelling and oil storage areas to minimise emissions to the atmosphere and marine environment. Requirements to limit the impacts of pollutants are included as conditions stated in Appendix 1 in this report.

Water quality

Water quality of Shute Bay may be temporarily impacted by dredge plumes during capital and maintenance dredging of the access channel. Dredge plumes will be contained by silt curtains during dredging and surrounding water quality will be monitored to ensure that water quality complies with water quality objectives as stated in Appendix 1 in this report.

Water quality in Shute Bay may also be contaminated by spills and wastes during construction and operation. Spills and wastes will be managed in accordance with waste regulation and the project's waste management plan as stated in Appendix 1 in this report. Furthermore, the marina will be operated according to the Marina Industries Association of Australia (MIAA) 'Clean Marinas' accreditation program. Booms, spill kits and containment systems will be kept on site for emergency use to contain spills. Water quality impacts from dredge plumes and spills will be managed to reduce impacts and water quality will be monitored to ensure compliance. Conditions are stated in this report relating to spill prevention and response measures to reduce impacts from oil spills.

Construction of the project will involve the diversion of stormwater along the south edge of Shute Harbour Road to re-direct stormwater from the Conway National Park to the east and west sides of the project site. The proponent has proposed to line the channel with geo-textile and install sediment traps to control erosion and sedimentation respectively. Stormwater will be managed and treated prior to discharge into Shute Bay, so that water quality within the Bay is not negatively impacted by contaminants and debris. Water sensitive urban design (WSUD) principles will be incorporated into the development plan that will treat stormwater prior to discharge into Shute Bay. The proponent has proposed to install five bio-retention basins and eleven bio-retention swales on-site and will construct them in accordance with the *Guideline specifications for soil media in bioretention systems*²⁴ and *Water sensitive urban design technical design guidelines for South East Queensland*²⁵. Furthermore, stormwater discharged from the project will be required to meet water quality objectives that will be determined after the proponent has completed at least 12 months of water quality monitoring prior to construction commencing.

Conclusion

The following proponent's commitments would minimise impacts to this criterion of the WHA:

- implementing design criteria and colour palette to reduce impacts on visual amenity
- implementing noise emission controls and storing plants and equipment in soundproofed rooms to reduce noise impacts
- dust-suppression methods will be used during construction to reduce impacts to air quality

²⁴ Facility for Advancing Water Biofiltration, Monash University.

²⁵ Healthy Waterways 2006.

- installing silt curtains around construction works and around maintenance dredging works, and implementing spill and waste management plans to reduce impacts to water quality.

The Code of Development agreed to by the Whitsunday Regional Council and stated as a condition in the report requires the implementation of the above measures to reduce impacts to visual amenity.

In light of these mitigation measures and considering the disturbed nature of Shute Bay in the vicinity of the site, I consider the impacts to the outstanding universal value of the GBRWHA for the purposes of this criterion to be not unacceptable.

7.5.2. Criterion VIII

Representing major stages of earth's history, including the recording of life, significant ongoing geological processes in the development of landforms, or significant geomorphic or physiographic features

The Great Barrier Reef is a globally outstanding example of an ecosystem that has evolved over millennia. It forms the world's largest coral reef ecosystem, ranging from inshore fringing reefs to mid-shelf reefs, and exposed outer reefs, including examples of all stages of reef development.

The OUV relating to this criterion include the uniqueness of landforms and evidence of geological evolution including:

- reef morphologies of the Great Barrier Reef
- record of climate and sea level changes and history of the reef's evolution
- distinctive formations such as dune systems and tidal deltas.

The project may impact on this OUV through land reclamation, clearing coral communities for construction and changes to the hydrodynamics of Shute Bay.

Landforms

The project proposes to reclaim 2.4 ha of land to create an isthmus that will extend 240 m into Shute Bay. This will alter the coastline of Shute Bay. Earthworks for the construction of the project involve some levelling of land adjacent to Shute Harbour Road, which is considered to be a minor change to the landscape of Shute Bay.

Hydrodynamics

The proposed marina is likely to cause localised changes to current, tide, wave and sediment patterns at and near the marina. Marina construction is expected to cause turbidity locally, particularly during the temporary closure of the basin and during dredging of the access channel. The marina will be constructed to maintain adequate flushing and water circulation to maintain water quality within the basin.

The proponent has proposed to reduce impacts to hydrodynamics by installing a sediment trap to prevent sediment from the Conway Ranges being transported into the marina basin during flood flows and using a small to medium cutter suction dredge to limit the amount of suspended sediment generated during dredging. In addition I have stated conditions requiring the proponent to monitor seagrass during and following

construction to detect and respond to changes in seagrass area and abundance which may be impacted by changes in hydrodynamics.

Conclusion

The following proponent's commitments would minimise impacts to this criterion of the WHA:

- water quality of diverted stormwater will be managed prior to discharge into Shute Bay
- sediment traps will be installed to reduce impacts to water quality of Shute Bay
- a small to medium cutter suction dredge will be used to limit impacts from suspended sediment on water quality during dredging.

I have stated conditions in Appendix 1 of this report to ensure that water quality is maintained during discharge of water from the project site.

Approximately 0.44 ha of coral communities will be cleared at the project site for construction, which is a small area compared to the existing coral communities in the Whitsunday region.

The project site does not contain any important geological features associated with the GBRWHA.

Notwithstanding these mitigation measures I consider the residual impacts of the project are significant and this report states a condition for an offsets management plan to be developed in consultation with the Department of the Environment, the Great Barrier Reef Marine Park Authority (GBRMPA), and other relevant stakeholders.

With the conditions as stated, I consider the impacts to the outstanding universal value of the GBRWHA for the purposes of this criterion to be not unacceptable.

7.5.3. Criterion IX

Representing significant ongoing ecological and biological processes in the evolution and development of terrestrial, freshwater, coastal and marine ecosystems and communities of plants and animals

The OUV for this criterion focus on ecological processes, interconnectivity and biological evolution of the Great Barrier Reef ecosystem, including inshore coastal waters and continental islands (refer to attached statement of OUV).

The statement of OUV describes the extent of diversity of flora and fauna and the important habitat areas for resident species including shorebirds, cetaceans, sea turtles and dugongs.

The project may impact on OUV through impacting on ongoing ecological and biological processes by the clearing of habitats such as coral communities, seagrass algal and mangrove habitat and potentially reducing water quality in Shute Bay.

Marine and intertidal ecosystems

Shute Bay and surrounding areas provide potential foraging habitat for birds and marine megafauna including dugongs and marine turtles. Shute Bay does not support

suitable nesting habitat for turtles, however seagrass meadows may be of regional importance as a foraging resource. Higher quality and less disturbed shorebird foraging habitat is present elsewhere in the Whitsunday region.

Shute Bay is one of the few shallow water embayments in the Whitsunday region with extensive permanent coastal development.

The project will clear approximately 1.8 ha of mangroves for construction.

Approximately 9.6 ha of seagrass is proposed to be cleared for the construction of the marina basin. The access channel covers 3.1 ha, which for the purposes of this report is assumed to support a total coverage of in seagrass but will be confirmed prior to construction commencing.

The proponent has proposed to reduce impacts on remaining marine and intertidal habitats through using dredge material to construct the marina reclamation (breakwater) rather than dumping at sea. Further mitigation includes managing acid sulfate soils in accordance with best practice and using silt curtains, oil spill booms, bunding and trenching to reduce impacts to these habitats. However, significant residual impacts to seagrass and mangroves remain that requires offsetting in accordance with the EPBC Act. The proponent has proposed to develop a marine habitats offset plan in consultation with the Department of the Environment, GBRMPA and other relevant stakeholders. The plan will be implemented to improve and/or maintain the viability of seagrass and mangroves to compensate for losses.

Coral

Hard and soft corals occur within Shute Bay and around nearby islands. Construction of the project will involve clearing 10 coral communities within the project site that cover approximately 0.44 ha. The communities are sparsely distributed and are relatively small. The communities show no signs of bleaching or stress and are generally in healthy condition.

In addition to clearing the coral communities, the project may result in increased suspended sediment and increased nutrient levels within the bay during both construction and operation, which may temporarily affect the coral growth in Shute Bay.

Water quality

Water quality of Shute Bay may be reduced by polluted stormwater and other contaminants from the project entering the bay. Poor water quality may degrade habitats and thus the likelihood of species utilising these habitats.

The proponent has proposed to manage stormwater to reduce impacts to water quality in Shute Bay by installing gross pollutant traps, bio-retention systems and swales. Furthermore water released from stormwater systems is required to meet water quality discharge criteria for marina operations.

The proponent is conditioned to undertake water quality monitoring in Shute Bay over at least 12 months, having regard to the *Environmental Protection (Water) Policy 2009 (Proserpine River, Whitsunday Island and O'Connell River Basins Environmental Values and Water Quality Objectives)* (DEHP 2013). The project is also conditioned to establish site-specific discharge criteria based on results of the water monitoring

program and defined water quality objectives which in turn will be included in a dredge management plan to be submitted to DEHP in support of an application for development permit for operational works as conditioned by DEHP, and the Commonwealth Minister for the Environment for approval (Appendix 1–3).

Impacts to Aboriginal and Torres Strait Islanders and their sea-country

The project site is located within an area of traditional interest to the Ngaro and Gia Aboriginal peoples. Although no physical evidence of Aboriginal occupation was found at the site, the site holds cultural interest.

The project has received support from the Ngaro and Gia people and the proponent has entered into a voluntary Cultural Heritage management plan with them, which provides details on the proposed Cultural Centre. The report states a condition that the proponent must construct an indigenous cultural centre that includes a galley and theatre.

Conclusion

The following proponent's commitments would minimise impacts to this criterion of the WHA:

- dredge material will be used in land reclamation rather than dumped at sea, to avoid impacts on marine ecosystems
- acid sulfate soils will be managed to reduce impacts to marine water quality
- silt curtains, oil spill booms, bunding and trenching will be utilised to reduce the risk of contaminant spills affecting marine water quality and ecosystems
- gross pollutant traps and bio-retention systems will be installed to manage stormwater discharge into Shute Bay to reduce impacts to water quality.

I have stated conditions in this report to ensure these commitments are implemented as part of the project.

The proponent is required to undertake seagrass surveys and monitoring to assess the magnitude of impacts to seagrass habitat associated with construction of the marina. This includes a pre-construction survey, annual surveys during construction and for 5 years following construction and every 10 years for the life of the approval after that to monitor changes in seagrass distribution and composition in Shute Bay following marina construction.

The proponent has proposed to develop habitat offsets plans for significant residual impacts to marine and terrestrial habitats. These offset plans would require approval from the Department of the Environment, prior to commencement of construction.

The marine habitat offset plan would be developed in consultation with the Department of the Environment, GBRMPA and other relevant stakeholders. The plan would detail direct and indirect offsets for marine habitats in accordance with the EPBC Act Environmental Offsets Policy.

The terrestrial offset management plan would detail any rehabilitation measures required of potential offset areas and a monitoring program to determine the efficacy of these management and rehabilitation actions.

To ensure that significant residual impacts to OUV are adequately compensated for, I have stated a condition in Appendix 1 of this report requiring the proponent to develop an offset plan which must be approved by myself and the Commonwealth Minister for the Environment prior to commencement of construction.

The project will not impact on any physical evidence of Aboriginal occupation at the site and the project has support of the traditional custodians of the area.

In light of these mitigation measures, I consider the impacts to the GBRWHA for the purposes of this criterion to be not unacceptable.

7.5.4. Criterion 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 and conservation

The enormous size and diversity of the Great Barrier Reef means it is one of the richest and most complex natural ecosystems on earth, and one of the most significant for biodiversity conservation. The extensive diversity supports tens of thousands of marine and terrestrial species, many of which are of global conservation significance.

The statement of OUV relating to this criterion focuses on the presence of a range of rare and endangered species within the GBRWHA (refer to Appendix 6). Areas nearby the project site support both marine and terrestrial species of conservation significance that form part of the OUV of the GBRWHA, including:

- three terrestrial species of conservation significance known to occur in Conway National Park, including the Proserpine rock-wallaby (*Petrogale persephone*) (endangered), northern quoll (*Dasyurus hallucatus*) (endangered) and spectacled flying fox (*Pteropus conspicillatus*) (vulnerable)
- four marine species that are listed as migratory under the EPBC Act, including the humpback whale (*Megaptera novaeangliae*) (vulnerable), dugong (*Dugong dugon*), Indo-Pacific humpback dolphin (*Sousa chinensis*) and the Australian snubfin dolphin (*Orcaella heinsohni*)
- four species of marine turtles, including the loggerhead turtle (*Caretta caretta*) (endangered), green turtle (*Chelonia mydas*) (vulnerable), hawksbill turtle (*Eretmochelys imbricata*) (vulnerable), and flatback turtle (*Natator depressus*) (vulnerable), which are listed threatened species but also listed as migratory species under the EPBC Act.

The project is not likely to impact on any listed threatened ecological communities or threatened flora species.

Construction of the project will involve clearing of terrestrial and marine habitat, which form part of the Great Barrier Reef World Heritage Area's outstanding universal value. The area does not support primary roosting habitat for any threatened bird species, although humpback whales are known to rest with their calves in the passages around the Whitsunday islands to the east of the project site.

The proponent has proposed to develop and implement a fauna survey and monitoring program in order to assess the fauna habitat values of the proposed terrestrial offset area prior to construction of the marina and to monitor changes in these values during the implementation of the Terrestrial Offsets Management Plan and the operational phase of the SHM project. As the proposed terrestrial offset site is not considered adequate, I have stated in a condition that the proponent must develop an offset for impacts to terrestrial threatened species habitat.

Terrestrial habitat

Habitat for terrestrial threatened species including the Proserpine rock-wallaby, northern quoll and spectacled flying-fox is present immediately to the north of the project site and populations of these species are likely to be present in the Conway National Park generally. Construction of the project requires clearing of up to 0.94 ha of terrestrial vegetation. The vegetation to be cleared is limited to the area south of Shute Harbour Road within the project site and is considered to be degraded and impacted by Shute Harbour Road,

Road traffic related to the project may also impact on threatened terrestrial fauna through road strike that may cause injury or fatalities. Road kill of Proserpine rock-wallabies is common along Shute Harbour Road, particularly at Flametree Hill. Heavy vehicles and increased traffic numbers associated with the project along the road are likely to increase the risk of road kill to the wallaby. Significant residual impacts to this species require offsetting in accordance with the EPBC Act Environmental Offsets Policy.

Marine fauna

Marine fauna, including marine turtles, dugong, humpback whales, inshore dolphins and crocodiles are known to frequent the Whitsunday region. In Shute Bay, green turtles are commonly sighted and dugongs are occasionally sighted. Shute Bay supports foraging habitat these species. Humpback whales travel and rest in the passages beyond Shute Bay within the Whitsunday islands.

Seagrass and potential seagrass habitat within Shute Bay will be cleared for the project. Dugong and green turtles favour the species of seagrass that grows in Shute Bay, which is approximately half way between two dugong protection areas that are located north and south of Shute Bay.

Marine megafauna that frequent the area surrounding the project site may be at risk of boat strike from marine vessels, particularly with increasing vessels using the area as a result of the project. Since 2006, a total of ten marine megafauna mortalities due to boat strike have been recorded in the Whitsunday area. The proponent has proposed several mitigation measures to mitigate boat strike impacts to marine megafauna, however these are not considered likely to be effective. As such I have stated in conditions in Appendix 1 in this report that offsets for boat strikes to marine fauna are required.

Vibratory or hydraulic methods of pile driving will be used to install piles during construction and cutter suction dredging will be used to dredge the access channel. These methods were chosen to reduce impacts from underwater noise on marine

megafauna, as they are low impact methods that do not create high levels of underwater noise. The proponent has proposed to implement a number of mitigation measures to further reduce impacts to marine megafauna during pile driving activities; these are outlined in Section 7.3.4.

Conclusion

The following proponent's commitment would minimise impacts to the OUV of the GBRWHA:

- utilising low underwater noise generating equipment and methods for pile driving and dredging.

I have stated conditions in Appendix 1 of this report to ensure this commitment is implemented as part of the project.

The proponent has proposed to develop a marine habitat offset plan that would include details on offsets for seagrass. This offset plan would require approval from the Commonwealth Minister of the Environment prior to construction of the marina commencing.

The proponent has also proposed to establish a Reef Conservation Fund as an offset to significant residual impacts on the OUV of the GBRWHA. The fund will provide details of research and management opportunities within the Whitsunday region and timeframes for implementation of the funding. The Reef Conservation Fund offset would require approval from the Commonwealth Minister of the Environment prior to construction of the marina.

To ensure that significant residual impacts to OUV are adequately compensated for, I have stated a condition requiring the proponent to develop an offset plan which must be approved by the Commonwealth Minister for the Environment prior to commencement of construction.

Notwithstanding the mitigation measures, I consider that the residual impacts to the GBRWHA for the purposes of this criterion are significant and require offsetting in accordance with the EPBC Act Environmental Offsets Policy.

7.5.5. Integrity and management of the GBRWHA

Integrity of the GBRWHA is summarised in the statement of OUV in the following manner:

The ecological integrity of the Great Barrier Reef is enhanced by the unparalleled size and good state of conservation across the property. At the time of inscription it was considered that to include virtually the entire Great Barrier Reef and its lagoon within the property was the most effective way to ensure the integrity of the coral reef ecosystems in all their diversity.

The property is subject to a number of natural pressures, including cyclones, crown-of-thorns starfish outbreaks and sudden large influxes of sediment-laden freshwater from seasonal and extreme weather events. As well, there is a range of human uses and pressures such as tourism, shipping and coastal developments including ports that may impact the property. There are also some disturbances facing the Great Barrier

Reef that are legacies of past actions prior to the inscription of the property on the World Heritage list.

At the scale of the Great Barrier Reef ecosystem, most habitats or species groups have the capacity to recover from disturbance or withstand ongoing pressures. The property is largely intact and includes the fullest possible representation of marine and island ecological, physical and chemical processes from the coast to the deep abyssal waters enabling the key interdependent elements to exist in their natural relationships.

Some of the key ecological, physical and chemical processes that are essential for the long-term conservation of the marine and island ecosystems and their associated biodiversity occur outside the boundaries of the property and thus effective conservation measures are essential across the adjoining catchments and marine and coastal zones.

The project is proposed to be located on the shoreline and within the GBRWHA at Shute Bay, which is recognised as a node of coastal development. The footprint (25.2 ha for the marina and 3.1 ha for the access channel) of the project is minor compared to the entire area of the World Heritage property (34.8 million ha). Potential impacts of the project on the integrity of the GBRWHA are largely limited to the project site and would not significantly affect the Great Barrier Reef. The intensity and scale of impacts will be minimised through mitigation and management measures, and a net benefit to the GBRWHA will be achieved through offsets.

The size of the World Heritage property will not be substantially reduced by the project and neither will the project result in the substantial modification or loss of any unique features that define the heritage value of the property. The project does not diminish the property's outstanding universal value or the range of features and processes, which convey the World Heritage Area's significance.

Increases in the likelihood, frequency and intensity of anthropogenic impacts to the GBRWHA as a result of the project are anticipated to occur, as described above. Cyclones and other extreme weather events will still occur.

The proponent has proposed to establish a Reef Conservation Fund as an offset to significant residual impacts on the OUV of the GBRWHA. As described previously, the fund is proposed to support research and management of the Great Barrier Reef within the Whitsunday region. I expect that the proponent will provide additional details around the administration and implementation of such a fund in the offset plan required in the conditions. I note that the Commonwealth Government has committed to developing a Reef Trust as part of its Reef 2050 Plan and that this may be a suitable mechanism by which the proponent's proposed offset could be delivered.

Property management arrangements

The statement of OUV of the GBRWHA states that the EPBC Act provides an overarching mechanism for protecting the World Heritage values from inappropriate development, including actions taken inside or outside which could impact on its heritage values. This requires any development proposals to undergo rigorous environment impact assessment processes, often including public consultation, after which the Commonwealth Minister may decide to approve, reject or approve under conditions designed to mitigate any significant impacts.

Other management arrangements that protect matters of State and national significance and support the EPBC Act in protecting the GBRWHA include the following:

- *Great Barrier Reef Marine Park Act 1975* (Cwlth)
- *Sustainable Planning and other Legislation Act 2012*
- *Environmental Protection Act 1994*
- *Marine Parks Act 2004*
- *Nature Conservation Act 1992*
- *Transport Operations (Marine Pollution) Act 1995*

7.5.6. Cumulative impacts—GBRHWA

Cumulative impacts to the OUV of the GBRWHA as a result of the project include coastal development and associated pressures, water quality, habitat loss and vehicle/vessel strike to threatened species.

Visual amenity

The project will contribute to increased coastal development in Shute Harbour and the Whitsunday region. Visual amenity from the air and from the water within Shute Bay will be impacted by the project. Visual amenity from the water outside Shute Bay will be shielded by Repair, Tancred and Shute islands. The proponent has proposed to minimise impacts to visual amenity through applying design criteria that will maximise views to Shute Bay from Shute Harbour Road and maintain visual amenity values.

Water quality

The project may contribute to cumulative impacts on water quality during construction and operation. Construction activities such as dredging and land reclamation may increase suspended sediment concentrations in Shute Bay, reducing water quality. Operational activities including boating activities may also reduce water quality through bilge discharge and oil spills. Other operational activities such as stormwater management may increase pollutant and suspended sediment concentrations in Shute Bay. The proponent has proposed to implement mitigation measures to minimise impacts to water quality included in environmental management plans. I have stated conditions in this report requiring the proponent to conduct at least 12 months of water quality monitoring prior to construction commencing in order to determine water quality criteria for the project. Water quality impacts from the project are considered to be manageable and therefore, not unacceptable.

Marine ecology

Cumulative impacts to marine fauna are discussed in Section 7.3.5 and include habitat loss and boat strike. The proponent has proposed to mitigate these impacts but the residual impacts are considered to be significant and require offsetting. Impacts from habitat loss and boat strike are considered not to be unacceptable.

Terrestrial ecology

Cumulative impacts to terrestrial ecology include habitat loss and degradation and road strike impacts on the Proserpine rock-wallaby. The proponent has proposed to mitigate

these impacts but the residual impacts are considered to be significant and require offsetting.

7.6. Commonwealth marine areas

The Commonwealth marine area (CMA) is any part of the sea, including the waters, seabed, and airspace, within Australia's exclusive economic zone and/or over the continental shelf of Australia, that is neither State nor Northern Territory waters.

In general terms, the CMA stretches from 3 to 200 nautical miles from the coast. Marine protected areas are marine areas that are recognised to have high conservation value.

Marine bioregional plans have been developed for the Commonwealth marine area to support the decision-making process for marine-based industries under the EPBC Act. As part of this process, new Commonwealth marine reserves have been identified by the department for the conservation of marine ecosystems and biodiversity of Australia's oceans. These reserves are intended to meet Australia's commitments to establish a National Representative System of Marine Protected Areas.

Five marine regions have been identified as part of the bioregional planning process, including Southwest, North-west, North, East (Temperate East and Coral Sea) and South-east Marine Regions.

The nearest marine reserve to the project is the Coral Sea marine reserve that surrounds the Great Barrier Reef Marine Park. There is currently no bioregional plan for the Coral Sea marine reserve.

The proposed development site is on the coastline within State coastal waters and approximately 20 nautical miles from the CMA. Due to this distance, the project is not expected to directly impact on Commonwealth marine areas. Minor consequential impacts on CMAs from increased recreational boating activity are possible.

Visitors to Shute Harbour would typically intend to visit the reefs and islands within the Whitsunday region with very few boat operators venturing to the outer reef or CMAs.

The project is therefore not expected to contribute to cumulative impacts on CMAs.

7.7. Ecologically sustainable development

My assessment of the project has taken into account the principles of ecologically sustainable development, which as defined in Part 1, section 3A of the EPBC Act, are:

- decision-making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations
- 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

- 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 conservation of biological diversity and ecological integrity should be a fundamental consideration in decision making
- improved valuation, pricing and incentive mechanisms should be promoted.

My report has analysed and taken into consideration the information from the EIS and additional material concerning the long-term and short-term economic, environmental, social and equitable considerations that are relevant to the project.

Any lack of certainty related to the potential impacts of the project is addressed by conditions that restrict environmental impacts, impose strict monitoring and adopt environmental standards which maintain environmental values.

The proposed conditions will ensure protection of World Heritage properties, listed threatened species, listed migratory species and Commonwealth marine areas. These conditions allow for the project to be delivered and operated in a sustainable way to protect the environment for future generations and preserve matters of national environmental significance.

I have considered the importance of conservation of biological diversity and ecological integrity in relation to all of the controlling provisions for this project, and the assessment provided within my report reflects that consideration.

My evaluation of the project presented in this report also considers a range of information on the economic costs, benefits and impacts of the project. I have sought to ensure that financial costs of compliance with the conditions are reasonable to the extent that the project can proceed whilst also making a fair contribution to environmental protection.

7.8. Coordinator-General's overall conclusions

I have reviewed the EIS and additional material, including the amended MNES report, and conclude that the proponent has adequately identified the impacts of the project on the OUV of the GBRWHA, TECs, threatened flora and fauna and migratory species listed under the EPBC Act. My conclusion on the mitigation and management measures proposed by the proponent, and the conditions stated in this report is that the project is not inconsistent with any of the international conventions relevant to threatened species and communities, migratory species, the GBRWHA and Commonwealth marine areas.

Construction

The proponent has adequately identified the potential impacts that the project poses to MNES during construction.

I require the proponent to manage the following impacts through conditions stated in this report, to ensure that there are no unacceptable impacts to MNES during construction:

- disturbance to threatened and migratory species habitat;
- injury and mortality of threatened and migratory species;
- degradation of water quality beyond the project site;
- degradation of the outstanding universal value of the Great Barrier Reef World Heritage Area.

With the conditions of approval as stated, I consider the impacts to MNES from construction of the Shute Harbour Marina to not be unacceptable.

Marine turtles

The proponent has adequately identified the potential impacts that the project poses to marine turtles.

I require the proponent to manage impacts to marine turtles through conditions stated in this report, including:

- limiting the area of disturbance of marine turtle habitat;
- managing the quality of water being released from the project site;
- managing noise from piling and dredging; and
- providing offsets for significant residual impacts.

In light of the proposed mitigation measures and conditions I have imposed, I consider the impacts to marine turtles to be neither unacceptable nor inconsistent with the recovery plan for marine turtles and relevant threat abatement plans. However, the residual impacts to foraging habitat (seagrass) are considered to be significant impacts requiring offsetting in accordance with the EPBC Act Environmental Offsets Policy.

Humpback whale

The proponent has adequately identified the potential impacts that the project poses to the humpback whale.

I require the proponent to manage impacts to humpback whales through conditions stated in this report, including:

- managing water quality of water being released from the project site;
- managing noise from piling and dredging; and
- providing educational material to marina users.

In light of the mitigation measures, I consider the project impacts on the humpback whale to be neither unacceptable nor inconsistent with the species' recovery plan or the threat abatement plan for marine debris.

Proserpine rock-wallaby

The proponent has adequately identified the potential impacts that the project poses to the Proserpine rock-wallaby.

I require the proponent to manage impacts to the Proserpine rock-wallaby through conditions stated in this report, including:

- limiting the disturbance to habitat;
- managing construction-related traffic along Shute Harbour Road;

- planting non-toxic species in the project site; and
- providing offsets for significant residual impacts.

In light of the mitigation measures, I consider the project impacts on the Proserpine rock-wallaby to be neither unacceptable nor inconsistent with the species' recovery plan or threat abatement plan for feral cats.

Spectacled flying-fox

The proponent has adequately identified the potential impacts that the project poses to the spectacled flying-fox.

I consider that impacts to the spectacled flying-fox are unlikely due to the disturbed nature of the site and distance to known roost site. As such I consider the impacts to the species to be not unacceptable and not inconsistent with the species' recovery plan.

Northern quoll

The proponent has adequately identified the potential impacts that the project poses to the northern quoll.

I require the proponent to implement measures to reduce impacts to the northern quoll, including:

- limiting the disturbance to habitat; and
- providing offsets for significant residual impacts.

In light of the mitigation measure, I consider that the impacts to the species are not unacceptable and not inconsistent with the species' recovery plan.

Migratory birds

The proponent has adequately identified the potential impacts that the project poses to migratory terrestrial birds.

Given that the habitat to be cleared is minimal and does not constitute important habitat for any of the listed migratory bird species likely to occur in the area, I consider the impacts of habitat loss and degradation to be not unacceptable. Additionally, there is no significant residual impact on migratory terrestrial birds requiring offsetting. I have given consideration to the listing advice for the southern giant-petrel and the little tern and conclude that the project is not inconsistent with the southern giant-petrel's recovery plan.

Migratory marine fauna

The proponent has adequately identified the potential impacts that the project poses to migratory marine fauna.

I require the proponent to implement measures to reduce impacts to migratory marine fauna, including:

- limiting the area of disturbance of migratory marine fauna habitat;
- managing quality of water being released from the project site;
- managing noise from piling and dredging; and

providing offsets for significant residual impacts.

In light of the mitigation measures, I consider that the impacts to migratory marine fauna are not unacceptable and that approving the project would not be inconsistent with Australia's obligations under the Bonn Convention.

Great Barrier Reef World Heritage Area

The proponent has adequately identified the potential impacts that the project poses to the Great Barrier Reef World Heritage Area.

I require the proponent to implement measures to reduce impacts to the outstanding universal value of the Great Barrier Reef World Heritage Area, including:

- limiting the area of disturbance;
- managing quality of water being released from the project site;
- ensuring design of built form reduces impacts to visual amenity; and
- ensuring there are adequate funds to rehabilitate the site if construction is not completed; and
- providing offsets for significant residual impacts.

In light of the mitigation measures, I consider that the impacts to the outstanding universal value of the GBRWHA are not unacceptable and that approving the project would not be inconsistent with:

- Australia's obligations under the World Heritage Convention; or
- The Australian World Heritage management principles.

Offsets

A final offset proposal must be presented to the Coordinator-General and DOTE for approval following further detailed investigations. I note the proponent has advised that project construction will not commence prior to the Commonwealth Minister's approval of the project's offset plan.

Recommended conditions

It is recommended that the Commonwealth consider the following conditions of approval in addition to the State's conditions listed in Appendix 1-3.

- (1) The proponent must not remove more than:
 - (a) 12.7 ha or the amount identified in pre-construction surveys, required under recommended condition 6 below, whichever is larger, of seagrass habitat for marine turtles/dugongs (*Dugong dugon*), nor
 - (b) 0.94 ha of terrestrial habitat for Proserpine rock-wallaby (*Petrogale Persephone*), and the northern quoll (*Dasyurus hallucatus*)
- (2) The proponent is to ensure that all landscaping for the development will include native plant species to that are unlikely to be toxic to the rock-wallaby.

Marina

- (3) The proponent must construct the marina to ensure at least 85% flushing of water within the marina basin within a 24 hour period. Actual flushing rates within the marina basin must be measured prior to commercial occupation of the marina to ensure compliance with this condition. Results confirming marina flushing requirements have been met must be published in the next due annual report as required in Appendix 1. Condition 63.
- (4) The proponent must install signage at a minimum of five locations within the Shute Harbour Marina, informing marina users that the surrounding area includes the Great Barrier Reef World Heritage Area (GBRWHA) and habitat for EPBC listed threatened and migratory species, and providing advice about how to minimise impacts on Matter of National Environmental Significance (MNES) from boating activities (including boat strike), vehicle travel between Shute Harbour Marina and Airlie Beach, fishing and pets. Each sign must be installed in a high traffic area of Shute Harbour Marina prior to commercial occupation of the marina and be not less than 1.5 square metres in size.
- (5) The proponent must provide educational material to marina users and staff about the values of MNES in the vicinity of Shute Harbour Marina. Educational material must include, but not be limited to, advice about how to minimise impacts on MNES from boating activities (including boat strike), vehicle travel between Shute Harbour Marina and Airlie Beach, fishing, pets and other recreational activities. Educational material must be provided to marina users and staff upon commencement of accommodation or commencement of employment, and must be made available to all visitors to Shute Harbour Marina.

Construction

- (6) The proponent must not undertake disturbance of vegetation, excavation or reclamation within the site while EPBC listed species are within the area to be disturbed, excavated or reclaimed. The proponent must ensure that EPBC listed species are relocated from the Shute Harbour Marina site to nearby suitable habitat at least 500 metres away of the disturbance area. The relocation process must include but not be limited to
 - (a) completion of a preconstruction survey for EPBC listed species prior to construction in any area of the site; and
 - (b) engaging a suitably qualified expert to complete the relocation process.
- (7) The proponent must provide the Minister with an assurance, which the Minister may seek in the form of a bond, which will meet the cost of ensuring that discharges from Shute Harbour Marina meet approved discharge criteria pursuant to Appendix 1. Condition 37 in the event the proponent is unable to provide ongoing management of the resort. The proponent must provide adequate justification for the scope of works required to meet the objective of this condition. The form of the bond and its financial value must be approved by the Minister in writing, prior to commencing commercial occupation of Shute Harbour Marina

Environmental offsets

The Minister administering the EPBC Act has jurisdiction for the following conditions:

- (8) The proponent must prepare a proposed offset plan to address significant residual impacts to environmental values identified in the EIS, including matters of national environmental significance. Impacts to matters of national environmental significance that must be offset include:
 - (a) the loss of seagrass and potential seagrass habitat
 - (b) the loss of 0.94 ha of terrestrial habitat for Proserpine rock-wallaby and northern quoll
 - (c) additional road-strike injury and mortality of the Proserpine rock-wallaby
 - (d) additional boat strike injury and mortality of EPBC listed marine species
 - (e) additional impacts to the outstanding universal values of the Great Barrier Reef World Heritage Area (GBRWHA) arising from the construction and operation of the Shute Harbour Marina including water quality impacts, visual amenity impacts and impacts to habitats within the GBRWHA.
- (9) The offset plan must include, but not necessarily be limited to:
 - (a) a detailed description of all affected values and the extent and likely timing of the impact/s on each;
 - (b) detailed descriptions of how enhanced conservation outcomes for the affected MNES will be achieved in accordance with the EPBC Act Environmental Offsets Policy 2012;
 - (c) detailed costings for the measures that will be implemented to achieve these outcomes;
 - (d) timeframes and key milestones for implementation of offsets;
 - (e) discussion of the risks and uncertainties associated with proposed offsets;
 - (f) mechanisms for monitoring and reporting of offset milestones and outcomes, including timing and frequency of monitoring and reporting;
 - (g) mechanisms to ensure that offsets are maintained for the duration of the impacts;
 - (h) provisions and measures to ensure that actions taken to conserve, manage and protect MNES have no detrimental impact on the habitat and populations of other listed threatened species and ecological communities or migratory species that are identified as occurring at the offset site;
 - (i) Corrective actions and contingency measures to be implemented (including the timing of implementation of these) where monitoring of the offset area/s under the offset plan shows that key milestones are not being or are unlikely to be met;
 - (j) the offset delivery mechanism(s) comprising one or more of: land-based offsets; direct benefit management plans; offset transfers and/or offset payments;
 - (k) a legally binding mechanism that ensures protection and management of offset areas; and

- (l) provision of textual descriptions and maps clearly defining the locations and boundaries of offset areas. These must be accompanied by a GIS Shapefile.
- (10) The offset plan must be developed in consultation with the Commonwealth Department of the Environment, Great Barrier Reef Marine Park Authority and other relevant stakeholders.
- (11) The proponent must give consideration must be given to how offset funds will contribute to programs or incentives and that align with the broader strategies and programs for the conservation and protection of the Great Barrier Reef including, but not limited to, Reef Trust 2050.
- (12) The proposed offset plan must be approved by the Minister prior to commencement of construction.
- (13) The offset plan must be implemented within two years of commencement of construction, or as directed by the Minister.

8. Conclusion

The proponent is seeking approval for a 395-berth marina, hotel, retirement resort, managed resort dwellings, community cyclone shelter, emergency services centre, cultural centre, sailing club and associated marina and retail facilities at Shute Harbour.

In undertaking my evaluation of the EIS, I have considered the following:

- the EIS and additional material prepared for this project
- submissions on the EIS and SEIS.

I am satisfied that the requirements of the SDPWO Act have been adequately met and that sufficient information has been provided to allow me to evaluate the potential impacts of the project, the project mitigation strategies, and conditions of approval.

The environmental assessment commenced with the declaration of this project in July 2006. More detailed work will occur in the detailed design phase of the project.

The potential impacts identified in the EIS documentation and submissions have been assessed. I consider that the mitigation measures proposed by the proponent and required by the conditions stated in this report would result in acceptable overall outcomes. Further, an offsets package will be further developed and considered to address any significant residual impacts.

I am satisfied that the proponent has undertaken the necessary environmental investigations to identify the predicted project impacts. I note that further information and supporting documentation will need to be submitted to regulatory authorities to obtain subsequent approvals.

I conclude that there are local, regional and state benefits to be derived from the development, and that any adverse environmental impacts can be acceptably avoided, minimised, mitigated or offset through the implementation of the measures and commitments outlined in the EIS documentation and conditions stated.

Accordingly, I recommend that the project as described in this evaluation report proceed, subject to the conditions and recommendations in appendices 1–4. In addition, I expect the proponent's commitments to be fully implemented as presented in the EIS documentation and summarised in Appendix 5 of this report.

To proceed further, the proponent will be required to:

- obtain the relevant development approvals under SPA
- finalise and implement the construction and operations environmental management plans
- finalise the environmental offsets requirements.

If there are any inconsistencies between the project (as described in the EIS documentation) and the conditions in this report, the conditions shall prevail.

A copy of this report will also be available on the Department of State Development, Infrastructure and Planning's website at www.dsdip.qld.gov

Appendix 1. Stated conditions

This appendix includes the Coordinator-General's stated conditions for a preliminary material change of use, stated under section 39 of the *State Development and Public Works Organisation Act 1971* (Qld).²⁶

Condition 1. Offset plan

The Coordinator-General has jurisdiction for this condition.

- (a) The proponent must prepare a site based offset plan to address significant residual impacts that are not covered by Commonwealth requirements.
- (b) The offset plan must be lodged with the Coordinator-General no later than 60 days after a Commonwealth decision on offsets to address matters of national environmental significance.
- (c) The offset plan must be approved by the Coordinator-General
- (d) The approved offset plan must be implemented within one year of commencement of construction.

Development generally

The Whitsunday Regional Council has jurisdiction for the following conditions:

Condition 2.

The Shute Harbour Marina must be wholly located on Lot 2 SP117389, and a proposed lot A on drawing 13/512CEN as shown in Annexure A and be constructed in accordance with the Development Plan SEIS P64 (November 2013) shown as Figure 2.2 in this report.

Condition 3.

The portion of Lot 2 SP 117389 that is north of Shute Harbour Road must not be developed except where required for widening of Shute Harbour Road associated with the Shute Harbour Marina and depicted in the Shute Harbour Road Upgrade Plan SEIS P26 (SEIS Appendix GS13).

Condition 4.

- (a) The development must include:
 - (i) Open space, as outlined in SEIS P9, P10, P11, P14, P15, P19 and P20, (SEIS Appendix GS13) to soften the visual impact of the built form
 - (ii) The Indigenous Cultural Centre including a theatre and gallery
 - (iii) Emergency services centre comprising sea rescue and emergency services generally as described in the Appendix GS13, SEIS P38 of the supplementary information to the EIS.
 - (iv) Cyclone shelter generally as proposed in the Appendix GS13, SEIS P38 of the supplementary information to the EIS, constructed to accommodate 1000 people and withstand category 5 cyclones, and

²⁶ For a definition of 'stated conditions', refer to the Glossary on page 200 of this report.

- (A) The siting, design and construction of cyclone shelters must take into account Design Guidelines for Queensland Public Cyclone Shelters, available from www.hpw.qld.gov.au/construction/Projects/CycloneShelters/Pages/default.aspx
- (v) Dedicated berthing facilities suitable for a catamaran of up to 10 metres and a parking bay to accommodate a vehicle of 2 car lengths for police and emergency services use.

Condition 5.

The development, as required in Condition 4, is required to be completed within four years of commencement of the start of dredging activities.

Condition 6.

Building heights must not exceed three storeys for all buildings, with the exception of the buildings within the marina plaza precinct and the resort hotel and retirement resort (as specified in Appendix GS13 of the SEIS) which must not exceed 5 storeys or 23 metres in height (whichever height is lower).

Condition 7.

Colour schemes and design of the buildings must blend in with the geography and vegetation of the Conway National Park, as outlined in the code of development supplied in Appendix GS3 of the SEIS.

Condition 8.

Construction and operation activities must not cause environmental nuisance from noise at a sensitive place, other than where an alternative arrangement is in place.

Condition 9.

All lighting fixtures must be installed to prevent upward light spill.

Condition 10.

The proponent must ensure that no mosquitoes breed in the development's settlement/sediment ponds, drying ponds, water in bunds surrounding geotubes and any other stagnant water associated with the construction and operation of the Shute Harbour Marina.

Condition 11.

The proponent must ensure that no domestic cats or dogs are allowed off leash within the Shute Harbour Marina.

Services

The Whitsunday Regional Council has jurisdiction for the following conditions.

Condition 12.

All physical infrastructure required for essential services to the development will be provided and maintained at no cost to state or local government. The proponent must enter into an infrastructure agreement with the Whitsunday Regional Council before the

start of construction, for essential services including water supply and sewerage systems.

Condition 13.

All development will be connected to a reticulated water supply system and provided with a supply of potable water in accordance with applicable health and safety standards and water for fire fighting purposes.

Condition 14.

All development will be connected to a reticulated sewerage system and sewage will be treated and disposed of in accordance with applicable environmental standards.

Condition 15.

Septic tanks must not be installed within the development.

Condition 16.

All development will be provided with refuse collection facilities appropriate to service the development.

Receiving Environment Monitoring Program

The Department of Environment and Heritage Protection has jurisdiction for the following conditions:

Condition 17.

A Receiving Environment Monitoring Program (REMP) must be developed and implemented to monitor, identify, describe and respond to any adverse impacts to:

- (a) surface water quality
- (b) water flows
- (c) aquatic flora and fauna, and
- (d) any receiving waters.

Condition 18.

The REMP must include periodic monitoring for the effects of any release on the receiving environment as a result of contaminant releases to waters from the site.

Condition 19.

- (a) The REMP must:
 - (i) assess the condition or state of receiving waters spatially within Shute Bay (the REMP area), considering background water quality characteristics based on accurate and reliable monitoring data that takes into consideration temporal variation (e.g. seasonality)
 - (ii) establish parameters to be monitored including but not limited to turbidity and Total Suspended Solids (TSS), nutrients, metals and metalloids and justify:
 - (A) the parameters chosen, and
 - (B) assumptions and choices made in preparation of the REMP.

- (iii) be designed to facilitate assessment against water quality objectives for the relevant environmental values that need to be protected
- (iv) detail monitoring locations and water quality indicators pertinent to the sensitive receptor types and locations that have been designed to:
 - (A) determine the baseline condition of water quality and sensitive receptors (i.e., corals and seagrass meadows) within the zone of influence to a sufficient resolution to be capable of reliably detecting lethal and sublethal (stress) impacts
 - (B) develop or adopt locally-relevant trigger values for key water quality indicators including turbidity, and
 - (C) provide on-line real-time monitoring capability for key sediment plume-related indicators (including but not limited to turbidity, pH, EC).
- (v) specify the frequency and timing of sampling required in order to reliably assess ambient conditions and to provide sufficient data to derive site specific background reference values in accordance with the *Environmental Protection (Water) Policy 2009 (Proserpine River, Whitsunday Island and O'Connell River Basins Environmental Values and Water Quality Objectives)* (DEHP 2013)
- (vi) include, where appropriate, monitoring of metals/metalloids in sediments (in accordance with ANZECC & ARMICANZ 2000²⁷ and/or the most recent version of Australian Standard 5667.1)
- (vii) apply procedures and/or guidelines from ANZECC and ARMICANZ 2000 and other relevant guideline documents
- (viii) describe sampling and analysis methods and quality assurance and control, and
- (ix) justify all assumptions and choices made in preparation of the REMP.

Condition 20.

The REMP must be implemented for a minimum of 12 months prior to commencement of construction activity and not cease until construction is completed.

Condition 21.

A report outlining the findings of the REMP, including all monitoring results and interpretations must be prepared and made publicly available on the proponent's website annually, within one month of its completion and remain for the duration of the action. The first report must be published prior to the commencement of construction. This report must include an assessment of background reference water quality in the REMP area compared against the water quality objectives established in the REMP.

²⁷ ANZECC / ARMICANZ, 2000, 'Australian and New Zealand Guidelines for Fresh and Marine Water Quality

Marina

The Department of Environment and Heritage Protection has jurisdiction for the following conditions:

Condition 22.

- (a) Facilities used for storing environmentally hazardous materials within the project site must:
 - (i) be designed and located to ensure hazardous materials remain secured at all times, including during tropical cyclone events, and consider the potential effects of storm tide inundation, and
 - (ii) include secondary containment to prevent releases to the environment from spillage or leaks.

Condition 23.

Appropriate equipment to contain and remove spills must at all times be kept stored in a convenient position near the facility, and be available for immediate use.

Condition 24.

Common user facilities for the handling and disposal of ship-sourced pollutants, including oil, garbage and sewage, must be provided at a suitable location within the marina.

Condition 25.

- (a) The ship-sourced pollutants reception facility must be:
 - (i) designed and operated in accordance with best practice guidelines for waste reception facilities at ports, marinas and boat harbours in Australia and New Zealand, Australian and New Zealand Environment and Conservation Council 1997
 - (ii) connected to the water service provider's sewerage or other waste reception infrastructure, and
 - (iii) available to all vessels visiting the marina.

Construction

The Department of National Parks, Recreation, Sport and Racing has jurisdiction for the following conditions:

Condition 26.

- (a) The proponent must ensure that marine megafauna are relocated from the Shute Harbour Marina site. The relocation process must include but not be limited to:
 - (i) completion of a preconstruction survey for marine megafauna immediately prior to construction in any area of the site, and
 - (ii) engaging a suitably qualified expert to complete the relocation process.

The Department of Natural Resources and Mines has jurisdiction for the following conditions:

Condition 27.

The proponent must place a financial assurance with the Department of Natural Resources and Mines to meet all site rehabilitation costs in the event that construction works cannot be completed. The amount of the bond would be determined by a quantity surveyor and would be indexed bi-annually by CPI. The security must unconditionally guarantee to pay the Lessor/Department of Natural Resources and Mines on demand, the amount secured. The security will be returned to the lessee when final completion has been completed. The financial assurance must ensure that adequate funds are available to the Department of Natural Resources and Mines to complete the works described in a site rehabilitation plan which the proponent must submit to the Department of Natural Resources and Mines for approval. The bond may be provided in stages but must at all times be commensurate with the estimated cost of rehabilitation of the Shute Harbour Marina site at that stage of development.

Condition 28.

- (a) A site rehabilitation plan must be approved prior to commencement of construction and must include, but not be limited to:
- (i) scope of works required to decommission and remove the marina and land based facilities, including a timeframe for these works to be undertaken
 - (ii) details of the works required to rehabilitate the Shute Harbour Marina site at all stages of construction and operation
 - (iii) management measures required to reduce impacts to MNES during decommissioning and removal of the marina and land based facilities
 - (iv) details of disposal of marina and land based facilities including methods of disposal of hazardous or contaminated materials
 - (v) details of works to be undertaken to restore habitat for MNES after marina and land based facilities are removed
 - (vi) timeframe for restoration of habitat for MNES following removal of marina and land based facilities, and
 - (vii) detailed costings of all works identified for site rehabilitation.

The Department of Agriculture, Fisheries and Forestry has jurisdiction for the following condition.

Condition 29.

- (a) During construction of the marina, procedures must be:
- (i) implemented to avoid the entrapment of marine megafauna, and
 - (ii) consistent with Department of Agriculture, Fisheries & Forestry Fish Salvage Guidelines—
(http://www.daff.qld.gov.au/documents/Fisheries_Habitats/fish-salvage-guidelines.pdf).
- (b) The initial opening of the marina basin to tidal waters following excavation of the marina basin must be designed and implemented to not exceed discharge criteria approved under Condition 37.

The Whitsunday Regional Council has jurisdiction for the following conditions:

Condition 30.

All site works must be designed and supervised by an experienced and qualified geotechnical engineer and comply with section s1, Whitsunday Shire Council Development Manual and AS3798.

Condition 31.

Prior to commencement of any construction work, the proponent must ensure that efficient procedures for ensuring compliance with applicable environmental legislation, commitments made by the proponent in the SEIS dated 26 July 2013 and approval conditions are prepared and implemented and made available to all employees, contractors and subcontractors.

Condition 32.

The construction control and management documents must be made publicly available on the proponent's website prior to commencement of construction and must remain there until construction is completed.

Matters to consider in developing environmental management procedures include, but are not limited to:

- lighting and visual amenity
- soils, erosion and sediment control
- native flora and fauna
- weeds and pests
- surface waters
- dust and air quality
- noise and vibration
- waste management.

Condition 33.

The proponent must suppress dust on the Shute Harbour Marina site during construction and ensure no visible emission of dust beyond the Shute Harbour Marina boundary.

Condition 34.

The proponent must ensure that construction traffic uses Waterson Road to bypass does not travel between Airlie Beach and Shute Harbour between sunset and sunrise.

Condition 35.

The proponent must not replace or reinstall any swing moorings that are removed from Shute Bay for construction of the Shute Harbour Marina, unless they are of a design that minimises impacts to seagrass.

Condition 36.

The proponent must appoint a suitably qualified environmental professional to be onsite during all construction activities to ensure compliance with the conditions of approval. A monthly audit adequate to demonstrate levels of compliance with the conditions of approvals must be completed and certified by the environmental

professional and published in the proponent's website within 10 business days of the end of each calendar month and must remain there for at least one year.

Marine water quality

The Department of Environment and Heritage Protection has jurisdiction for the following conditions:

Condition 37.

- (a) After at least twelve months of implementation of the REMP, as required under Conditions 17-21, the proponent must set discharge criteria for relevant parameters, against which future discharges from Shute Harbour Marina to Shute Bay must be monitored. The discharge criteria must be:
- (i) developed with reference to Queensland Water Quality Guidelines Environmental Protection (Water) Policy 2009 (Proserpine River, Whitsunday Island and O'Connell River Basins Environmental Values and Water Quality Objectives) (DEHP 2013), and
 - (ii) approved by the administering authority/Department of Environment and Heritage Protection prior to commencement of construction.

Condition 38.

The proponent must not discharge, irrigate or otherwise release potable water, wastewater, stormwater, harvested water, bilge water or sewage effluent into Shute Bay unless the discharge complies with discharge criteria defined for the site and approved by the administering authority/Department of Environment and Heritage Protection.

Condition 39.

Acid sulfate soils or potential acid sulfate soils encountered during construction must be managed in accordance with the Queensland Government's Instructions for the Treatment and management of acid sulfate soils, 2001.

Condition 40.

Structural components of the Shute Harbour Marina in contact with marine waters are to be non-biodegradable and are not to be treated with toxic compounds (including but not limited to copper chrome arsenic) or anti fouling agents such as Tributyltin (TBT).

Condition 41.

An Erosion and Sediment Control Plan (ESCP) must be developed by an appropriately qualified person and implemented for all stages of the Shute Harbour Marina to minimise to the greatest extent possible erosion and the release of sediment to receiving waters and contamination of stormwater. The ESCP must be developed in accordance with Best Practice Erosion & Sediment Control (IECA 2008).

Condition 42.

The proponent must ensure that maintenance and cleaning of any vessels, vehicles, plant or equipment within Shute Harbour Marina is not carried out in areas from which contaminants can be released into any receiving waters.

Dredge material rehandling

The Department of Environment and Heritage Protection has jurisdiction for the following conditions:

Condition 43.

- (a) A dredge material rehandling facility must be included in the Shute Harbour Marina site generally in accordance with the Development Plan SEIS P64 (November 2013). The facility must be designed and operated to:
- (i) facilitate the dewatering and regular removal of dredge material from the Shute Harbour Marina, considering the relevant climatic factors such as rainfall
 - (ii) have sufficient capacity to accept anticipated maintenance dredging volumes, including a contingency for storm related channel siltation
 - (iii) ensure that all water discharged from the facility meets discharge criteria as developed and approved under Condition 37
 - (iv) minimise impacts on visual amenity
 - (v) minimise the release of noxious offensive odours or emissions of dust and/or particulate matter
 - (vi) not be inundated by a storm tide event up to and including the 1% Annual Exceedance Probability, and
 - (vii) ensure public safety.

Condition 44.

A dredge material rehandling facility design report must be submitted with an application for a development permit for operational works for the proposed reclamation. The design report must provide sufficient detail to demonstrate that the above requirements will be achieved, including adequate monitoring and adaptive management measures to detect and respond to non-compliances.

Condition 45.

The proponent must monitor discharge water quality during the initial geotube dredge material management event in reference to discharge criteria developed and approved by the administering authority/Department of Environment and Heritage Protection as required under Condition 37. Results of this monitoring must be published on the proponent's website within three months of the completion of the initial geotube dredge material management event and maintained for the life of the project. The proponent must demonstrate in the annual report, as required under Condition 63, that where geotube dredge material management releases do not comply with discharge criteria, adaptive management measures are implemented to prevent future non-compliances.

Stormwater

The Whitsunday Regional Council has jurisdiction for the following conditions:

Condition 46.

- (a) Stormwater from the development site must be managed to avoid any contamination of marine waters. Stormwater systems must be designed to:
- (i) comply with the Urban Stormwater Quality Planning Guidelines 2010 (Department of Environment and Heritage Protection), the State Planning Policy Environment and Heritage Interests (December 2013)
 - (ii) not exceed background discharge criteria established under Condition 37, and
 - (iii) stormwater treatment systems must be constructed and maintained so that all runoff is filtered prior to discharge into waterways.

Condition 47.

The stormwater designs and runoff assessment must be submitted to the Department of Environment and Heritage Protection and approved by the Whitsunday Regional Council as part of any application for a development permit for operational works, as applicable.

Condition 48.

The proponent must monitor stormwater releases to Shute Bay for, but not limited to, turbidity and TSS, nutrients, metals and metalloids and results must be published in the annual report required under Condition 63. The proponent must demonstrate in the annual report that where stormwater releases do not comply with background water quality criteria, adaptive management measures are implemented to prevent future non-compliances.

Seagrass

The Department of Agriculture, Fisheries and Forestry has jurisdiction for the following conditions:

Condition 49.

The proponent must undertake seagrass surveys within the Shute Harbour Marina site and within 500 metres of the Shute Harbour Marina site to identify the total area and density of seagrass in this area in the month of November and not more than 18 months prior to commencement of construction. The proponent must report the results of the seagrass survey to the Department of Agriculture, Fisheries and Forestry and include a statement of the measured extent of seagrass within the project area (in ha).

Condition 50.

The proponent must undertake seagrass monitoring in the area within 500 metres of the Shute Harbour Marina annually from the commencement of construction and for 5 years after construction is completed for the duration of the action. After this period, monitoring must be undertaken once every 10 years. Monitoring effort must be sufficient to detect changes in area and density of seagrass within 500 metres of Shute Harbour Marina but not be limited to undertaking seagrass surveys in the month of November. Reference sites must be identified and monitored concurrently. Results of each monitoring event must be reviewed by an independent expert prior to finalisation and must be published on the proponent's website within three months of each

monitoring event, and must remain available for the duration of the action. The proponent must develop contingency/offset measures which must be approved by the administering authority in writing prior to commencement of construction, and must be implemented within 12 months of an observed decline/degradation of seagrass that may be attributable to the construction and/or operation of Shute Harbour Marina.

Contingency plan for emergency environmental incidents

The Department of Environment and Heritage Protection has jurisdiction for the following conditions:

Condition 51.

The proponent must develop and submit a Contingency Plan for Emergency Environmental Incidents as part of any application for a development permit for operational works. The plan must be published on the proponent's website and must remain available for the duration of the operation of the Shute Harbour Marina.

Condition 52.

- (a) The Contingency Plan for Emergency Environmental Incidents must include but not necessarily be limited to:
- (i) a clear definition of what constitutes an Emergency Environmental Incident or near miss
 - (ii) identification of the types of emergency environmental incidents that may occur, including, but not limited to, fuel/oil spills, turbidity plumes within Shute Bay and injury/mortality of marine megafauna
 - (iii) response procedures to minimise the extent and duration of environmental harm caused by environmental emergency incidents
 - (iv) the resources to be used in response to environmental emergency incidents
 - (v) procedures to investigate the cause of any incidents including releases or near misses, and where necessary, the remedial actions to be implemented to reduce the likelihood of recurrence of similar events
 - (vi) the practices and procedures to be employed to restore the environment or mitigate any environmental harm caused
 - (vii) procedures for accessing monitoring locations during emergency environmental incidents
 - (viii) communication procedures and lines of communication within and beyond the organisation, (including Local Government) to be employed in responding to environmental emergency incidents
 - (ix) training of staff that will be called upon to respond to emergency environmental incidents to enable them to respond effectively
 - (x) timely and accurate reporting of the circumstances and nature of emergency environmental incidents to the administering authority and Council
 - (xi) dispersion modelling to be implemented for any spill of environmentally hazardous materials that has the potential to cause adverse impacts

beyond the site boundary, including the capacity to provide a report on the dispersion modelling to the administering authority and other emergency services agencies within twenty-four (24) hours of the incident occurring, and

- (xii) contingency plans for managing water used to fight fires to the extent that all firewater is managed so as to avoid contamination of marine waters.

Condition 53.

- (a) The Contingency Plan for Emergency Environmental Incidents must ensure that any incidents concerning the spillage, discharge, or flushing of fuels, oils or oil mixtures are immediately reported to
 - (i) the Regional Harbour Master
 - (ii) the Australian Maritime Safety Authority
 - (iii) the Great Barrier Reef Coast Marine Park managing agency, and
 - (iv) Great Barrier Reef Marine Park Authority (GBRMPA) where impacts extend into the Great Barrier Reef Marine Park.

Condition 54.

- (a) Within five (5) days of an Emergency Environmental Incident the proponent must publish on their website a report detailing:
 - (i) the cause of the release
 - (ii) mechanisms to manage the cause of the release
 - (iii) the reliability of the proposed mechanism to ensure the release does not continue
 - (iv) alternative proposed measures, if the identified mechanisms do not address the cause of the release and the timeframe for implementation of these measures
 - (v) adaptive management measures to be undertaken and implemented to ensure release/s do not occur again, and
 - (vi) details of the physical and chemical properties of the release, including total estimated volume and total estimated loads of nutrients and contaminants.

Condition 55.

The Contingency Plan for Emergency Environmental Incidents must provide sufficient assurance that any release of environmentally hazardous materials that has adverse impacts beyond the site boundary will be promptly and comprehensively cleaned up.

Condition 56.

- (a) A review of the Contingency Plan for Emergency Environmental Incidents must be submitted to the administering authority at the following minimum frequency:
 - (i) within twenty (20) business days of an event or an incident that has triggered the Contingency Plan for Emergency Environmental Incidents, and
 - (ii) at least once every one (1) year during construction and every five (5) years during operation of the Shute Harbour Marina.

Condition 57.

The proponent must make specified changes to the Contingency Plan for Environmental Incidents if directed to do so by the administering authority and must submit to that authority, a revised plan within 20 business days. The Contingency Plan for Emergency Environmental Incidents must be implemented for all stages of the project construction and operation.

Transport infrastructure

The Department of Transport and Main Roads has jurisdiction for the following conditions:

Condition 58.

The proponent must implement all impact mitigation measures necessary to avoid significant adverse impacts directly associated with the project on the safety, condition and efficiency of state-controlled and local roads for all stages of the project.

Condition 59.

- (a) An impact mitigation program must be implemented at least three (3) months prior to the commencement of project construction and must be one or more of the following:
 - (i) construction of any required works (including site accesses) as and when stated in a Road Impact Assessment (RIA)
 - (ii) payment of any contributions towards the cost of works or maintenance as and when stated in a RIA
 - (iii) undertake or implement any other action as and when stated in a Road Use Management Plan (RMP), and
 - (iv) actions or payments as otherwise agreed in writing with DTMR and/or the relevant LGA^{28[1]}, for example, in an infrastructure agreement.

Road impact assessments

An acceptable road impact assessment (RIA) must be developed by a person who is a Registered Professional Engineer of Queensland and in accordance with the DTMR Guidelines for Assessment of Road impacts of Development (2006) (GARID)^{29[2]} and includes:

- (a) a completed DTMR 'Transport Generation proforma'^{30[3]} detailing project-related traffic and transport generation information or as otherwise agreed in writing with DTMR and the relevant LGA
- (b) use of DTMR's Pavement Impact Assessment tools^{31[4]} or such other method or tools as agreed in writing with DTMR and the relevant LGA
- (c) clearly indicate if any detailed estimates of project related traffic and impacts are not available and document the assumptions and methodologies that have been

^{28[1]} For example, mitigation measures related to operational traffic (routes, hours of operation and the like) would not need to be implemented during the construction phase.

^{29[2]} Available at <http://www.tmr.qld.gov.au/business-industry/Technical-standards-publications.aspx>

^{30[3]} Available from Planning Management Branch, Brisbane.

^{31[4]} Available from TMR Regional Offices.

previously agreed in writing with DTMR and relevant LGA, prior to RIA finalisation, and

- (d) detail of the final impact mitigation proposals, listing infrastructure-based mitigation strategies, including contributions to road works, rehabilitation and maintenance and summarising key road-use management strategies and programs.

The RIA should be submitted to DTMR and/or the relevant LGA for review six (6) months prior to the anticipated commencement of the project, or the relevant project stage.

Road use management plans

An acceptable road-use management plan (RMP) must be developed by a person who is a Registered Professional Engineer of Queensland in accordance with DTMR's Guide to Preparing a Road-use Management Plan^{32[5]} for each stage of the project and includes:

- (a) project logistics planning that details how the proponent will minimise road-based trips on all state-controlled and local roads, and
- (b) a table^{33[6]} listing RMP commitments and providing confirmation that all works and road-use management measures have been designed and will be undertaken in accordance with all relevant DTMR standards, manuals and practices^{34[7]}.

The RMP should be submitted to DTMR and/or the relevant LGA for review six (6) months prior to the anticipated commencement of the project, or the relevant project stage.

Infrastructure agreements

To formalise arrangements about transport infrastructure works, contributions and road-use management strategies detailed and required under the impact mitigation program, the proponent must enter into infrastructure agreements with DTMR and the relevant LGA.

The infrastructure agreement/s should identify all required works and contributions, and incorporate the following:

- (a) project-specific works and contributions required to upgrade impacted road infrastructure and vehicular access to project sites as a result of the proponent's use of state-controlled and local roads by project traffic
- (b) project-specific contributions towards the cost of maintenance and rehabilitation to mitigate impacts on state-controlled and/or local road pavements and other infrastructure
- (c) infrastructure works and contributions associated with shared use of state-controlled and local road infrastructure with other projects subject to an EIS

^{32[5]} Available from TMR Regional Offices or Planning Management Branch, Brisbane.

^{33[6]} Available from TMR Regional Offices or Planning Management Branch, Brisbane.

^{34[7]} Available at: <http://www.tmr.qld.gov.au/business-industry/Technical-standards-publications.aspx>

- (d) performance criteria that detail protocols for consultation about, reviewing and updating of project-related traffic assessments and impact mitigation measures that are based on actual traffic volumes and impacts, should previously advised traffic volumes and/or impacts change, and
- (e) the proponent's undertaking to fulfil all commitments as detailed in the 'Table for listing RMP commitments'.

Any infrastructure agreement between the proponent, DTMR and the relevant LGA should be in place three (3) months prior to commencement of project construction, or as otherwise agreed in writing between the proponent, DTMR and the relevant LGA.

Permits, approvals and traffic management plans

To ensure efficient processing of the project's required transport-related permits and approvals, the proponent should, no later than three (3) months, prior to the commencement of significant construction works or project-related traffic:

- (a) submit detailed drawings of any works required to mitigate the impacts of project-related traffic for DTMR and the relevant LGA review and approval
- (b) obtain all relevant licenses and permits required under the Transport Infrastructure Act 1994 for works within the state-controlled road corridor (s33 for road works approval, s62 for approval of location of vehicular accesses to state roads and s50 for any structures or activities to be located or carried out in a state-controlled road corridor)
- (c) prepare a Heavy Vehicle Haulage Management Plan and obtain permits for any excess mass or over-dimensional loads for all phases of the project in consultation with DTMR's Heavy Vehicles Road Operation Program Office, the Queensland Police Service and the relevant LGA as required by the *Transport Operations (Road Use Management) Act 1995*, and
- (d) prepare Traffic Management Plan/s (TMP) in accordance with DTMR's Guide to preparing a Traffic Management Plan^{35[8]}. A TMP must be prepared and implemented during the construction and commissioning of each site where road works are to be undertaken, including site access points, road intersections or other works undertaken in the state-controlled road corridor.

Condition 60.

The proponent must provide parking for all activities associated with the construction and operation of the marina including bus lay down areas.

Condition 61.

To ensure the safety of marine traffic associated with the proposed development, the proponent must provide and install all necessary additional navigational aids and an effective vessel traffic separation scheme along the whole of the north east channel from Low Rock to the marina entrance channel to the satisfaction of the Regional Harbour Master (Mackay) and Maritime Safety Queensland. Maintenance of the navigational aids is the responsibility of Maritime Safety Queensland.

^{35[8]} Available from TMR Regional Offices of Planning Management Branch, Brisbane.

Condition 62.

- (a) The proponent must consult with the Regional Harbour Master (Mackay) and Maritime Safety Queensland on:
- (i) the timing of replacement of swing moorings and the number to be relocated
 - (ii) the location and management of the proposed mooring area for recreational boat users
 - (iii) the approval of the location, construction and the maintenance plans for the marina access channel
 - (iv) the location of required navigational aids, and
 - (v) the provision of an attenuator pontoon to mitigate the impact of large waves across the entrance to the marina in preparation for a cyclone.

Reporting

The Whitsunday Regional Council has jurisdiction for the following conditions:

Condition 63.

The proponent must publish a report on their website annually, starting within one year of the Coordinator-General's signing of this report. The report must describe how the proponent has implemented the conditions, including the outcomes of implementation of conditions and any non-conformances with and breaches of conditions. Reports must remain available on the proponent's website for the duration of the approval. Conditions to be attached to a preliminary operational works approval under the *Sustainable Planning Act 2009*.

Appendix 2. Conditions to be attached to a preliminary operational works approval under the *Sustainable Planning Act 2009*

Schedule 1. Operational Works—Dredging

CONDITIONS FOR A PRELIMINARY DEVELOPMENT APPROVAL UNDER THE SUSTAINABLE PLANNING ACT 2009 FOR OPERATIONAL WORKS THAT ARE TIDAL WORKS (DREDGING) FOR THE MARINA AND ACCESS CHANNEL.

The recommended assessing authority for these conditions is the Department of Environment and Heritage Protection.

Condition 1.

Development approval under the *Sustainable Planning Act 2009* for operational works that are tidal works or prescribed tidal works associated with dredging for the access channel, shall be a preliminary approval

Condition 2.

The boundary and depth of areas to be dredged for the marina and access channel will be generally in accordance with Revision 4 of the supplementary environmental impact statement for the Shute Harbour Marina project.

Condition 3.

Dredged depths in the entrance channel are not to exceed –4.0 m LAT

Condition 4.

- (a) Detailed design plans certified by a Registered Professional Engineer of Queensland must be provided in support of an application for a development permit for operational works (tidal works) and must include:
- (i) the boundaries of the land to be dredged;
 - (ii) any sand banks;
 - (iii) the foreshore; and
 - (iv) the line of high-water mark

Condition 5.

The water quality objectives relevant to potentially affected marine ecosystems shall be defined based on at least 12 months of water quality data (including but not limited to turbidity and TSS, nutrients, metals and metalloids), having regard to the *Environmental Protection (Water) Policy 2009 (Proserpine River, Whitsunday Island and O'Connell River Basins Environmental Values and Water Quality Objectives) (DEHP 2013)* or most current version of these guidelines and must be submitted to the administering authority in support of an application for a development approval

Condition 6.

Dredging of the marina basin must only be undertaken in a fully contained, dewatered environment.

Condition 7.

Dredging of the access channel must only be carried out using a cutter-suction dredge.

Condition 8.

Acid sulfate soils or potential acid sulfate soils encountered during construction must be managed in accordance with the Queensland Government's Instructions for the Treatment and management of acid sulfate soils, 2001 (or a later version if it becomes available).

Condition 9.

Dredging operations will be fully enclosed by fixed sediment curtains and/or revetment walls at all times in order to prevent the release of sediment to waters outside the boundary of the activities. Additional sediment curtains must be implemented where these measures are ineffective.

Condition 10.

All material dredged for the marina and access channel will be retained within the project site or disposed to a land-based licensed receiving facility.

Condition 11.

- (a) A dredge management plan must :
- (i) be provided in support of an application for development permit for operational works (tidal works involving dredging) and
 - (ii) be submitted to and approved by the Department of Environment and Heritage Protection prior to commencement.

Condition 12.

- (a) The dredge management plan must include, but not be limited to:
- (i) detailed plans showing the extent and depth of dredging
 - (ii) a hydrographic survey of that land below tidal and subtidal waters on lines not more than 20 metres apart
 - (iii) the location(s) of placement of capital and maintenance dredge material, estimated volumes, and details of material containment and dewatering system(s) design, including engineering certification of containment system design
 - (iv) management strategies and defined actions to ensure that impacts on marine fauna are minimised
 - (v) alternative disposal options for capital and maintenance dredge material that may contain contaminants as defined in the National Assessment Guidelines for Dredging (NAGD) (DEWHA 2009)
 - (vi) mapping showing the estimated extent of water quality change, including but not limited to total suspended sediment (TSS) and turbidity, as a result of dredging and dredge material disposal activities

- (vii) the potential impact of changed water quality on marine ecosystems, especially seagrass and coral communities, defined in terms of level of impact (high, medium, and low with associated definition) based on the intensity, duration and frequency of adverse water quality conditions
- (viii) management strategies and defined actions to ensure that impacts on water quality and dependent marine ecosystems are minimised to the greatest extent possible
- (ix) dredge material drain water discharge locations, volumes, water quality monitoring parameters and discharge limits (including but not limited to pH, turbidity, TSS and metals/metalloids)
- (x) monitoring locations, water quality parameters and triggers/limits to be applied to inform management of dredging and limit impacts to marine ecosystems outside the project boundary.

Condition 13.

All dredged areas are to be maintained in proper operational condition until their decommissioning.

Condition 14.

Hydrographic surveys of the navigable areas within the entrance channel and marina basin must be conducted at a frequency of at least once every five years and made publicly available.

Condition 15.

The minimum depths in navigable areas within the entrance channel and marina basin must be maintained to between –2.5 m and –4.093 m LAT.

Condition 16.

Material to be removed as part of maintenance dredging will be assessed for contaminants in accordance with the National Assessment Guidelines for Dredging (NAGD) (DEWHA 2009) or as approved by the assessing authority/Department of Environment and Heritage Protection within the 12 months preceding planned commencement of maintenance dredging.

Condition 17.

- (a) The proponent must:
 - (i) provide the results of the maintenance dredge material contaminant assessment to the assessing authority
 - (ii) publish the results on the proponent's web site at least one month prior to commencement and three years following maintenance dredging
 - (iii) include appropriate management measures to be implemented if contaminant levels exceed threshold levels identified in the guidelines.

Condition 18.

The proponent must dispose of all material from maintenance dredging to a land-based licensed receiving facility.

Schedule 2. Operational works—tidal works associated with the marina other than dredging for the marine and access channel

CONDITIONS FOR PRELIMINARY DEVELOPMENT APPROVAL UNDER THE SUSTAINABLE PLANNING ACT 2009 FOR OPERATIONAL WORKS THAT ARE TIDAL WORKS OR PRESCRIBED TIDAL WORKS ASSOCIATED WITH THE MARINA, OTHER THAN DREDGING FOR THE MARINA AND ACCESS CHANNEL.

The recommended assessing authority for these conditions is the Department of Environment and Heritage Protection.

Condition 1.

The location and design of the marina will be generally in accordance with Revision 4 of the supplementary environmental impact statement for the Shute Harbour Marina project.

Condition 2.

- (a) The following information will be provided in support of an application for a development permit for operational works (tidal works or prescribed tidal works other than dredging) associated with the marina:
 - (i) layout and cross sectional drawings (with engineering certification) of the marina, including levels relative to Australian Height Datum for reclamation/filling, and the entrance to the marina;
 - (ii) details of materials to be used in the revetment walls and reclamation; and
 - (iii) details of construction methodology and any temporary construction works.

Condition 3.

Construction activities below the limit of highest astronomical tide will be fully enclosed by fixed sediment curtains and/or revetment walls at all times in order to prevent the release of suspended sediments to waters outside the boundary of the construction activities.

Condition 4.

An underwater noise management plan must be provided in support of an application for a development permit, and implemented during construction works to minimise and mitigate any impacts to marine fauna through pile driving and construction activities.

Condition 5.

All pile driving must utilise a 'soft start' procedure, where piling force is increased from minimum force to piling force over a period of not less than three minutes.

Condition 6.

- (a) Any pile driving at times when the pile is partly or fully submerged in subtidal or tidal waters will be subject to at least the following measures to minimise the impact of underwater noise on marine fauna:

- (i) underwater noise impacts to marine fauna including cetaceans, dugongs and turtles must be minimised to the greatest extent practicable;
- (ii) underwater noise tests should be conducted for each specific piling rig prior to commencing operation to determine the distance from the rig at which the underwater noise level reduces to 183 dB (referenced to 1μ Pa².s). That distance plus 50 metres will be the observation distance. Results of noise tests must be verified by an independent third party underwater noise expert and published in the annual report required under Appendix 1. Condition 63 of the stated conditions;
- (iii) in the absence of underwater noise tests for each specific piling rig, the observation distance must be at least 500m from the pile driving works site;
- (iv) piling may only commence following an initial 30 minute observation period during which no cetaceans, dugongs and turtles are sighted by an appropriately qualified person within the observation distance (referenced (b) or (c)) of the pile driving works site;
- (v) an appropriately qualified person must be positioned in a suitable location to view the entire observation distance during all pile driving works, and must actively monitor the observation distance during all pile driving works;
- (vi) if during piling a sighting is made within the observation distance, piling must stop and not recommence until the cetaceans, dugongs and/or turtles are observed to travel beyond the observation distance or a 30 minute period has passed since any cetacean, dugong or turtle was last seen by an appropriately qualified person within the observation distance of the pile driving work site
- (vii) in the absence of the noise tests required in Condition 6a(ii) underwater noise from pile driving must be recorded at a distance not greater than 500m from the pile driving work site, and continually monitored to ensure that noise is below acceptable limits as specified in an underwater noise management plan. If the noise is recorded above 183 dB (referenced to 1μ Pa².s), pile driving must cease until a revised observation distance is implemented in accordance with Condition 6a(ii)
- (viii) the proponent must not undertake pile driving at night or if the full observation distance is not clearly visible to the appropriately qualified person undertaking observations.

Condition 7.

- (a) All noise monitoring and recording required under these conditions must include, but not be limited to:
 - (i) effects due to any extraneous factors such as marine traffic noise;
 - (ii) location, date and time of monitoring
 - (iii) underwater sound level pressure level during pile driving activities as dB (referenced to 1μ Pa².s).

Appendix 3. Conditions to be attached to a development approval for the commencement of environmentally relevant activities

Schedule 1. ERA 16—Extractive and screening activities (dredging)

CONDITIONS FOR PRELIMINARY DEVELOPMENT APPROVAL UNDER THE *SUSTAINABLE PLANNING ACT 2009* FOR MATERIAL CHANGE OF USE INVOLVING ENVIRONMENTALLY RELEVANT ACTIVITY (ERA) 16—EXTRACTIVE AND SCREENING ACTIVITIES (DREDGING).

The recommended assessing authority for these conditions is the Department of Environment and Heritage Protection.

Condition 1.

This approval is granted for the environmentally relevant activity of dredging for the purpose of construction, operation and maintenance of lawful structures associated with Shute Harbour Marina.

Condition 2.

Dredging activities must not be conducted outside of the area defined as ‘development site’ and ‘access channel’ in the Development Plan SEIS P64 (November 2013) of the supplementary environmental impact statement for the Shute Harbour Marina project

Condition 3.

- (a) Any dredging conducted under this approval must:
- (i) comply with a dredge management plan (DMP) approved by the assessing authority/Department of Environment and Heritage Protection prior to commencement of the activity;
 - (ii) be consistent with the National Assessment Guidelines for Dredging (NAGD, 2009); and
 - (iii) be consistent with the Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland (EPA, 1998).

Condition 4.

The final placement of capital dredge material must occur within the reclamation area defined by Revision 4 of the supplementary environmental impact statement for the Shute Harbour Marina project.

Condition 5.

Dredge material from maintenance dredging of the marina and access channel will be disposed of on a land-based licensed receiving facility.

Condition 6.

If during dredging of the marina access, cetaceans, dugongs and/or turtles are observed, within the 100 metres (the observation distance) of the dredging activity, dredging must stop and not recommence until the cetaceans, dugongs and/or turtles are observed to travel beyond the observation distance or a 30 minute period has passed since any cetacean, dugong or turtle was last seen by an appropriately qualified person within the observation distance of the dredging work site.

Condition 7.

Noise resulting from the activity must not cause an environmental nuisance in any nuisance sensitive place.

Appendix 4. Coordinator-General's recommendations

This appendix includes general recommendations, made under section 35(4) of the SDPWO Act. The recommendations relate to any application for development approval for the project.

While the recommendations guide the assessment managers³⁶ in assessing the development applications, they do not limit their ability to seek additional information or impose conditions on any development approval required for the project.

Each recommendation nominates the entity to be consulted by the proponent.

Schedule 1. Natural hazards mitigation under the *Sustainable Planning Act 2009*

Recommendation 1. Mitigating the adverse impacts of bushfire and landslide

The entity responsible for this recommendation is the Department of State Development, Infrastructure and Planning.

To mitigate the adverse risk of bushfire and landslide, the proponent will adequately investigate the risk of bushfire and landslide according to the State Planning Policy (SPP). If medium and/or high bushfire hazard is present, the proponent must address these requirements for buildings and structures.

Schedule 2. General recommendations

The recommendations below are general recommendations. While the recommendations guide the administering authorities in assessing the applications, they do not limit their ability to either seek additional information to impose conditions on any approval required for the project.

Recommendation 2. Indigenous employment

The entity responsible for this recommendation is the Department of Aboriginal and Torres Strait Islander and Multicultural Affairs.

- (a) The proponent will develop Aboriginal and Torres Strait Islander employment strategies and targets for both the construction and operations phases of the Shute Harbour Marina project. These strategies will be developed prior to the commencement of construction. The strategies developed will cover opportunities across the SHM project as a whole, including:
 - (i) construction,
 - (ii) operation of the broader SHM, and
 - (iii) operation of the Indigenous Cultural Centre.

³⁶ For a definition of 'assessment manager' refer to the Glossary on page 200 of this report.

Recommendation 3. Post-assessment report/pre-construction liaison with DTMR

The entity responsible for this recommendation is the Department of Transport and Main Roads.

- (a) Once the Assessment Report is finalised for the Shute Harbour Marina project and the proponent decides to proceed with the project, the proponent should contact the Manager (Project Planning and Corridor Management) or his delegate of the DTMR Mackay/Whitsunday Regional Office, no later than nine (9) months prior to the commencement of significant construction works, to liaise over the finalisation of the road impact assessment (RIA), road-use management plan (RMP) and traffic management plan (TMP) for any works in a State-controlled road (SCR) reserve.

Appendix 5. Commitments register

Number	Commitment
C1	The proponent will obtain all permits necessary to comply with relevant federal, state and local laws applicable to the development.
Ecological sustainable development	
C2	The design, planning and operation of the development will be aligned with the principles of ecologically sustainable development.
Construction	
C3	Staging construction to successfully manage impacts on areas of conservation significance surrounding the site by reducing the land disturbance at any one time and reducing the potential for erosion and sedimentation.
C4	Conducting regular monitoring and auditing of the site and the activities throughout the construction stages and implementing corrective actions as a result of these monitoring and auditing programs, in order to meet specified performance objectives.
C5	A works plan will be prepared specifically for site establishment and marina development including reclamation and dredging which addresses the requirements of the approved engineered drawings and documents identified in section 4.3.2 of the August 2008 EIS and section 7 of this SEIS report and the CEMP.
C6	All reasonable measures will be undertaken to notify the local community of the nature, duration and program of construction works.
C7	All necessary measures will be implemented to control impacts related to construction, including erosion and sediment control, water quality management, traffic, noise, dust, cultural heritage and impacts on flora and fauna. These measures are specified in detail in the Construction Environmental Management Plan.
C8	<p>Measures have been specifically nominated to manage maintenance dredging works with an emphasis on water quality monitoring for the protection and enhancement of areas of conservation significance surrounding the site and the ongoing establishment of ecological communities within the marina basin. These measures include:</p> <ul style="list-style-type: none"> • Dredging works are to be managed by the use of silt curtains and/or other appropriate mitigation devices to minimise turbidity plumes. • Maintenance and operation of all dredging equipment shall occur according to • manufacturer's specifications to ensure no discharge of dredge spoil to the surrounding water environment and accidental release of contaminants. • A limit on the rate of the dredge pump shall be imposed to ensure that discharge is not excessive into the spoil disposal area which could increase the water velocity and in turn increase the potential for uncontrolled runoff. • Tailwater release points from the dredge spoil disposal area must be established and affixed with sediment control devices. • Scheduling of maintenance dredging between April and October. • During dredging of the access channel the Dredge Contractor shall ensure that all dredge equipment, including for example barges, anchor buoys and floats are clearly marked to be visible during the hours of daylight and night identified with omni-directional yellow flashing lights. • The Dredge Contractor shall ensure that a clear navigation channel is maintained at all times during the dredging operation. • The Dredge Contractor shall provide temporary navigation markers to guide vessels around the work area to provide safe navigation. • Any other navigational requirements of the Regional Harbour Master must be implemented. • A marine incident report must be completed in the event of damage to boats or

Number	Commitment
	personal injury within the marina or following an incident where there was a risk of damage to boats or personal injury.
C10	Any replacement of swing moorings to be with environmentally sensitive moorings designed to impact less on the marine environment, particularly seagrasses.
C11	Moorings will be lit with low-impact lighting to minimise nocturnal impacts on marine vertebrates.
Land	
C12	Provision of generous landscape buffers along Shute Harbour Road between the commercial areas of the marina and the existing motel.
C13	Staging of construction to vary the use of noisy plant and equipment so as to provide periods of minimal impact, and construction times limited to 12 hours per day during daylight only (except during dredging of the marina).
C14	Provision of a managed mooring area for recreational boat users.
C15	Major earthworks to be undertaken in the drier months of the year from April to December.
C16	Maintenance spoil will be dewatered in Geobags on the western artificial headland designed for this purpose with a sand filter, prior to it being transported for on-land disposal.
C17	Design of runoff control measures specifically for areas of proposed ASS disturbance, stockpiling and treatment so that runoff and overland flow can be adequately captured, contained, treated and monitored prior to release and is completely separate from other drainage control/management systems.
C18	Acid Sulfate Soils field testing will be undertaken as part of the construction methodology to identify ASS and to confirm that soils excavated and used for fill have sufficient neutralising capacity such that soils do not require treatment and management as per the ASSMP.
C19	All ASS will be identified, treated and managed during works in accordance with the Acid Sulfate Soil Management Plan (ASSMP) attached to the EIS.
Traffic	
C20	Upgrade to the section of Shute Harbour Road adjacent to the development incorporating a realignment, a new design surface, 2 metre shoulders and median strip with kerbing, dedicated area for future possible road widening to three lanes, new culverts for drainage and grassed swale stormwater drains.
C21	Construction Traffic Management Plans (CTMP) shall be prepared when a contractor is appointed and will depend on final construction methodology and staging. This CTMP is expected to form part of the development approval conditions and will include details of: <ul style="list-style-type: none"> • site access • the volume, composition (types and quantities), origin of • goods to be moved including construction and raw materials • anticipated times at which oversize movements may occur • details of oversize indivisible loads (including types and composition) • the proposed transport routes • increased road maintenance • barge operations.
Climate	
C22	Flood mitigation measures designed into the proposed development.
C23	Shute Harbour Road upgrade will be designed to have 100 year ARI flood immunity and

Number	Commitment
	to divert hill-slope run-off around the SHM site into Shute Bay.
C24	A Cyclone Evacuation Plan has been prepared that identifies precyclone tasks and responsibilities of each individual in relation to a cyclone, and the emergency evacuation points that should be used in the event of a cyclone occurring.
Water resources	
C25	Implementation of erosion and sediment control measures to ensure materials that may contaminate watercourses and the marine environment are not released to any waters in a direct or indirect manner or unmanaged on land as a result of construction activities.
C26	Appropriate on-site storage of construction materials and wastes, such as chemicals, paints, and petroleum products, shall be provided and maintained so as to ensure no uncontrolled release to the surrounding environment.
C27	Implementation of measures identified in the Stormwater Management Plan to ensure that pollutant loads and median concentrations in stormwater runoff from the site meet the required objectives.
Coastal processes	
C28	Dewatering of capital dredge spoil on the development site will occur through a series of settlement ponds and tailwater treatment basins to ensure any discharge of water is of a sufficient quality to prevent environmental harm
C29	As far as practicable, excavation of the marina basin will occur in the dry, following installation of temporary sheet piling, and during capital dredging of the area of the marina basin that cannot be excavated in the dry, dredging shall only occur within a fully enclosed marina basin with the breakwater acting as a physical barrier to the potential release of suspended sediment (i.e. dredge plume) and double silt curtains acting as a barrier across the access channel. In addition a comprehensive water quality monitoring program before, during and after construction will be implemented.
C30	Dredging during both the construction and operation of the proposed SHM will be managed by best practice methods available including silt curtains and an extensive water quality monitoring program.
C31	A Reef Conservation Fund will be provided including an initial capital sum and ongoing funding raised through levies, to provide for the conservation of ecological values of adjacent areas and contribute towards educational programs and facilities.
C32	New coastal-dependent land uses will be developed as part of the marina, including a public marina and access for the public to the foreshore within the project area which were previously denied to the public.
C33	Protection of Shute Bay waters from waste releases through Waste Management Plans specifically prepared for both the construction and operational phases of the marina.
C34	Potential impacts on water quality from stormwater runoff will be managed principally by a stormwater strategy as recommend in the Stormwater Management Plan.
C36	Minimal loss of natural habitat through refinement of the marina design and orientation following coastal processes studies to avoid changes to coastal processes.
C37	The development will ensure biological diversity of the marina footprint is encouraged and avoid adverse impacts on the biological diversity of the surrounding sensitive environments.
C38	The potential detrimental impact on water quality will be minimised through management of coastal resources and their values (including coastal processes).
Air quality	
C39	The emission of air impurities associated with construction works will be minimised, and appropriate methods employed to minimise dust nuisance.

Number	Commitment
Waste	
C40	In order to reduce waste volumes, where possible, all wastes generated from construction and operational activities will be reused on site or sent to recyclers. Disposal to appropriately licensed waste facilities will only be undertaken where reuse or recycling is not possible or feasible.
C41	Contracts for marina berths, storage and mooring agreement will contain conditions relating to nil release policy from vessels into waters of the marina. The Marina Manager will ensure the Agreement is formally completed, explained to the customer and a customer copy is issued.
C42	No waste material will be released from the site in an uncontrolled manner causing environmental harm.
C43	The safe storage, handling and disposal of dangerous or hazardous materials within the construction site will be effectively managed.
Noise and vibration	
C44	Noise and vibration generated by construction activities will be controlled and the impact minimised to ensure acceptable levels of amenity at the closest sensitive receptors.
Nature conservation	
C45	No development will take place to the north of Shute Harbour Road.
C46	Monitoring of the rock-wallaby mortality rates will be undertaken and contribution provided to mitigation measures (within the first five years of the development) in the case rock-wallaby mortality is experienced.
C47	Weeds will be managed by ensuring all fill is obtained from approved locations and is bare of all vegetative and seed matter reducing the chance of the introduction of any other weeds to the area.
C48	Mosquitoes will be controlled through design of the SHM by avoiding the creation of breeding habitat.
C49	The SHM design incorporates fish friendly structures to increase the habitat complexity within the marina footprint.
C50	Provision of offsets or financial compensation for marine plant loss as required.
C51	Adverse impact to marine megafauna within the locality will be avoided during construction and maintenance dredging works by the implementation of water quality controls, the relocation of megafauna from the marina prior to any dredging works, and ongoing visual monitoring for megafauna during dredging.
C52	Impose controls on keeping and handling cats and dogs within the project development to reduce potential interactions of these domestic pets and Proserpine rock-wallabies.
C53	Use native plant species to landscape the development that are unlikely to be toxic to the Proserpine rock-wallaby.
C54	Install fences, if required, to restrict rock-wallabies from entering the project site.
Cultural heritage	
C55	The Cultural Heritage Management Plan will be adhered to at all times during construction and operations.
Social	
C56	Potential labour force impacts will be addressed by encouraging the use of the local labour pool.
C57	The resort will incorporate bus set down facilities encouraging enhanced public transport between Shute Harbour and Airlie Beach,

Number	Commitment
C58	Encourage the use of Marina recreational facilities by local community.
C59	Engaging and consulting with the community during the planning, construction and operational stages of the development and incorporating covenants will ensure that second stage development is in accordance with the vernacular of the region and expressed local values.
C60	Committing to implement a Cultural Heritage Management Plan to prevent any adverse impacts on Indigenous and non-Indigenous matters.
Health and safety	
C61	Upgrades to Shute Harbour Road and heavy vehicles accessing the project site will be managed to minimise the risk of harm to motorists and pedestrians.
C62	Construction and associated building works will be undertaken in a manner that maximises the aesthetic appeal of the surrounding environment and is sympathetic to the residential and business needs of the Airlie Beach, Cannonvale and Shute Harbour townships and local tourist population.
Economic	
C63	Facilitating opportunities for local businesses to capitalise on the benefits of the project.
C64	Retaining as much construction expenditure as possible in the regional economy by facilitation of discussion with local businesses to establish which services are available in the region, encouraging local suppliers to tailor their services to better meet the requirements of the developer and encouraging the primary contractor to utilise local suppliers, where possible in the development of the facility.
Maritime safety	
C65	Enforce vessel speed limits in Shute Harbour through a three strike policy, where vessels observed to be exceeding the speed limit on three occasions will have their berthing privileges removed and the vessel operator will be asked to leave the marina. A register of offenders will be maintained.
C66	Promote best practice environmental management measures for boating to marina users. Provide information to marina berth applicants, presentations conducted by DEHP and GBRMPA and emphasise best practice in monthly newsletters to marina users.

Appendix 6. Statement of Outstanding Universal Value of the Great Barrier Reef

Brief synthesis

As the world's most extensive coral reef ecosystem, the Great Barrier Reef (GBR) is a globally outstanding and significant entity. Practically the entire ecosystem was inscribed as World Heritage in 1981, covering an area of 348 000 km² and extending across a contiguous latitudinal range of 14° (10°X to 24°S). The Great Barrier Reef (hereafter referred to as GBR) includes extensive cross-shelf diversity, stretching from the low water mark along the mainland coast up to 250 km offshore. This wide depth range includes vast shallow inshore areas, mid-shelf and outer reefs, and beyond the continental shelf to oceanic waters over 2000 metres deep.

Within the GBR there are some 2500 individual reefs of varying sizes and shapes, and over 900 islands, ranging from small sandy cays and larger vegetated cays, to large rugged continental islands rising, in one instance, over 1100 metres above sea level. Collectively these landscapes and seascapes provide some of the most spectacular maritime scenery in the world.

The latitudinal and cross-shelf diversity, combined with diversity through the depths of the water column, encompasses a globally unique array of ecological communities, habitats and species. This diversity of species and habitats, and their interconnectivity, make the GBR one of the richest and most complex natural ecosystems on earth. There are over 1,500 species of fish, about 400 species of coral, 4,000 species of mollusk, and some 240 species of birds, plus a great diversity of sponges, anemones, marine worms, crustaceans, and other species. No other World Heritage property contains such biodiversity. This diversity, especially the endemic species, means the GBR is of enormous scientific and intrinsic importance, and it also contains a significant number of threatened species. At time of inscription, the IUCN evaluation stated "...if only one coral reef site in the world were to be chosen for the World Heritage List, the Great Barrier Reef is the site to be chosen".

Criterion (vii): The GBR is of superlative natural beauty above and below the water, and provides some of the most spectacular scenery on earth. It is one of a few living structures visible from space, appearing as a complex string of reefal structures along Australia's northeast coast.

From the air, the vast mosaic patterns of reefs, islands and coral cays produce an unparalleled aerial panorama of seascapes comprising diverse shapes and sizes. The Whitsunday Islands provide a magnificent vista of green vegetated islands and spectacular sandy beaches spread over azure waters. This contrasts with the vast mangrove forests in Hinchinbrook Channel, and the rugged vegetated mountains and lush rainforest gullies that are periodically cloud-covered on Hinchinbrook Island.

On many of the cays there are spectacular and globally important breeding colonies of seabirds and marine turtles, and Raine Island is the world's largest green turtle

breeding area. On some continental islands, large aggregations of over-wintering butterflies periodically occur.

Beneath the ocean surface, there is an abundance and diversity of shapes, sizes and colours; for example, spectacular coral assemblages of hard and soft corals, and thousands of species of reef fish provide a myriad of brilliant colours, shapes and sizes. The internationally renowned Cod Hole near Lizard Island is one of many significant tourist attractions. Other superlative natural phenomena include the annual coral spawning, migrating whales, nesting turtles, and significant spawning aggregations of many fish species.

Criterion (viii): The GBR, extending 2000 km along Queensland's coast, is a globally outstanding example of an ecosystem that has evolved over millennia. The area has been exposed and flooded by at least four glacial and interglacial cycles, and over the past 15,000 years reefs have grown on the continental shelf.

During glacial periods, sea levels dropped, exposing the reefs as flat-topped hills of eroded limestone. Large rivers meandered between these hills and the coastline extended further east. During interglacial periods, rising sea levels caused the formation of continental islands, coral cays and new phases of coral growth. This environmental history can be seen in cores of old massive corals.

Today the GBR forms the world's largest coral reef ecosystem, ranging from inshore fringing reefs to mid-shelf reefs, and exposed outer reefs, including examples of all stages of reef development. The processes of geological and geomorphological evolution are well represented, linking continental islands, coral cays and reefs. The varied seascapes and landscapes that occur today have been moulded by changing climates and sea levels, and the erosive power of wind and water, over long time periods.

One-third of the GBR lies beyond the seaward edge of the shallower reefs; this area comprises continental slope and deep oceanic waters and abyssal plains.

Criterion (ix): The globally significant diversity of reef and island morphologies reflects ongoing geomorphic, oceanographic and environmental processes. The complex cross-shelf, longshore and vertical connectivity is influenced by dynamic oceanic currents and ongoing ecological processes such as upwellings, larval dispersal and migration.

Ongoing erosion and accretion of coral reefs, sand banks and coral cays combine with similar processes along the coast and around continental islands. Extensive beds of *Halimeda* algae represent active calcification and accretion over thousands of years.

Biologically the unique diversity of the GBR reflects the maturity of an ecosystem that has evolved over millennia; evidence exists for the evolution of hard corals and other fauna. Globally significant marine faunal groups include over 4,000 species of molluscs, over 1,500 species of fish, plus a great diversity of sponges, anemones, marine worms, crustaceans, and many others. The establishment of vegetation on the cays and continental islands exemplifies the important role of birds, such as the Pied Imperial Pigeon, in processes such as seed dispersal and plant colonisation.

Human interaction with the natural environment is illustrated by strong ongoing links between Aboriginal and Torres Strait Islanders and their sea-country, and includes numerous shell deposits (middens) and fish traps, plus the application of story places and marine totems.

Criterion (x): The enormous size and diversity of the GBR means it is one of the richest and most complex natural ecosystems on earth, and one of the most significant for biodiversity conservation. The amazing diversity supports tens of thousands of marine and terrestrial species, many of which are of global conservation significance.

As the world's most complex expanse of coral reefs, the reefs contain some 400 species of corals in 60 genera. There are also large ecologically important inter-reefal areas. The shallower marine areas support half the world's diversity of mangroves and many seagrass species. The waters also provide major feeding grounds for one of the world's largest populations of the threatened dugong. At least 30 species of whales and dolphins occur here, and it is a significant area for humpback whale calving.

Six of the world's seven species of marine turtle occur in the GBR. As well as the world's largest green turtle breeding site at Raine Island, the GBR also includes many regionally important marine turtle rookeries.

Some 242 species of birds have been recorded in the GBR. Twenty-two seabird species breed on cays and some continental islands, and some of these breeding sites are globally significant; other seabird species also utilize the area. The continental islands support thousands of plant species, while the coral cays also have their own distinct flora and fauna.

Integrity

The ecological integrity of the GBR is enhanced by the unparalleled size and current good state of conservation across the property. At the time of inscription it was felt that to include virtually the entire Great Barrier Reef within the property was the only way to ensure the integrity of the coral reef ecosystems in all their diversity.

A number of natural pressures occur, including cyclones, crown-of-thorns starfish outbreaks, and sudden large influxes of freshwater from extreme weather events. As well there is a range of human uses such as tourism, shipping and coastal developments including ports.

There are also some disturbances facing the GBR that are legacies of past actions prior to the inscription of the property on the World Heritage list.

At the scale of the GBR ecosystem, most habitats or species groups have the capacity to recover from disturbance or withstand ongoing pressures. The property is largely intact and includes the fullest possible representation of marine ecological, physical and chemical processes from the coast to the deep abyssal waters enabling the key interdependent elements to exist in their natural relationships.

Some of the key ecological, physical and chemical processes that are essential for the long-term conservation of the marine and island ecosystems and their associated biodiversity occur outside the boundaries of the property and thus effective conservation programs are essential across the adjoining catchments, marine and coastal zones.

Protection and management requirements

The GBR covers approximately 348 000 km². Most of the property lies within the GBR Marine Park: at 344 400 km², this Federal Marine Park comprises approximately 99 per cent of the property. The GBR Marine Park's legal jurisdiction ends at low water mark along the mainland (with the exception of port areas) and around islands (with the exception of 70 Commonwealth managed islands which are part of the Marine Park). In addition the GBR also includes over 900 islands within the jurisdiction of Queensland, about half of which are declared as 'national parks', and the internal waters of Queensland that occur within the World Heritage boundary (including a number of long-established port areas).

The World Heritage property is and has always been managed as a multiple-use area. Uses include a range of commercial and recreational activities. The management of such a large and iconic world heritage property is made more complex due to the overlapping State and Federal jurisdictions. The Great Barrier Reef Marine Park Authority, an independent Australian Government agency, is responsible for protection and management of the GBR Marine Park. *The Great Barrier Reef Marine Park Act 1975* was amended in 2007 and 2008, and now provides for "the long term protection and conservation... of the Great Barrier Reef region" with specific mention of meeting "...Australia's responsibilities under the World Heritage Convention."

Queensland is responsible for management of the Great Barrier Reef Coast Marine Park, established under the *Marine Parks Act 2004* (Qld). This is contiguous with the GBR Marine Park and covers the area between low and high water marks and many of the waters within the jurisdictional limits of Queensland. Queensland is also responsible for management of most of the islands.

The overlapping jurisdictional arrangements mean that the importance of complementary legislation and complementary management of islands and the surrounding waters is well recognised by both governments. Strong cooperative partnerships and formal agreements exist between the Australian Government and the Queensland Government. In addition, strong relationships have been built between governments and commercial and recreational industries, research institutions and universities. Collectively this provides a comprehensive management influence over a much wider context than just the marine areas and islands.

Development and land use activities in coastal and water catchments adjacent to the property also have a fundamental and critical influence on the values within the property. The Queensland Government is responsible for natural resource management and land use planning for the islands, coast and hinterland adjacent to the GBR. Other Queensland and Federal legislation also protects the property's Outstanding Universal Value addressing such matters as water quality, shipping management, sea dumping, fisheries management and environmental protection.

The EPBC Act provides an overarching mechanism for protecting the World Heritage values from inappropriate development, including actions taken inside or outside which could impact on its heritage values. This requires any development proposals to undergo rigorous environmental impact assessment processes, often including public consultation, after which the Federal Minister may decide, to approve, reject or approve

under conditions designed to mitigate any significant impacts. A recent amendment to the EPBC Act makes the GBR Marine Park an additional 'trigger' for a matter of National Environmental Significance which provides additional protection for the values within the GBR.

The GBR Marine Park and the adjoining GBR Coast Marine Park are zoned to allow for a wide range of reasonable uses while ensuring overall protection, with conservation being the primary aim. The zoning spectrum provides for increasing levels of protection for the 'core conservation areas' which comprise the 115 000 km² of 'no-take' and 'no-entry' zones within the GBR.

While the Zoning Plan is the 'cornerstone' of management and provides a spatial basis for determining where many activities can occur, zoning is only one of many spatial management tools and policies applied to collectively protect the GBR. Some activities are better managed using other spatial and temporal management tools like Plans of Management, Special Management Areas, Agreements with Traditional Owners and permits (often tied to specific zones or smaller areas within zones, but providing a detailed level of management not possible by zoning alone). These statutory instruments also protect the Outstanding Universal Value of the property.

Many Aboriginal and Torres Strait Island peoples undertake traditional use of marine resource activities to provide traditional food, practice their living maritime culture, and to educate younger generations about traditional and cultural rules and protocols. In the GBR these activities are managed under both Federal and Queensland legislation and policies including Traditional Use of Marine Resource Agreements (TUMRAs) and Indigenous Land Use Agreements (ILUAs). These currently cover some 30 per cent of the GBR inshore area, and support Traditional Owners to maintain cultural connections with their sea country.

Similarly non-statutory tools like site management and Industry Codes of Practice contribute to the protection of World Heritage values. Some spatial management tools are not permanently in place nor appear as part of the zoning, yet achieve effective protection for elements of biodiversity (e.g. the temporal closures that are legislated across the GBR prohibit all reef fishing during specific moon phases when reef fish are spawning).

Other key initiatives providing increased protection for the GBR include the comprehensive Great Barrier Reef Outlook Report, (and its resulting 5-yearly reporting process); the Reef Water Quality Protection Plan; the GBR Climate Change Action Plan; and the Reef Guardians Stewardship Programs which involve building relationships and working closely with those who use and rely on the GBR or its catchment for their recreation or their business.

The 2009 Outlook Report identified the long-term challenges facing the GBR; these are dominated by climate change over the next few decades. The extent and persistence of damage to the GBR ecosystem will depend to a large degree on the amount of change in the world's climate and on the resilience of the GBR ecosystem to such change. This report also identified continued declining water quality from land-based sources, loss of coastal habitats from coastal development, and some impacts from

fishing, illegal fishing and poaching as the other priority issues requiring management attention for the long-term protection of the GBR.

Emerging issues since the 2009 Outlook Report include proposed port expansions, increases in shipping activity, coastal development and intensification and changes in land use within the GBR catchment; population growth; the impacts from marine debris; illegal activities; and extreme weather events including floods and cyclones.

Further building the resilience of the GBR by improving water quality, reducing the loss of coastal habitats and increasing knowledge about fishing and its effects and encouraging modified practices, will give the GBR its best chance of adapting to and recovering from the threats ahead, including the impacts of a changing climate.

Appendix 7. Threat abatement plans and species recovery plans

The following threat abatement plans and recovery plans relate to matters of national environmental significance as discussed in Section 7 of this report.

Schedule 1. Threat abatement plans

Part A. Fox Threat Abatement Plan

The goal of the Fox TAP is to minimise the impact of foxes on biodiversity in Australia and its territories. The five main objectives and associated recovery actions in order to achieve this goal are as follows:

- (1) Prevent foxes occupying new areas in Australia and eradicate foxes from high-conservation-value 'islands' by;
 - (a) collating data on offshore islands and developing and implementing management plans to prevent, monitor, contain and eradicate and fox incursions.
- (2) Promote the maintenance and recovery of native species and ecological communities that are affected by fox predation by;
 - (a) identifying priority areas for fox control and conducting and monitoring regional fox control in these areas
 - (b) applying incentives to promote and maintain on private or lease hold land within or adjacent to priority areas.
- (3) Improve knowledge and understanding of fox impacts and interactions with other species and other ecological processes by:
 - (a) developing simple and cost effective methods for monitoring populations and impacts of foxes
 - (b) investigating interactions between foxes and native carnivores
 - (c) determining the nature of interactions between foxes and other pest animals
 - (d) identifying unintended effects of fox control conducted in isolation
 - (e) estimating the environmental and other costs of impacts from foxes.
- (4) Improve the effectiveness, target specificity, integration and humaneness of control options for foxes by:
 - (a) conducting further work on the development of new, or improvements to existing control techniques
 - (b) investigating feasibility of control techniques to target foxes and not dingos in some areas
 - (c) developing training programs to assist land owners control foxes
 - (d) ensuring habitat rehabilitation and management of potential prey, competitors and predators of foxes are considered in fox control programs
 - (e) continuing to promote procedures for the humane management of foxes.

- (5) Increase awareness of all stakeholders of the objectives and actions of this threat abatement plan, and of the need to control and manage foxes by:
 - (a) promoting understanding of the threat to biodiversity posed by foxes and support for their control, including the use of humane and best-practice cost-effective controls.

Part B. Feral Cat Threat Abatement Plan

The goal of the Cat TAP is to minimise the impact of cats on biodiversity in Australia and its territories. The Proserpine rock-wallaby is listed as a species of concern under this TAP. The five main objectives and associated recovery actions in order to achieve this goal are as follows:

- (1) Prevent feral cats occupying new areas in Australia and eradicate feral cats from high- conservation-value 'islands' by:
 - (a) collating data on offshore islands and developing and implementing management plans to prevent, monitor, contain and eradicate any cat incursions;
 - (b) working with communities to prevent incursion; and
 - (c) monitoring native prey species in areas eradicated of cats.
- (2) Promote the maintenance and recovery of native species and ecological communities that are affected by feral cat predation by:
 - (a) identifying priority areas for cat control and conducting and monitoring regional cat control in these areas; and
 - (b) applying incentives to promote and maintain on private or lease hold land within or adjacent to priority areas.
- (3) Improve knowledge and understanding of feral cat impacts and interactions with other species and other ecological processes by:
 - (a) developing simple and cost effective methods for monitoring populations and impacts of foxes;
 - (b) investigating interactions between foxes and native carnivores;
 - (c) determining the nature of interactions between foxes and other pest animals;
 - (d) determining impacts of cat-borne diseases; and
 - (e) identifying unintended effects of fox control conducted in isolation.
- (4) Improve effectiveness, target specificity, humaneness and integration of control options for feral cats by:
 - (a) developing an effective toxin-bait for cats;
 - (b) determining appropriate baiting strategies;
 - (c) ensuring habitat rehabilitation and management of potential prey;
 - (d) testing and disseminating information on exclusion fence designs regarding cost-effectiveness; and
 - (e) continuing to promote the adoption and adaptation of model codes of practice and standard operating procedures for the humane management of feral cats.

- (5) Increase awareness of all stakeholders of the objectives and actions of the TAP, and of the need to control and manage feral cats by:
 - (a) promoting understanding of the threat to biodiversity posed by feral cats and support for their control, including the use of humane and best-practice cost-effective controls; and
 - (b) developing communication campaigns to accompany the release of new broadscale cat control techniques.

Part C. Feral Pig Threat Abatement Plan

The Pig TAP sets out a national framework to guide the coordinated implementation of the objectives and actions considered necessary to manage the environmental damage caused by feral pigs to species and ecological communities affected by the process. The five main objectives and associated recovery actions in order to achieve this goal are as follows:

- (1) To prevent feral pigs from establishing in areas where they currently do not occur or are in low eradicable numbers, and where they are likely to pose a threat to biodiversity, especially where they would impact on nationally listed threatened species and ecological communities by:
 - (a) identifying areas currently free from feral pigs or where they are eradicable
 - (b) verifying presence or absence of feral pigs in priority areas and developing and implementing management strategies to remove feral pigs from priority areas
 - (c) providing awareness programs to recreational hunters, bushwalkers and land managers
 - (d) reviewing the adequacy and effectiveness of existing legislation.
- (2) To integrate feral pig management plans and their implementation into natural resource planning and investment at the regional, state and territory, and national level through consultation and liaison with key stakeholders by:
- (3) coordination between the department and relevant state and territory agencies to set out key concerns and issues to be included in Natural Resource management plans and to establish protocols and use funding and other relevant mechanisms to improve the consistency and coordination of actions across tenures and jurisdictions.
- (4) To increase awareness and understanding of land managers and the general community about the damage that feral pigs cause and management options by:
 - (a) assessing the adequacy of available information and dissemination of appropriate material to target groups
 - (b) supporting the completion, dissemination and adoption of the pest management component of the Conservation and Land Management Training Package being developed by the National Training Authority.
- (5) To quantify the impacts feral pigs have on biodiversity (especially nationally listed threatened species and ecological communities) and determine the relationship between feral pig density and the level of damage by:
 - (a) identifying priority areas under threat by feral pigs

- (b) developing and implementing appropriate studies that aim to determine the impact of feral pigs on listed species and the level of control required to reduce the impact to a significant level.
- (6) To improve the effectiveness, efficiency and humaneness of techniques and strategies for managing the environmental damage due to feral pigs by:
 - (a) assessing the need for the development of more effective and humane techniques and strategies when managing feral pigs
 - (b) assessing these techniques and strategies through an analysis of costs and benefits, safety, potential impact on non-target species, legal issues and any other practical considerations, and formulate a regional best practice approach.

Part D. Marine Debris Threat Abatement Plan

The aim of the Marine Debris TAP is to provide a coordinated national approach to the implementation of measures to prevent and mitigate the impacts of harmful marine debris on vertebrate marine life. The four main objectives and associated recovery actions in order to achieve this goal are as follows:

- (1) Contribute to the long-term prevention of the incidence of harmful marine debris by;
 - (a) improving waste management practices on land and at sea through collaboration between, state, territory and Australian Governments, industry, non-government organisations and Indigenous communities;
 - (b) state and territory governments considering to review legislation to ensure that details of waste reception facilities for ships are included in port environment plans; and
 - (c) state and territory governments to investigate how Australia's obligations under MARPOL (International Convention for the Prevention of Pollution from Ships) (i.e. to provide adequate waste reception facilities for ship waste) are encompassed in domestic legislation and policies.
- (2) Remove existing harmful marine debris from the marine environment and monitor the quantities, origins and impacts of marine debris and assess the effectiveness of management arrangements over time for the strategic reduction in marine debris by:
 - (a) development of a national approach to information collection and management; and
 - (b) improvement of the understanding of the origins of harmful marine debris.
- (3) mitigate the impacts of harmful marine debris on marine species and ecological communities by:
 - (a) facilitating implementation of wildlife research; and
 - (b) identifying measures to promote the use of biodegradable and oxodegradable plastic in marine-based industries.

Schedule 2. Species Recovery Plans

Part A. Recovery plan for marine turtles in Australia—July 2003

The overall recovery objective of the Marine Turtle Recovery Plan (for the Green, Flatback, Leatherback, Olive Ridley, Loggerhead and Hawksbill Turtle species) is to reduce detrimental impacts on Australian populations of marine turtles and hence promote their recovery in the wild. The Marine Turtle Recovery Plan noted the continued decline of the eastern Australian population of the Loggerhead Turtle and identified the need for its conservation to be implicit in all actions. The specific objectives, and a summary of their recovery actions, identified in the Marine Turtle Recovery Plan are as follows:

- (1) To reduce the mortality of marine turtles and, where appropriate, increase natural survivorship, including through developing management strategies with Aboriginal and Torres Strait Islander communities for the sustainable use of marine turtles by:
 - (a) reducing bycatch of marine turtles in fisheries;
 - (b) facilitating sustainable harvesting of turtles and eggs by Aboriginal and Torres Strait Islander people;
 - (c) reducing levels of marine debris;
 - (d) reducing mortality of marine turtles during shark control activities;
 - (e) reducing incidences of boat strike on marine turtles;
 - (f) reducing lighting impacts and entanglement incidences from Pearl Farming and other Aquaculture activities; and
 - (g) reducing potential impacts from Department of Defence activities.
- (2) To develop programs and protocols to monitor marine turtle populations in Australia, assess the size and status of those populations, the causes of their mortality and address information gaps by:
 - (a) monitoring key populations and strandings of marine turtles;
 - (b) measuring recovery; and
 - (c) facilitating the genetic identification of Australian marine turtle populations and their ecology.
- (3) To manage factors that affect marine turtle nesting by:
 - (a) reducing light pollution in the marine environment;
 - (b) ensuring minimal impacts on turtle habitat (including nesting beaches) from tourism and recreational activities;
 - (c) managing vehicle access to nesting beaches; and
 - (d) minimising faunal predation of marine turtle eggs.
- (4) To identify and protect habitats that are critical for the survival of marine turtles by:
 - (a) ensuring that activities impacting land use and water quality on or in proximity to marine turtle habitat are subject to an environmental impact assessment and the development of best practice coastal management guidelines across Queensland;

- (b) protecting critical marine turtle benthic and seagrass habitats;
 - (c) managing of oil spills and operational discharges by lead agencies and appropriate environmental assessment of related activities; and
 - (d) ensuring soft start procedures are implemented in seismic surveys and monitoring literature on the effect of noise on marine turtles.
- (5) To communicate the results of recovery actions and involve and educate stakeholders by:
- (a) reviewing the Marine Turtle Recovery Plan and evaluating its effectiveness;
 - (b) raising awareness and involvement of the community; and
 - (c) raising awareness in northern Australian Indigenous communities.
- (6) To support and maintain existing agreements and develop new collaborative programs with neighbouring countries for the conservation of shared turtle populations by:
- (a) the Commonwealth Government maintaining existing and developing new bilateral or multilateral agreements to ensure that international conservation and management of marine turtles is consistent with domestic policies and international treaty obligations.

Part B. Humpback Whale Recovery Plan 2005-2015

The overall objective of the *Humpback Whale Recover Plan 2005-2015* (DEH, 2005c) (Humpback Whale Recovery Plan) (provided for your consideration at [Annexure 1](#)) is to outline the measures necessary to ensure recovery of the Australian populations of Humpback Whales. The specific objectives, and a summary of their recovery actions, identified in the Humpback Whale Recovery Plan are as follows:

- the objectives are:
 - the recovery of populations of humpback whales utilising Australian waters so that the species can be considered secure in the wild
 - a distribution of humpback whales utilising Australian waters that is similar to the pre-exploitation distribution of the species
 - to maintain the protection of humpback whales from human threats.
- the actions are:
 - implement a program to measure population abundance, trends and recovery for Australian populations
 - implement a program to better define the characteristics (spatial, temporal and physical) of calving, resting, feeding and migratory areas
 - prevent commercial whaling and move to ban scientific whaling
 - protect habitat important to the survival of the species
 - monitor and manage the potential impacts of prey depletion due to over harvesting
 - monitor climate and oceanographic change.

Part C. National recovery plan for the Proserpine rock-wallaby

The overall recovery objective of the National recovery plan for the Proserpine rock-wallaby is to improve the conservation status of the species through habitat protection, reducing threats to species and increasing public participation in recovery activities. The specific objectives and a summary of their recovery actions, identified in the recovery plan are as follows:

- (1) To maintain and protect known habitat and ensure that the species continues to exist in the wild by:
 - (a) continuing monitoring known Proserpine rock-wallaby populations to determine presence or absence and colony condition
 - (b) identify, map and monitor colony refuge sites
 - (c) update Proserpine rock-wallaby habitat mapping in accordance with changes to regional ecosystem classification
 - (d) promote the conservation and management of Proserpine rock-wallaby habitat off park estate through voluntary conservation agreements, council open space habitat areas and management of covenant areas
 - (e) avoid or minimise further fragmentation within or between Proserpine rock-wallaby habitat.
- (2) To maintain and monitor the population of Proserpine rock-wallabies on Hayman Island by:
 - (a) monitoring the introduced Hayman Island colony to assess its genetic diversity and manage the population's genetics
 - (b) conducting surveys on Hayman Island to estimate the population and examine the age structure
 - (c) maintaining appropriate fire management procedures on Hayman Island
 - (d) conducting vegetation surveys on Hayman Island
 - (e) developing a plan to document management of the population on Hayman Island over the next five years
- (3) To minimise disease, incidental kills and other threatening processes (such as weeds) on populations by:
 - (a) continuing to implement actions to reduce the incidence of road mortality
 - (b) supporting implementation of Whitsunday Regional Council's Rural Feral and Stray Cat management Plan and dog registration program
 - (c) conducting an education program on the incidence and effects of hydatids in the Proserpine rock-wallaby population
 - (d) identifying, monitoring and managing habitat areas threatened by grazing, weeds or fire
 - (e) developing and implementing weed control strategies on Gloucester Island
 - (f) continuing to encourage the replacement of toxic plants with native plants
- (4) Improve understanding of Proserpine rock-wallaby ecology and threats to its survival by:

- (a) determining home ranges for colonies in close proximity to residential expansion
 - (b) mapping the distribution of *Toxoplasmosis gondii* and *hydatidosis* in the Proserpine rock-wallaby population
 - (c) studying the interactions between the Proserpine rock-wallaby and the unadorned rock-wallaby where populations are adjacent
- (5) Ensure recovery plan continues to operate with high levels of community participation by:
- (a) promoting and facilitating community involvement in Proserpine rock-wallaby recovery.

Part D. National recovery plan for threatened albatrosses and giant petrels 2011-2016

The objective for the recovery plan is to ensure the long term survival and recovery of albatross and giant petrel populations breeding and foraging in Australian jurisdiction by reducing or eliminating human related threats at sea and on land by:

- (1) Researching and monitoring of the biology, ecology and population dynamics of albatrosses and giant petrels breeding within Australian jurisdiction is sufficient to understand conservation status and to implement effective and efficient conservation measures
- (2) Quantifying and reducing land based threats to the survival and breeding parameters of albatrosses and giant petrels breeding within areas under Australian jurisdiction
- (3) Quantifying and reducing marine based threats to the survival and breeding parameters of albatrosses and giant petrels foraging in waters under Australian jurisdiction
- (4) Educating fishers and promote public awareness of the threats to albatrosses and giant petrels
- (5) Achieving substantial progress towards global conservation of albatrosses and giant petrels in international conservation and fishing for a.

Part E. National recovery plan for the spectacled flying fox *Pteropus conspicillatus*

The overall objectives of recovery are to secure the long term protection of the spectacled flying fox through a reduction in the impact of threats to species' survival and to improve the standard of information available to guide recovery by:

- (1) Researching practicable and cost effective flying fox deterrent systems for commercial fruit growers by:
 - (a) Investigating the effectiveness and economic viability of non-lethal flying fox deterrent systems, including new applications for technology such as long wavelength lasers and intelligent systems for crop protection, and other innovative systems. Testing to be conducted at a range of sites within the species' range, and under varying conditions. The impact of such technology on impacts on flying fox behaviour in the vicinity of the deterrent systems should also be documented.

- (b) Investigating the feasibility of planting native food species (e.g. eucalyptus) for the spectacled flying-fox adjacent or near to orchards as an alternative food supply, and determine whether this is a viable means of mitigating the damage to orchard fruit crops.
 - (c) In partnership with all stakeholders, design and implement practicable methods to obtain robust quantitative data on:
 - (i) The nature and locality of commercial fruit industries impacted by the spectacled flying fox
 - (ii) Frequency, seasonality, degree of crop damage and other trends regarding impacts of flying foxes on fruit crops on an orchard by orchard basis
 - (iii) Aggregated industry-wide levels and trends of flying fox damage to commercial fruit crops
 - (d) Investigating the effectiveness of netting systems in terms of cyclone damage, deterioration by UV radiation, tear/chew resistance, materials used, type of netting system, and extent of crop coverage, period of installation of nets (e.g. permanent or seasonal), and level of bat deterrence provided.
- (2) Identifying and protecting native foraging habitat critical to the survival of the spectacled flying fox by:
- (a) Continuing telemetry studies of individuals from different camps, including Cape York Peninsula, to accurately identify and map key foraging areas and vegetation communities used by the spectacled flying fox through an annual cycle. Outcomes of these studies to be compared with data obtained from Action 1b regarding alternative food supplies adjacent to or near commercial fruit crops
 - (b) Building on the outcome of Action 2a, identifying opportunities to protect important foraging resources in native vegetation communities that are poorly represented within current reserves
 - (c) Building on the outcome of Action 2a, identifying opportunities to protect priority foraging habitats on private land using for example, voluntary conservation agreements such as the Queensland Department of Environment and Resource Management Nature Refuges Program.
- (3) Accurately assess the short and long term population size and population trends of the spectacled flying fox by:
- (a) Conducting monthly daytime counts of camps by experienced observers using standardised, readily repeatable methods, to derive an understanding of the variability of camp occupancy over time, including gender ratio, and the proportion of other flying fox species utilising these camps. Comparing these results with the data collection from daytime remote sensing activities (Action 2a)
 - (b) Conducting systematic surveys in known and potential *P. conspicillatus* habitat on Cape York Peninsula between October and December to locate and document maternity camps

- (c) Promoting participation in locating previously unrecorded spectacled flying fox camps, including on Cape York Peninsula
 - (d) Identifying the frequency of occupancy of satellite camps to provide the basis of forming a correction factor when making overall population estimates and investigating population trends
 - (e) Using outcomes of Actions 3a to 3d, determining whether changes in the southern extent of this species' range are occurring.
- (4) Improving the public perception of the spectacled flying fox and the standard of information available to guide recovery by:
- (a) Promoting understanding and awareness of the spectacled flying fox through field days, regular items in print, electronic, radio and television media regarding the role of the spectacled flying fox in the ecosystem and challenges for management, including techniques to minimise entanglements in backyard drape nets and barbed-wire fences
 - (b) Developing information packages for local government planners and other land managers aimed at encouraging protection of flying fox camps including through maintenance of appropriate buffer zones in proximity to permanent camps. Promoting the value of this approach to local councils, NRM regional groups, and other stakeholders. Including information on flying fox biology, issues of community concern such as noise and disease, and summaries of recent management experiences at flying fox camps. Ensuring all information aligns with the *Far North Queensland Regional Plan 2009-2031*.
 - (c) Commercial growers, Traditional owners and the community encouraged to participate in on-ground management actions for the protection of spectacled flying foxes.
 - (d) Continuing actions associated with the DERM policy on managing flying fox colonies in urban areas.
- (5) Increasing knowledge of *P. conspicillatus* roosting requirements and protecting important camps
- (a) Characterising roosts, including landscape features, aspect, whether within urban, peri-urban, rural or undeveloped landscape, microclimate, floristic composition, vegetation structure, distance to man-made objects including buildings and to utility/transport corridors, to provide a better understanding of roost locations and assist in the protection of potential habitat
 - (b) Identify camps critical to the survival of the spectacled flying fox and investigate the appropriateness of adopting the camp protection criteria used for the closely related grey-heading flying fox (Eby 2005):
 - (iv) Is used as a camp either continuously or seasonally in >50% of years
 - (v) Has been used as a camp at least once in the last ten years and is known to have contained >10 000 individuals, or
 - (vi) Has been used as a camp at least once in the last ten years and is known to have contained >5000 individuals, including reproductive

females during the final stages of pregnancy, lactation or the period of conception (i.e. September–May).

- (6) Improving understanding of incidence of tick paralysis and actions to minimise paralysis mortality in flying foxes by:
 - (a) Investigating environmental climatic and physiological conditions associated with the incidence of tick paralysis, including an investigation of the importance of wild tobacco and an assessment of whether tick paralysis in *P. conspicillatus* is limited to the Atherton Tableland.
- (7) Implementing strategies to reduce incidence of electrocution and entanglement of *P. conspicillatus* by:
 - (a) Promoting methods of protecting backyard fruit crops outlined in Saunders (2004) to minimise entanglement of flying foxes in backyard drape nets and investigate additional techniques to reduce mortality (Available at: http://www.epq.qld.gov.au/nature_conservation/wildlife/living_with_wildlife/flyingfoxes/netting_fruit_trees/ Accessed: 2009 05-06)
 - (b) Working together with landowners to increase the visibility of fences in areas where spectacled flying fox entanglements occur
 - (c) Encouraging landowners erecting new fences in north-eastern Queensland, particularly at the Wet Tropics region, to use plain wire on the top strand instead of barb-wire to reduce the incidence of flying fox entanglement
 - (d) Encouraging electricity suppliers to increase the spacing between individual wires on overhead transmission lines when replacing/upgrading infrastructure.
- (8) Investigating the causes of birth abnormalities such as cleft palate syndrome by:
 - (a) Assessing the impacts of birth abnormalities such as cleft palate syndrome on spectacled flying fox populations. Undertaking research to identify the likely causes of these abnormalities.

Part F. National recovery plan for the northern quoll

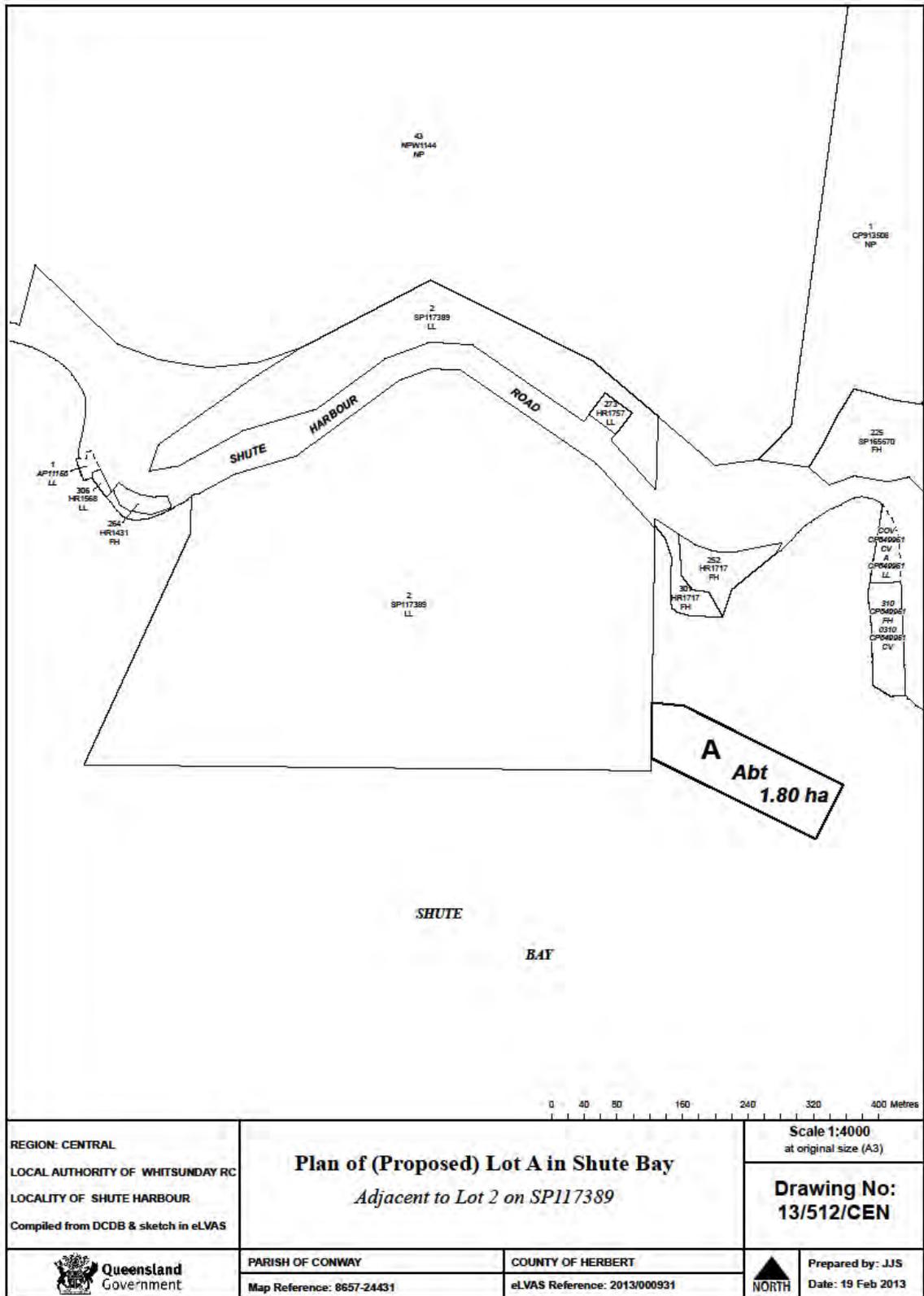
The overall objective of the plan is to minimise the rate of decline of the northern quoll in Australia, and ensure that viable populations remain in each of the major regions of distribution into the future by:

- (1) Protecting northern quoll populations on offshore islands from invasion and establishment of cane toads, cats and other potential invasive species by:
 - (a) Maintaining biosecurity of important offshore islands through quarantine invasion and establishment of cane toads, cats and other potential invasive species
 - (b) Monitoring offshore islands supporting quoll populations to detect the presence of cane toads, cats and any other potential invasive predator
 - (c) Developing and, where required, implementing a strategy for rapid-response control of cane toad or cat outbreaks on offshore islands occupied by northern quolls
- (2) Fostering the recovery of northern quoll sub-populations in areas where the species has survived alongside cane toads by:

- (a) Determining which factors affect survival and recovery of northern quolls in areas with cane toads
- (b) Using information from Action 2a to assist surviving populations to recover in sympatry with cane toads
- (c) Identify potential refuge habitats in Western Australia and the Northern Territory where quolls might be most likely to persist in the long term alongside cane toads
- (3) Halting northern quoll declines in areas not yet colonised by cane toads
 - (a) Collecting baseline data on population densities and monitor trends of quolls at a series of key sites not currently occupied by cane toads
 - (b) Investigating factors causing declines in northern quoll populations not yet affected by cane toads
 - (c) Managing key quoll populations in areas not currently affected by cane toads to halt population declines
 - (d) Identify the effect of pastoral land management practices on northern quoll persistence
 - (e) Interim fire management at potential key quoll populations
 - (f) Refine models of the current and expected distribution of cane toads and northern quolls, incorporating predictions of climate change
- (4) Halting declines in areas recently colonised by cane toads
 - (a) Continuing research into the susceptibility of quolls to cane toad poisoning
 - (b) Testing the efficacy of control measures for cane toads and whether they allow local persistence of quoll populations
- (5) Maintaining secure populations and source animals for future reintroductions/introductions, if they become appropriate by:
 - (a) Managing translocated populations of northern quolls on Astell and Pobassoo Islands
 - (b) NT and WA to maintain captive breeding population(s) or northern quolls
 - (c) Protection of key secure populations through protection of habitat in National Parks and Conservation Agreements
 - (d) NT and WA to determine the status of northern quolls on islands with suitable habitat and assess the potential for future translocations to these islands
- (6) Reducing the risk of northern quoll populations being impacted by disease by:
 - (a) Increasing knowledge and monitoring for disease in northern quoll populations
- (7) Reducing the impact of feral predators on northern quolls by:
 - (a) Assessing the impacts of feral predators on populations of northern quolls
 - (b) Implementing efforts to protect key northern quoll populations from the impacts of feral predators
- (8) Raising public awareness of the plight of northern quolls and the need for biosecurity of islands and WA by:

- (a) Developing new and promoting existing materials for educating the public on the need for quarantine measures at important island habitat for quolls and along major routes westward into Western Australia
- (b) Providing materials and support to Indigenous rangers and other groups responsible for habitat critical to the survival of northern quolls to educate their communities on the importance of cane toad and cat control and quarantine measures
- (c) Implementing a broader public education awareness campaign on quolls and feral species (particularly cane toads and cats)
- (d) Developing and implementing public education and awareness campaigns on land management threats to quolls.

Appendix 8. Plan of proposed Lot A



Plan of (Proposed) Lot A in Shute Bay

Acronyms and abbreviations

Acronym	Definition
μS/cm	microsiemens per centimetre
ABARE	Australian Bureau of Agricultural and Resource Economics
ACH Act	<i>Aboriginal Cultural Heritage Act 2003</i> (Qld)
AHD	Australian Height Datum
ANZECC	Australian and New Zealand Environment Conservation Council
AS/NZS	Australian Standard/New Zealand Standard
ASX	Australian Stock Exchange
BOE	barrels of oil equivalent
BOM	Board of Management
CAMBA	China–Australia Migratory Bird Agreement
CASA	Civil Aviation Safety Authority
CDMP	coal dust management plan
CEMP	construction environment management plan
CHMP	cultural heritage management plan
CIS	community investment strategy
CLMP	the coal loss management program for coal transport and coal dust emissions
CLR	Contaminated Land Register
CO ₂ -e	carbon dioxide equivalent
CSG	coal seam gas
dB(A)	decibels measured at the 'A' frequency weighting network
DEEDI	The former Department of Employment, Economic Development and Innovation
DERM	The former Department of Environment and Resource Management
DOC	Department of Communities (Qld)
DSDIP	Department of State Development, Infrastructure and Planning
DTMR	Department of Transport and Main Roads (Qld)
DSQ	Disability Services Queensland
EA	environmental authority
EIS	environmental impact statement
EMP	environmental management plan
EMR	Environmental Management Register
EP	equivalent persons
EP Act	<i>Environmental Protection Act 1994</i> (Qld)
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cwlth)
EPC	exploration permit for coal
EPP	Environmental Protection Policy (water, air, waste, noise)
EPP (Air)	Environmental Protection (Air) Policy 2008
EPP (Noise)	Environmental Protection (Noise) Policy 2008

Acronym	Definition
EPP (Water)	Environmental Protection (Water) Policy 2009
ERA	environmentally relevant activity
ESA	environmentally sensitive area
FID	financial investment decision
FIFO	fly-in fly-out
FSL	full supply level
FTE	full-time equivalent
GBRMP	Great Barrier Reef Marine Park
GBRMPA	Great Barrier Reef Marine Park Authority
GBRWHA	Great Barrier Reef World Heritage Area
GHG	greenhouse gas
GQAL	good quality agricultural land
HAT	Highest astronomical tide
IAS	initial advice statement
ICLR	independent community liaison representative
JAG	Queensland Department of Justice and Attorney-General
JAMBA	Japan–Australia Migratory Bird Agreement
kPa	kilopascal
L _{A1}	those noise levels that are exceeded for one per cent of each one-hour sample period
L _{Aeq}	the average A-weighted sound pressure level of a continuous steady sound that has the same mean square sound pressure as a sound level that varies with time
L _{Amax}	the maximum average A-weighted sound pressure measured over a specified period of time
LAN,T	statistical descriptor for the variation of noise
max L _{PZ,15 min}	the maximum value of the Z-weighted sound pressure level measured over 15 minutes
MCU	material change of use
mg/L	milligrams per litre of liquid/gaseous liquid
ML	megalitres
MNES	matters of national environmental significance
MOU	memorandum of understanding
MRA	<i>Mineral Resources Act 1989</i> (Qld)
mtpa	million tons per annum
NC Act	<i>Nature Conservation Act 1992</i> (Qld)
NEPC	National Environmental Protection Council
NEPM	national environment protection measure
NGA	National Greenhouse Accounts
NGAF	National Greenhouse Accounts Factors
NGOs	non-government organisations
NT agreement	native title agreement

Acronym	Definition
P&G Act	<i>Petroleum and Gas Act 2004</i> (Qld)
PM ₁₀	particulate matter with equivalent aerodynamic diameter less than 10µm
PM _{2.5}	particulate matter with equivalent aerodynamic diameter less than 2.5µm
PPV	peak particle velocity, which is a measure of ground vibration magnitude and is the maximum instantaneous particle velocity at a point during a given time interval in mms ⁻¹
QASSIT	Queensland Acid Sulfate Soils Investigation Team
QASSMAC	Queensland Acid Sulfate Soils Management Advisory Committee
QGEOP	Queensland Government Environmental Offsets Policy
QH	Queensland Health
QWC	Queensland Water Commission
QWQG	<i>Queensland Water Quality Guidelines</i>
RE	regional ecosystem
REDD	Regional Ecosystem Description Database
RIA	road impact assessment
RMP	road-use management plan
ROKAMBA	Republic of Korea–Australia Migratory Bird Agreement
SCL	strategic cropping land
SDA	state development area
SDPWO Act	<i>State Development and Public Works Organisation Act 1971</i> (Qld)
SDWPO Regulation	State Development and Public Works Organisation Regulation (Qld)
SEIS	supplementary environmental impact statement
SEWPaC	Australian Government Department of Sustainability, Environment, Water, Population and Communities
SHM	Shute Harbour Marina
SHMD	Shute Harbour Marina Developments Pty Ltd
SIA	social impact assessment
SIAU	Social Impact Assessment Unit
SIMP	social impact management plan
SLA	statistical local area
SPA	<i>Sustainable Planning Act 2009</i> (Qld)
SPP	state planning policy
TDS	total dissolved solids
TMP	traffic management plan
TOR	terms of reference
TSP	total suspended particles
VM Act	<i>Vegetation Management Act 1999</i> (Qld)
WMP	waste management plan
WRC	Whitsunday Regional Council
WRP	water resource plan

Glossary

Term	Definition
assessment manager	For an application for a development approval, means the assessment manager under the <i>Sustainable Planning Act 2009</i> (Qld).
bond	A bond, financial guarantee or similar arrangement, as approved by the Minister in writing
bilateral agreement	The agreement between the Australian and Queensland governments that accredits the State of Queensland's EIS process. It allows the Commonwealth Environment Minister to rely on specified environmental impact assessment processes of the state of Queensland in assessing actions under the <i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cwlth).
commencement of construction	Commencement of site preparation and clearing of vegetation, seismic and/or bathymetric surveying; earthworks, civil works, associated infrastructure (such as workshop, administration facilities, amenities facilities) and marine works. Construction does not include: <ul style="list-style-type: none"> • minor physical disturbance necessary to establish monitoring programs; or • activities that are critical to project activities that are associated with mobilisation of plant and equipment, materials, machinery and personnel prior to the start of development or construction only if such activities will have no adverse impact on MNES.
commercial occupation/ of the marina	Any time that one or more marina berths is owned or occupied by a third party.
construction is completed	Construction of buildings for the Shute Harbour Marina is completed.
construction areas	The construction worksites, construction car parks, and any areas licensed for construction or on which construction works are carried out.
controlled action	A proposed action that is likely to have a significant impact on a matter of national environmental significance; the environment of Commonwealth land (even if taken outside Commonwealth land); or the environment anywhere in the world (if the action is undertaken by the Commonwealth). Controlled actions must be approved under the controlling provisions of the <i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cwlth).
controlling provision	The matters of national environmental significance, under the <i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cwlth), that the proposed action may have a significant impact on.
coordinated project	A project declared as a 'coordinated project' under section 26 of the SDPWO Act. Formerly referred to as 'significant projects'.
Coordinator-General	The corporation sole constituted under section 8A of the <i>State Development and Public Works Organisation Act 1938</i> and preserved, continued in existence and constituted under section 8 of the SDPWO Act.

duration of the action	The period from the commencement of construction until the Shute Harbour Marina site is completely decommissioned and rehabilitated to its natural state.
environment	As defined in Schedule 2 of the SDPWO Act, includes: <ul style="list-style-type: none"> a) ecosystems and their constituent parts, including people and communities b) all natural and physical resources c) the qualities and characteristics of locations, places and areas, however large or small, that contribute to their biological diversity and integrity, intrinsic or attributed scientific value or interest, amenity, harmony and sense of community d) the social, economic, aesthetic and cultural conditions that affect, or are affected by, things mentioned in paragraphs (a) to (c).
environmental effects	Defined in Schedule 2 of the SDPWO Act as the effects of development on the environment, whether beneficial or detrimental.
environmental professional	A person suitably trained, qualified and experienced to oversee construction of the Shute Harbour Marina and identify non-compliance with these conditions of approval. This may include an environmental practitioner or a suitable officer from a state or commonwealth agency.
environmentally hazardous materials	Materials, including, but not limited to fuels, oils, chemicals and paints, that when released to the marine environment may negatively impact ecological values such as marine water quality, marine vegetation and marine species.
environmentally relevant activity (ERA)	An activity that has the potential to release contaminants into the environment. Environmentally relevant activities are defined in Part 3, section 18 of the <i>Environmental Protection Act 1994</i> (Qld).
flushing of water	The replacement of water within the marina basin through natural processes. 85% flushing of water within a 24 hour period would involve no more than 15% of water remaining within the marina for 24 hours.
Geotube dredge material management event	Any time that the geotube dredge material management facility is used to dewater and manage material dredged from the marina basin or access channel.
Impact	In Section 7 (MNES) of this report, impact has the same meaning as in section 527E of the <i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cwlth).
imposed condition	A condition imposed by the Queensland Coordinator-General under section 54B of the SDPWO Act. The Coordinator-General may nominate an entity that has jurisdiction for the condition.
Indigenous heritage values	In Section 7 (MNES) of this report, Indigenous heritage value has the same meaning as in section 528 of the <i>Environment Protection and Biodiversity Conservation Act (1999)</i> .
independent expert	A recognised expert in the relevant field, with demonstrated and documented qualifications and experience in relation to the matter for which they are appointed. The expert must not have been involved in the assessment of Shute Harbour Marina and must have no financial interest in the project.

independent peer review / independently peer reviewed	Assessment of the assumptions, calculations, extrapolations, alternate interpretations, methodologies, performance goals and performance criteria, and conclusions pertaining to the plan, strategy and/or program specified in these conditions by an independent peer reviewer.
independent peer reviewer	A person/organisation/technical committee, independent of the proponent and/or employed in any subsidiary company of the proponent. This person/organisation/technical committee must have demonstrated expertise in the protected matter (EPBC Act) being reviewed and be approved by the Cwlth Environment Minister prior to commencement of the review.
initial advice statement (IAS)	A scoping document, prepared by a proponent, that the Coordinator-General considers in declaring a coordinated project under Part 4 of the SDPWO Act. An IAS provides information about: <ul style="list-style-type: none"> • the proposed development • the current environment in the vicinity of the proposed project location • the anticipated effects of the proposed development on the existing environment • possible measures to mitigate adverse effects.
matters of national environmental significance	The matters of national environmental significance protected under the <i>Environment Protection and Biodiversity Conservation Act 1999</i> . The eight matters are: <ol style="list-style-type: none"> a) world heritage properties b) national heritage places c) wetlands of international importance (listed under the Ramsar Convention) d) listed threatened species and ecological communities e) migratory species protected under international agreements f) Commonwealth marine areas g) the Great Barrier Reef Marine Park h) nuclear actions (including uranium mines).
Minister	The Commonwealth Minister with administrative responsibility for the <i>Environment Protection and Biodiversity Conservation Act 1999</i> and includes a delegate of the Minister.
nominated entity (for an imposed condition for undertaking a project)	An entity nominated for the condition, under section 54B(3) of the SDPWO Act.
operational phase	The time between when construction is completed and when the Shute Harbour Marina site is completely decommissioned and rehabilitated to its natural state.
piling activity/ies	Driving one and/or multiple structural supports into the ground below the waterline.

properly made submission (for an EIS or a proposed change to a project)	Defined under section 24 of the SDPWO Act as a submission that: <ul style="list-style-type: none"> i) is made to the Coordinator-General in writing j) is received on or before the last day of the submission period k) is signed by each person who made the submission l) states the name and address of each person who made the submission m) states the grounds of the submission and the facts and circumstances relied on in support of the grounds.
proponent	The entity or person who proposes a coordinated project. It includes a person who, under an agreement or other arrangement with the person who is the existing proponent of the project, later proposes the project.
protected matters	A 'matter protected' as that term is defined in section 34 of the <i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cth)) by a provision of Part 3 of the EPBC Act for which this approval has effect.
publish/ed	A plan, program, strategy, independent peer review or other documentation as it relates to this approval that is made available on the proponent's website for the duration of the action (including decommissioning).
Reef Trust 2050	The Reef Trust created under the Reef 2050 plan.
Significant project	A project declared (prior to 21 December 2012) as a 'significant project' under section 26 of the SDPWO Act. Projects declared after 21 December 2012 are referred to as 'coordinated projects'.
soft start procedures	Initiated at the commencement of all marine piling activities by piling at low energy levels and then build up to full impact force. The first five impacts from the piling activity must be at no more than 50% of full hammer weight (e.g. a hammer with an adjustable stroke height of 0.6 metres at least 5 times during a 'soft start procedure), to encourage animals to move away from subsequent blows.
stated condition	Conditions stated (but not enforced by) the Coordinator-General under sections 39, 45, 47C, 49, 49B and 49E of the SDPWO Act. The Coordinator-General may state conditions that must be attached to a: <ul style="list-style-type: none"> • development approval under the <i>Sustainable Planning Act 2009</i> • proposed mining lease under the <i>Mineral Resources Act 1989</i> • draft environmental authority (mining lease) under Chapter 5 of the <i>Environmental Protection Act 1994</i> (EPA) • proposed petroleum lease, pipeline licence or petroleum facility licence under the <i>Petroleum and Gas (Production and Safety) Act 2004</i> • non-code compliant environmental authority (petroleum activities) under Chapter 4A of the EPA.
upward light spill	The projection of light at an angle above horizontal.

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