RTA Weipa Pty Ltd

Amrun Project Construction Marine and Shipping Management Plan

July 2017

Rio Tinto

DOCUMENT CONTROL

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Cover photo taken from the Boyd Port location looking south towards Pera Head.

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ACRONYMS

Term	Definition
AFS	International Convention on the Control of Harmful Anti-fouling Systems on Ships 2001
AHS	Australian Hydrographic Service
AIS	Automatic Identification System
AMSA	Australian Maritime Safety Authority
AQIS	Australian Quarantine Inspection Service
BMP	Biosecurity Management Plan
CCIMPE	National Consultative Committee on Introduced Marine Pest Emergencies
CLC	International Convention on Civil Liability for Oil Pollution Damage 1992
COLREG	International Convention for Preventing Collisions at Sea 1972
DAF	Department of Agriculture and Fisheries (Queensland)
DAFF	Department of Agriculture, Fisheries and Forestry (Commonwealth)
EHP	Queensland Department of Environment and Heritage Protection
DoA	Department of Agriculture
DTMR	Department of Transport and Main Roads
dwt	Dead weight tonnage
EA	Environmental Authority
ECDIS	Electronic Chart Display Information System
EEZ	Economic Exclusion Zone
EHP	Queensland Department of Environment and Heritage Protection
EIS	Environmental Impact Statement
EPBC	Environmental Protection and Biodiversity Conservation Act
EPCM	Engineering, Procurement and Construction Management
FAMP	Foreshore Access Management Plan
GBR	Great Barrier Reef
GBRMP	Great Barrier Reef Marine Park
GBRMPA	Great Barrier Reef Marine Park Authority
GBRNHP	Great Barrier Reef National Heritage Place
GBRWHA	Great Barrier Reef World Heritage Area
GBRWHP	Great Barrier Reef World Heritage Property
IMO	International Maritime Organization
MARPOL	International Convention for the Prevention of Pollution from Ships 73/78
Mdptpa	million dry product tonnes per annum
MEPC	Marine Environment Protection Committee
ML	Mining Lease
MSQ	Maritime Safety Queensland
MNES	Matters of National Environmental Significance
NESMG	North-East Shipping Management Group
NIMPIS	National Introduced Marine Pest Information System
NSPIMP	National System for the Prevention and Incursion of Marine Pests
OPRC	International Convention on Oil Pollution Preparedness, Response and Cooperation 1990
PSSA	Particularly Sensitive Sea Area
QCCAP	Queensland Coastal Contingency Action Plan
RORO	Roll on/Roll off

Term	Definition
RSPCA	Royal Society for Protection of Cruelty to Animals
RTAW	RTA Weipa Pty Ltd
SEWPaC	Department of Sustainability, Environment, Water, Population and Communities
SoE	South of Embley
SOLAS	International Convention for the Safety of Life at Sea 1974
SOPEP	Shipboard Oil Pollution Emergency Plan
TBT	tri-butyl tin
TMR	Department of Transport and Main Roads
UNCLOS	United Nations Convention on the Law of the Sea 1982

GLOSSARY

Commencement of the action - any works that are required to be undertaken for construction (except exploration, site investigation and **preliminary works**).

Construction – any works that are required to be undertaken for the project including the beneficiation plant (including tailings storage facility); Boyd Port facility, and Hey and Embley River facilitates; dam construction; clearing of vegetation; and infrastructure facilities (including power station, roads, and fuels storage). Excludes **preliminary works**.

Department – the Australian Government department administering the *Environment Protection and Biodiversity Conservation Act* 1999 (EPBC Act).

DoE – Commonwealth Department of the Environment.

EIS - South of Embley Project Environmental Impact Statement (RTA, 2013).

Exclusion zone – a radius around pile-driving operations of no less than 100 metres which must be visually observed at all times during pile-driving operations.

Impacts/impacted – as defined in section 527E of the EPBC Act.

Incidental observation - sightings recorded during field survey (not specifically targeting marine fauna) and described in relation to local geographic features.

Listed dolphin species – listed migratory species under the EPBC Act, specifically Australian Snubfin Dolphin (*Orcaella heinsohni)*; and Australian Humpback Dolphin (*Sousa sahulensis*) – previously the Indo-Pacific Humpback Dolphin (*Sousa chinensis).*

Listed turtle species – listed threatened species and/or Listed migratory species under the EPBC Act, specifically Green Turtle (*Chelonia mydas),* Hawksbill Turtle (*Eretmochelys imbricate);* Flatback Turtle *(Natator depressus);* Loggerhead Turtle *(Caretta caretta);* Olive Ridley Turtle *(Lepidochelys olivacea);* and Leatherback Turtle (*Dermochelys coriacea)*.

Matter of national environmental significance (MNES) – those matters protected under the EPBC Act: World Heritage properties, National Heritage places, wetlands of international importance (Ramsar wetlands), listed threatened species and communities, listed migratory species, Commonwealth marine areas, Great Barrier Reef Marine Park, the environment where nuclear actions are involved (including uranium mines).

Minister – the **Minister** administering the *Environment Protection and Biodiversity Conservation Act 1999* and includes a delegate of the **Minister**.

Observation Zone – a radius around pile-driving operations (unless otherwise agreed to by the **department** in writing, as detailed in Table 2.

1 PURPOSE

The Construction Marine and Shipping Management Plan (the Plan) documents the principles and practices under which RTA Weipa Pty Ltd (RTAW) will undertake all marine-based activities, including shipping, associated with the construction phase of the Amrun Project . The coastal and marine components of the Amrun Project are presented in Figure 1. Figure 2 shows the Amrun port facilities to be constructed at Boyd Point.

1.1. Purpose of This Plan

The Plan has been prepared to satisfy Conditions 5 to 8(i) and 11 to 13 of the Amrun Project approval (EPBC 2010/5642) under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). In accordance with Condition 8(i), the Plan comprises the initial construction phase of the Amrun Project, with an operational-phase plan to be developed at a later date. The Plan also excludes the following construction activities, which are captured under separate conditions in the approval:

- Capital dredging (Conditions 14 and 15)
- Preliminary Works in accordance with the definition in EPBC 2010/5642.

The purpose of the Plan is to define, avoid, manage and mitigate potential negative impacts of construction shipping on the following Matters of National Environmental Significance (MNES):

- The outstanding universal value of the Great Barrier Reef World Heritage Property (GBRWHP)
- Great Barrier Reef National Heritage Property (GBRNHP)
- Great Barrier Reef Marine Park (GBRMP)
- Listed turtle species:
    - Green Turtle (*Chelonia mydas*) – listed as vulnerable and migratory
    - Hawksbill Turtle (*Eretmochelys imbricata*) – listed as vulnerable and migratory
    - Flatback Turtle(*Natator depressus*) – listed as vulnerable and migratory
    - Loggerhead Turtle (*Caretta caretta*) – listed as endangered and migratory
    - Olive Ridley Turtle (*Lepidochelys olivacea*) - listed as endangered and migratory
    - Leatherback Turtle (*Dermochelys coriacea*) - listed as endangered and migratory
- Listed cetacean species:
    - Australian Snubfin Dolphin (*Orcaella heinsohni*) – listed as migratory
    - Indo-Pacific Humpback Dolphin (*Sousa chinensis*) – listed as migratory
    - Bryde's Whale (*Balaenoptera edeni*) – listed as migratory
- Dugong (*Dugong dugon*) – listed as migratory.

Figure 1 Coastal and Marine Components of Project

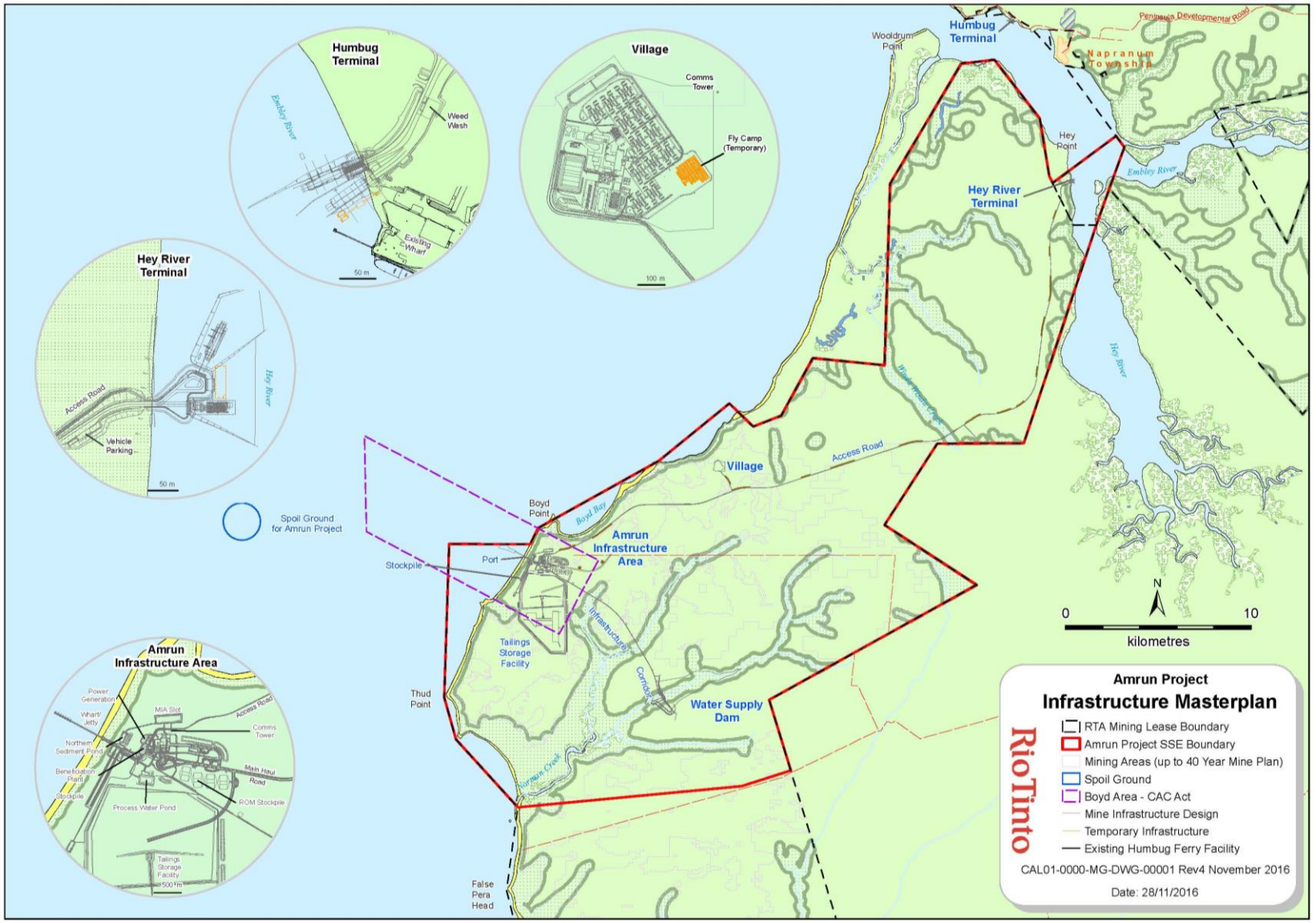
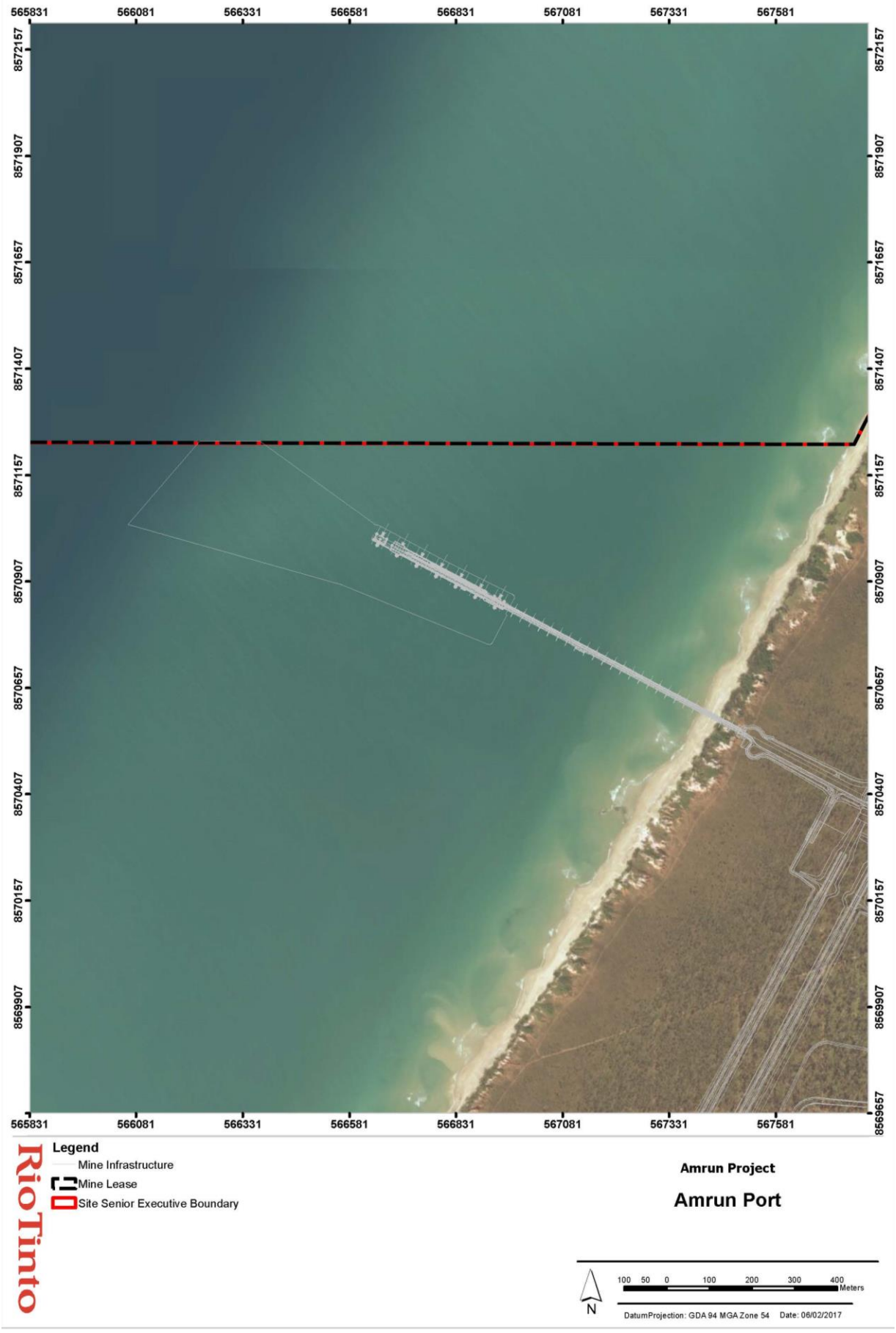


Figure 2 Amrun Port Layout



1.2. Related Management Plans

This Plan is part of an overall environmental management framework for the Amrun Project. It is one of a number of interrelated management plans and strategies that have or will be developed to avoid, manage and mitigate potential environmental impacts of the Amrun Project. Other plans related to this Plan include:

- Temporary Barge Plan
- Construction Spill Prevention and Response Plan
- Criteria for Marine Observers
- Capital Dredge Management Plan – River Facilities
- Capital Dredge Management Plan – Port Facilities
- Foreshore Access Management Plan
- Feral Pig Offset Strategy
- Inshore Dolphin Offset Strategy
- Bunkering Management Plan.

1.2.1. Temporary Barge Plan

The Temporary Barge Plan was developed in accordance with Conditions 1 to 4 of the EPBC approval. The plan documents the environmental management principles and practices RTAW will implement for environmental management of all phases of the construction, operation and decommissioning of the temporary barge facility near Pera Head (see Section 2.2.1).

A critical component of this plan is to manage and mitigate impacts on listed marine turtle species in the Project area. Information gathered under the Temporary Barge Plan will augment existing knowledge of marine turtle abundance and distribution, including nesting sites, in the Boyd Area.

1.2.2. Construction Spill Prevention and Response Plan

The Construction Spill Prevention and Response Plan has been developed to minimise the risk of spills and provide for safe, effective response to spills, including spill from marine facilities and vessels. The plan outlines prevention, controls and spill response and clean-up procedures and assigns roles and responsibilities.

1.2.3. Criteria for Marine Observers

Criteria for marine observers, specifically relating to fauna observations during construction pile-driving, have been developed as required under Condition 13 of the EPBC approval. The criteria include essential and desirable criteria for marine observers, as well as records to be kept by the Project. The criteria were approved by the Minister on 22 October 2014.

1.2.4. Capital Dredge Management Plan – River Facilities

The Capital Dredge Management Plan for the river facilities has been developed as required under Conditions 14, 15, 18 and 19 of the EPBC approval. The plan covers capital dredging and dredged material disposal for Hey River barge/ferry terminal, and the Humbug RORO barge terminal (see Section 2.2.1). The plan describes the existing environment, identifies potential

impacts and defines management and monitoring measures for water quality, marine turtles and mammals, marine pests, benthic habitats and underwater noise.

1.2.5. Capital Dredge Management Plan – Port Facilities

The Capital Dredge Management Plan for capital dredging for Amrun Port was developed under Conditions 14, 15, 18 and 19 of the EPBC approval. The plan will be prepared in accordance with Australian Government National Assessment Guidelines for Dredging (DoE, 2009). No capital dredging for Boyd Port will be conducted until the Dredge Management Plan – Port Facilities has been approved.

The plan covers capital dredging and dredged material disposal for Boyd Port. It will describe the existing environment, identify potential impacts and define the management and monitoring that will be implemented to avoid and mitigate impacts on the Commonwealth Marine Area, listed turtle species, listed dolphin species, dugong, and Bryde's whale.

1.2.6. Foreshore Access Management Plan

The Foreshore Access Management Plan (FAMP) has been developed to comply with Conditions C6 and C16 of the Project's Environmental Authority (EA). The plan also addresses the overall conditions of the EPBC Approval (eg managing impacts to listed turtle species). The plan restricts access for unpermitted persons to foreshore areas between Ina Creek and Winda Winda Creek.

The FAMP defines access permit requirements to protect cultural and environmental aspects of foreshore areas by controlling access of Project construction personnel and activities, as well as to monitor, respond to, investigate and report breaches. The FAMP will be implemented over the construction and operational phases of the Project.

1.2.7. Feral Pig Management Offset Strategy

The Feral Pig Management Offset Strategy and Implementation Plan have been developed as required under Conditions 43 to 48 of the EPBC approval. The strategy covers the coastal zone between Ina Creek and Winda Winda Creek and associated riparian hinterland areas, and focuses on reducing predation on marine turtle nests by feral pigs.

The Feral Pig Management Offset Strategy and Implementation Plan has two components: marine turtle monitoring and feral pig control. Turtle monitoring will involve determining the abundance, timing and significance of nesting areas for each listed turtle species. Feral pig control will involve a feral pig cull to minimise predation on turtle nests.

1.2.8. Inshore Dolphin Offset Strategy

The Inshore Dolphin Offset Strategy has been developed as required under Conditions 49 to 55 of the EPBC approval. It outlines a survey program for the Australian Snubfin Dolphin (*Orcaella heinsohni*) and the Indo-Pacific Humpback Dolphin (*Sousa chinensis*)[1] in the vicinity of the Amrun Project.

[1] The Indo-Pacific Humpback Dolphin (*Sousa chinensis)* and the Australian Humpback Dolphin (*Sousa sahulensis)* are the same species, with a naming revision under consideration. The species is referred to as the Indo-Pacific Humpback Dolphin (*Sousa chinensis*) in accordance with the EPBC Approval.

The findings from the Inshore Dolphin Offset Strategy, including corrective actions and contingency measures relating to operations, will be used to inform the Marine and Shipping Management Plan for the operations phase of the Project. Survey findings will be communicated to the Project team and RTAW operations teams, including Amrun Project Management and RTAW Health, Safety and Environment Manager. Findings and associated corrective actions and contingency measures, if any, will be considered in development and subsequent reviews of the Marine and Shipping Management Plan for the operations phase of the Project.

The Inshore Dolphin Offset Strategy specifies survey methods to determine the distribution and abundance of local and regional populations of the Australian Snubfin Dolphin and Indo-Pacific Humpback Dolphin in the Western Cape York area, and identify habitat used by these species.

1.2.9. Bunkering Management Plan

A Bunkering Management Plan will be developed by the Boyd Port Marine Contractor to manage spill risk during bunkering activities. RTAW will ensure the management plan is developed using the "Guide for the prevention of ship-sourced pollution and for the safe transfer of bunkers in Queensland waters" (MSQ, 2015).

2 BACKGROUND

A detailed environmental impact assessment related to MNES under the EPBC Act, including community consultation is detailed in the South of Embley Project Environmental Impact Statement (RTA, 2013) referred to herein as the Commonwealth EIS.

2.1. Project Approval Conditions

The then Minister for Sustainability, Environment, Water, Population and Communities (the Minister) approved the SoE Project (EPBC 2010/5642) with conditions on 14 May 2013. The approval (varied on 3 June 2014) requires a Marine and Shipping Management Plan for both the construction and operational phases of the SoE Project to be prepared and submitted to the Minister for approval. The Plan for the construction phase must be approved by the Minister prior to the commencement of construction (other than Preliminary Works and pile-driving operations). The conditions relating to the Construction Marine and Shipping Management Plan, and where they are addressed in this document, are outlined in Table 1. Certain conditions, such as those related to the loading and shipment of bauxite, do not apply during the construction phase.

Table 1 Marine and Shipping Management Plan EPBC Act Approval Conditions

Condition	**Where Addressed in this Plan**
Marine and Shipping Management Plan	
5. The person taking the action must submit a Marine and Shipping Management Plan, covering all facets of the **construction** and **operation** of all marine-related precincts for the South of Embley project including, but not limited to, the Boyd Port development, shipping activities, barge and ferry terminals, recreational use of beaches on Mining Lease (ML) 7024 by project workforce and the marine environment, anchoring, and underwater noise (excluding dredge management plans at condition 14 and condition 16) for the **Minister's** approval and must effectively define, avoid, manage and mitigate against **impacts** to the following **matters of national environmental significance:**	Impacts on MNES are defined in Section 6
a. the outstanding universal value of the Great Barrier Reef World Heritage Property;	a. Table 5

Condition	Where Addressed in this Plan
b. Great Barrier Reef National Heritage Place; **c.** Great Barrier Reef Marine Park; **d.** **Listed turtle species;** **e.** **Listed dolphin species;** and, **f.** Dugong (*Dugong dugon)* and Bryde's Whale (*Balaenoptera edeni).*	b. Table 5 c. Table 6 d. Table 4 e. Table 4 f. Table 4
6. The Marine and Shipping Management Plan must incorporate avoidance and mitigation mechanisms for **impacts** to the outstanding universal value of the Great Barrier Reef World Heritage Property; Great Barrier Reef National Heritage Place: Great Barrier Reef Marine Park; **Listed turtle species; Listed dolphin species;** Dugong *(Dugong dugon)* and Bryde's whale *(Balaenoptera edeni)*, including but not limited to:	Section 6 describes avoidance and mitigation measures as follows:
a. **impacts** to the marine environment that supports the above listed species traversing, foraging and/or breeding habitat including, seagrass, reefs and corals, **listed turtle species** nesting and/or foraging habitat;	Section 6.9, Table 4.
b. **impacts** from changes to coastal processes, including beach and/or shore erosion from the Boyd Port development, barge facilities and/or ferry facilities and ensure the action does not alter the beach gradients to such an extent that **listed turtle species** are prevented from and/or impeded in accessing the beach foreshore to nest or **listed turtle species** hatchlings are prevented and/or impeded from entering the marine environment;	Section 6.9, Table 4. (NB: Permanent barge and ferry facilities are located in the Embley/Hey Rivers away from turtle nesting areas).
c. artificial light-related **impacts** on **listed turtle species** (including hatchlings) nesting beaches and adjacent marine environment including, but not limited to, lighting from Boyd Port construction and operation, shipping, temporary passenger landing and barge facility between Pera Head and Boyd Bay, and anchored/moored vessels (but excludes operations within the Hey and Embley Rivers);	Section 6.9, Table 4.
d. measures to ensure shipping activities are undertaken in accordance with the *Great Barrier Reef Marine Park Zoning Plan (2003)*, or its current version	Section 6.5 and Section 6.9, Table 5 and Table 6.
e. mechanisms to implement best practice mitigation and management measures for ship loading and unloading, and all other aspects of shipping activities to minimise **impacts** on the marine environment (including bauxite and/or other contamination spills);	Section 1.2.9, Section 6.3 and Section 6.9 , Table 4 to Table 6. NB: No bauxite loaded during construction.
f. **impacts** from vessel strike to **listed turtle species, listed dolphin species** or Dugongs including, but not limited to, restricting vessel speed limits to 6 knots in water depths of 2.5 metres or less; and, implementation of a transit lane in the Hey River and Embley River that follows the greatest water depths;	Section 6.6 and Section 6.9, Table 4
g. **impacts** from underwater noise including, but not limited to, pile driving activities at Condition 12 and shipping;	Pile driving activities: Section 6.1 and Section 6.9, Table 4 . Vessel noise Section 6.1.3 and

Condition	Where Addressed in this Plan
	Section 6.9, Table 4 to Table 6.
h. measures that minimise the risk of introduced marine pest species over the life of the project, including ballast water management. The marine pest monitoring program must be consistent with the Department of Agriculture, Fisheries and Forestry's *Australian Marine Pest Monitoring Manual (version 2.0),* or its most current version;	Section 6.7, Section 8.2 and Section 6.9, Table 4 to Table 6.
i. **impacts** associated with recreational use by project employees of **listed turtle species** nesting habitat (including, but not limited to, implementation of a permit access system for the employees);	Section 1.2.6 and Section 6, Table 4.
j. if agreed by the **department** in writing, requirements of condition 1 to condition 4 may be incorporated into the Marine and Shipping Management Plan;	Not required. A separate Temporary Barge Plan has been prepared.
k. **impacts** identified in the Environmental Management Plan Outlines at Appendix 7-E (Threatened estuarine and Marine species); Appendix 9-A (Non-avian Migratory Species); Appendix 11-A (Great Barrier Reef Marine Park, World Heritage Property and National Heritage Place); and, Appendix 10- A (Commonwealth Marine Area) in the **Final Environmental Impact Statement;** and,	Section 6 - Table 4 to Table 6.
l. mechanisms to notify the **department** in writing within five (5) business days of any confirmed or suspected sighting/s and/or observation/s in the marine environment in and/or around the project area of the dwarf sawfish *(Pristis clavata*); green sawfish *(Pristis zijsron);* freshwater sawfish *(Pristis microdon);* or the speartooth shark *(Glyphis sp. A*).	Section 8.10
7. The Marine and Shipping Management Plan must also include adaptive management strategies to benefit the outstanding universal value of the Great Barrier Reef World Heritage Property; Great Barrier Reef National Heritage Place; Great Barrier Reef Marine Park; listed turtle species, listed dolphin species, dugong and Bryde's whale. The Marine and Shipping Management Plan must include and address effective management strategies to mitigate each potential impact, desired outcomes, benchmarks, readily measureable performance indicators and goals, timeframes for reporting and implementation, corrective actions and contingency measures, and specify the persons/ roles with responsibility for implementing actions. The Marine and Shipping Management Plan must provide information detailing Traditional Owner opportunities for employment, and mechanisms for reporting the number of local indigenous person/s actually employed in the implementation of this Plan (consistent with condition 42).	Action plans are provided in Section 7, Table 7 to Table 9
8. The Marine and Shipping Management Plan may be submitted to the Minister in the following stages, but the respective stages must not commence until the Minister has approved each respective version of the plan: **i.** an initial plan related to impacts associated with construction activities, other than Preliminary Works and the pile driving operations carried out in accordance with condition 12 to condition 13;	This plan is the initial plan addressing the construction stage of the Amun Project. NB: a separate Temporary Barge Plan has been prepared in accordance with Conditions 1 to 4.

Condition	Where Addressed in this Plan
11. The approved Marine and Shipping Management Plan/s must be implemented.	The Management Plan will be implemented.
Pile Driving **12.** The approval holder must ensure that the following measures related to any pile driving operations are implemented to minimise the **impacts** of underwater noise and disturbance on the following listed threatened species and/or listed migratory species: **i.** **Listed turtle species;** **ii.** **Listed dolphin species**; and **iii.** Dugong *(Dugong dugon)* and Bryde's Whale *(Balaenoptera edeni).* Those measures must include: **a.** pile driving operations must implement **soft start procedures.** The soft start procedures must not commence until the above listed species are observed to leave the **exclusion zone/s** or are not observed in the **exclusion zone/s** for at least 30 minutes**;** **b.** observations for the above listed species must be undertaken over the **observation zone** by a suitably qualified marine observer, for at least 30 minutes before the commencement of pile driving operations, and during pile driving operations; **c.** the **exclusion zone** must be no less than 100 metres from the pile driving operations and be implemented so as to ensure that the above listed species are not exposed to sound exposure levels of greater than or equal to 183 dB re 1µ Pa2.s; **d.** pile driving operations must cease if the species listed above are observed within the **exclusion zone**, and action to cease all pile driving operations within the **exclusion zone** must be taken within two minutes of the observation, or as soon as possible, if it is unsafe to cease pile driving operations within two minutes. Every 30 days during periods when pile driving operations are occurring, the approval holder must report the number of incidents where pile driving operations did not cease within two minutes; **e.** pile driving operations must not recommence until the species listed above observed within the **exclusion zone** are observed to leave the **exclusion zone** or are not observed to leave the **exclusion zone** for at least 30 minutes; and, **f.** only pile driving operations which have commenced prior to sunset or prior to a **period of low visibility** can continue between the hours of sunset and sunrise, unless pile driving operations are suspended for more than 15 minutes.	Section 6.1 and Section 6.9, Table 4
13. The criteria for a suitably qualified marine observer at condition 12b must be submitted to the **Minister** for approval and records must be kept of marine observers subsequently engaged**.** Pile driving operations cannot commence until the criteria has been approved.	Section 1.2.3. NB: The Criteria was approved by the Minister on 22 October 2014

2.2. Amrun Project Description Summary

The Amrun Project[2] involves the construction and operation of a bauxite mine and associated processing and port facilities for shipping of bauxite to either Gladstone or international markets. The Amrun Project involves a staged increase in production of up to 50 million dry product tonnes per annum (Mdptpa) of bauxite. The initial production is likely to be approximately 22.5Mdptpa. Actual production rates and the timing and size of capacity expansions will depend on market conditions. The anticipated mine life is approximately 40 years (depending on production rates).

The Amrun Project is located near Boyd Point on the western side of Cape York Peninsula (Figure 1). The initial construction phase of the Amrun Project is expected to take approximately three years, depending on the timing of the wet season in relation to commencement of construction. Detailed information on the Amrun Project is presented in the Commonwealth EIS (RTA, 2013). The key marine components of Amrun Project associated with this Plan are illustrated in Figure 1 and summarised below.

2.2.1. Project Facilities

Temporary seaborne access (if required) – A temporary barge landing may be constructed near Pera Head, and is addressed in a separate Temporary Barge Plan. If required, a temporary passenger jetty may be constructed near Boyd Point or in Boyd Bay (the location will be determined in consultation with Traditional Owners). It may be operated up until commissioning of the permanent ferry and barge terminals and the all-weather mine access road unless otherwise agreed to by the Queensland Department of Environment and Heritage Protection (EHP).

Barge, ferry and tug river facilities – Permanent River Facilities will be constructed in the Embley and Hey Rivers, including:

- A new roll on/roll off barge terminal (Humbug RORO barge terminal)[3] adjacent the existing Port of Weipa Humbug Point Wharf.
- A new combined roll on/roll off barge and ferry terminal (Hey River barge/ferry terminal) on the western bank of the Hey River.
- During the initial construction phase, temporary berthing facilities will be developed at the Humbug and Hey River sites until the permanent facilities are constructed.

Dredging of the River Facilities is addressed in a separate Dredge Management Plan.

Port and ship-loading facilities – A new Port (Amrun Port) and associated shiploading and tug mooring facilities will be constructed between Boyd Point and Pera Head. Works will include a jetty, bulk carrier vessel wharf and berthing structures, tug and line boat moorings, ship-loader and dredging of berth pockets and departure areas.

Dredging of the Port is addressed in a separate Dredge Management Plan.

[2] Formerly referred to as the South of Embley Project.

[3] In accordance with the Queensland *Sustainable Planning Act 2009* a development approval was obtained for this facility.

2.2.2. Shipping activities

The transport of personnel, cargo, equipment and fuel will be required for construction.

Fuel will be transported in medium-range tankers (55,000 dead weight tonnes; dwt) while freight will include containerised and break-bulk cargo.

The temporary berthing facility at Humbug and the permanent Humbug RORO terminal will allow transport of the workforce from Weipa to the Hey River terminal and back. Regular passenger transfer of construction and operational personnel will occur between these facilities.

The Port of Weipa receives routine deliveries of fuel, cargo, and equipment for existing mining operations at the Humbug Point Wharf, Evans Landing Berth, and Lorim Point wharves via existing shipping routes from domestic (mostly the Port of Cairns) and international ports. The existing deliveries will continue during the Amrun Project. Some cargo for Amrun construction may be carried by vessels that currently make routine deliveries to the Port of Weipa under existing contracts, notably a barge that routinely deliveries cargo from Cairns and a medium-range tanker (55,000 dwt) delivering fuel. These deliveries have been managed under long-standing arrangements without environmental incident, and are not included in this plan.

Most construction equipment, fuel and cargo for the Amrun Project will be delivered to the Humbug Point Wharf, Evans Landing Berth and Lorim Point wharves and then transferred either to vehicles or smaller barges for transport to the Amrun Project area. Some deliveries, such as fuel, construction materials and equipment modules, may be made directly to the Amrun Port site or the Hey River barge/ferry terminal site, depending on the operational constraints of the terminal/s. Some deliveries, such as accommodation modules may also be received at the Aurukun Boat Ramp and transferred to the Boyd Port site via vehicles to the Amrun Project Area. Deliveries from the east coast of Australia (most likely the Port of Cairns) will traverse the Great Barrier Reef (GBR) within the Designated Shipping Areas.

Over the construction period of approximately three years the estimated[4] construction-related deliveries in addition to existing deliveries of material (equipment, fuel and cargo) and workforce during the construction phase include:

- 10 annual international cargo voyages via an ocean charter barge are currently planned to offload at Amrun Port or the Port of Weipa.
- 45 annual cargo barges from domestic ports to the Port of Weipa or directly to the Amrun Project area (once facilities are established).
- 5 annual fuel deliveries to the Port of Weipa via a medium-range (55,000 dwt) fuel tanker.
- 75 cargo and diesel transfer RORO barges per week from the Humbug Terminal to the Amrun Project area.
- 5 passenger small vessel/ferry transfers per day from the Humbug facility to the Hey River Terminal

[4] Actual construction-related deliveries in addition to existing transportation of material (equipment, fuel and cargo) and workforce will be dependent on demand, vessel sizes and the construction schedule.

- Construction vessels including tugs, harbour support vessels and barges (jack-up, dumb etc) will be used for construction works.

A summary of the forecast construction fleet is summarised below. .

Vessel	Task	Number	Year
Landing craft	Cairns to Weipa cabotage	1	Throughout construction
Tug and barge	Cairns to Weipa cabotage	1 each	Throughout construction
Ferry	Cross River Services	1	Nov 2016 to Q1 2019
Ferry	Dredging Vessels	2	Works completed April
Ferry	Port Services	1	Q2 to Q4 2017
Dumb barges	Equipment support	5	Q4 2016 to Q3 2017
Barge	Crane Barge	1	Q2 to Q4 2017
Tugs	Support vessels	4	Q4 2016 to Q3 2017
ROPAX	Transport of cargo and people	1	Nov 2016 to Q1 2019
Dredge	Dredging	2	Q1 to Q3 2016
Barges	Material disposal	4	Q1 to Q3 2016
Jack up barge	Piling	1	Q2 to Q4 2017
Fast Boat	Bechtel Support	1	Q1 2016 to Q4 2018

Bed levelling activities may also be required as part of construction to assist with the safe navigation of vessels. Bed levelling activities would occur in the dredge pockets as required.

3 MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

Profiles for each MNES covered in this Plan (see Section 1) and a summary of previous survey efforts for threatened and migratory marine fauna species and their habitats are provided in Appendix A. More details on each MNES are presented in the Commonwealth EIS (RTA, 2013).

The locations of marine turtle nests recorded on the beach in the vicinity of Amrun Port in surveys in 2007, 2008 and 2013 are shown in Figure 3. The locations of known cetacean records, including those recorded in a 2012 survey for the EIS and another survey in December 2014 are shown in

Figure 4. All cetacean records in the eastern Gulf of Carpentaria are of dolphins and there are no recorded sightings of Bryde's Whale. Records of Dugongs in the Project area from published references are shown in Figure 5.

Figure 3 Marine Turtle Nesting Locations

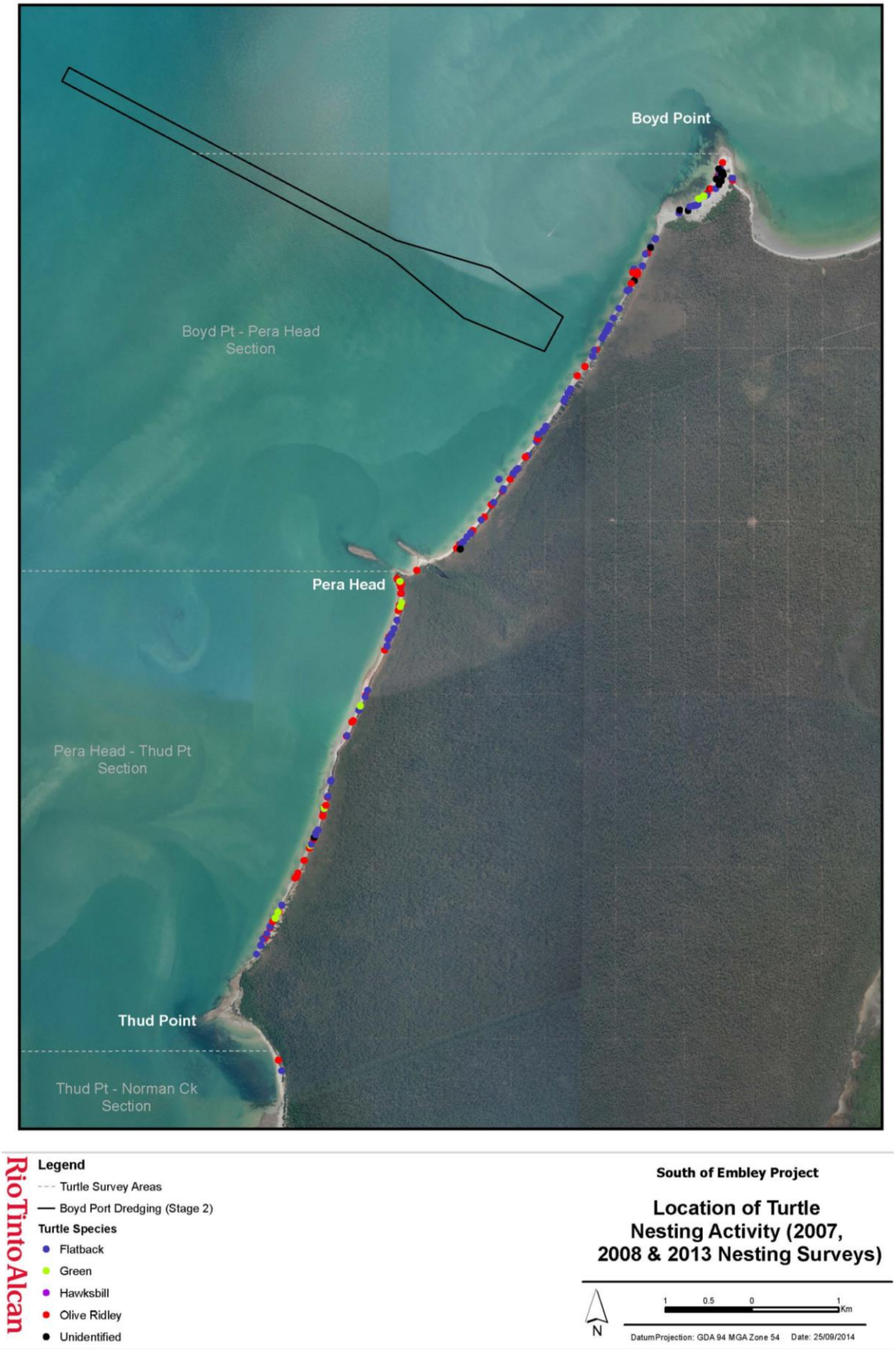


Figure 4 Cetacean Records

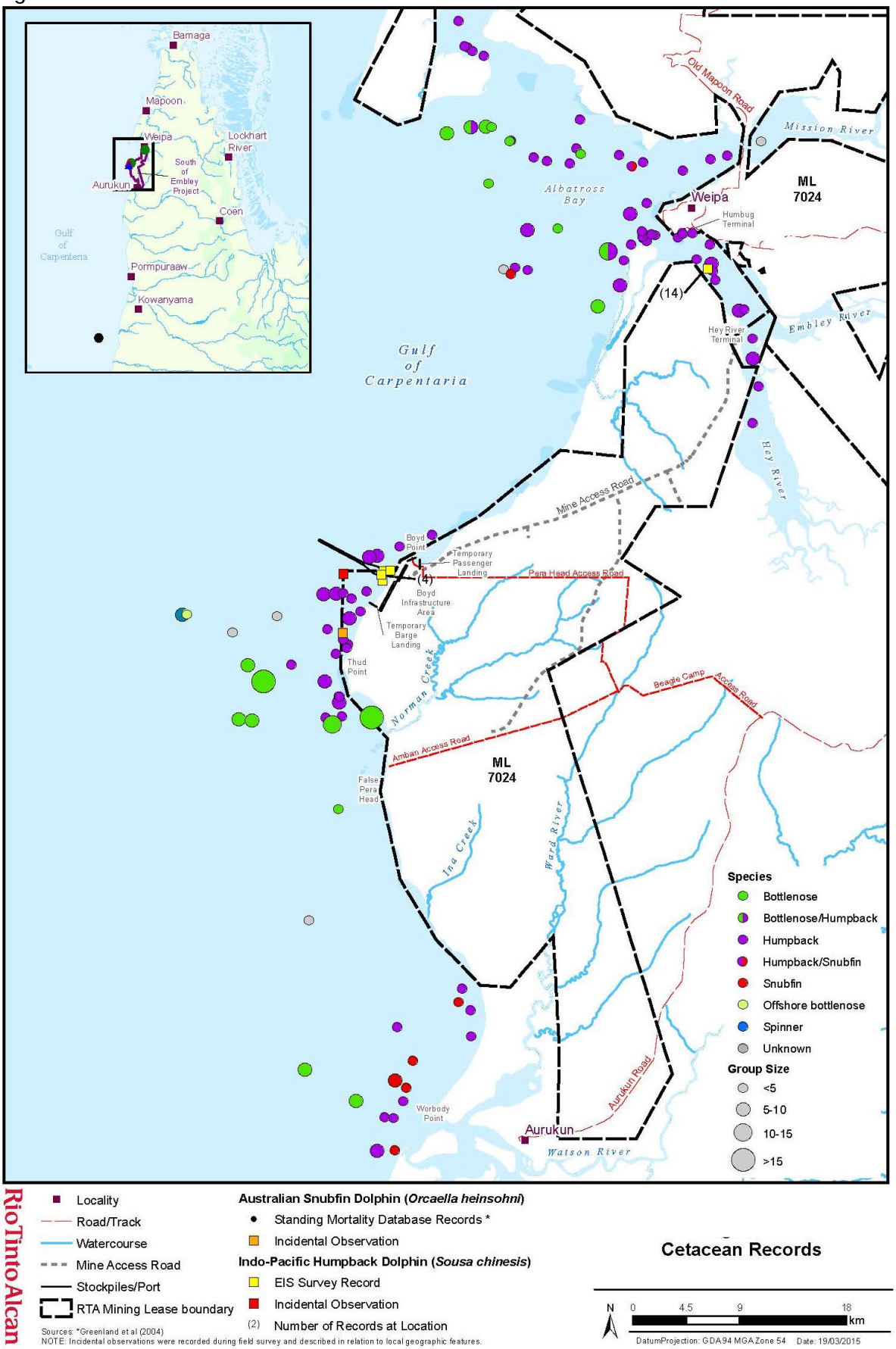


Figure 5 Dugong Records

4 MARITIME REGULATORY REGIME

The following section provides a brief overview of the key legislation and governance frameworks of maritime shipping. Shipping is an international industry that crosses national jurisdictions on a routine basis. Accordingly the maritime regulatory regime is globally harmonized, through a range of international Conventions, protocols and codes, as well as guidelines, developed, agreed and adopted by member countries of the International Maritime Organization (IMO).

Australia is a member of IMO and the national maritime regulatory regime in Australia is consistent with the IMO regime, implemented through a number of Commonwealth Acts, Regulations and Marine Orders which are administered by the Australian Maritime Safety Authority (AMSA). The jurisdiction of AMSA applies to all Australian-flagged and foreign-flagged vessels within the 12 nautical mile Territorial Sea and for some provisions, including MARPOL out to the 200 nautical mile Exclusive Economic Zone (EEZ), and to any Australian-flagged ship wherever it may be.

Additionally, within State waters (3 nautical miles), Maritime Safety Queensland (MSQ) administers maritime regulatory powers, through certain State Acts, Regulations and Marine Orders, which are also generally consistent with the IMO regime. MSQ also requires compulsory port pilotage for certain vessels entering declared ports and mandatory reporting to Port Vessel Traffic Services.

State-regulation of vessel construction and operation and of seafarer qualifications is being progressively de-devolved to AMSA through the National Standard for Commercial Vessels, under the Marine Safety (Domestic Commercial Vessel) National Law Act 2012 (DCV Act). The DCV Act replaces eight federal, state and territory laws with a single law for the safety of all commercial vessels and their crew in Australian waters, including within State waters. It also establishes AMSA as the single National Regulator for commercial vessel safety, although State agencies such as MSQ are delegated by AMSA to administer certain aspects the standardized Commonwealth requirements under the DCV Act. The DCV act applies to all Australian vessels that will be used for the construction of the SoE Project.

All foreign-flagged vessels that may operate in Australian waters for the construction of the SoE Project will be regulated by AMSA under national laws that implement the IMO regime, as outlined below.

The main IMO Conventions, protocols, codes, other legal instruments and guidelines, along with the corresponding Commonwealth and State legislation are provided in Appendix B. These are summarised based on maritime safety and marine environmental protection.

4.1. Special Provisions in the Great Barrier Reef

In addition to the AMSA requirements outlined above, the Great Barrier Reef Marine Park (GBRMP) Act, administered by the Great Barrier Reef Marine Park Authority (GBRMPA) also regulates certain aspects of shipping operations within the GBRMP, including prohibiting discharges of pollutants from ships (in addition to the MARPOL prohibitions).

Under MARPOL, the definition of ‘nearest land” for the Great Barrier Reef region is a defined line along the outer edge of the reef, from which all MARPOL discharge control distances are measures to seaward. This effectively makes the entire Great Barrier Reef a ZERO DISCHARGE area for all MARPOL regulated ship-sourced pollutants (oil, chemicals, harmful packaged substances, sewage and garbage; Appendix C-A)

The Great Barrier Reef Marine Park Zoning Plan also defines Designated Shipping Areas (areas within the Marine Park to which shipping is confined) (Appendix C -B). However, commercial shipping generally complies with the IMO and AMSA declared two way route, which is more restrictive than the GBRMPA Designated Shipping Areas (Appendix C-C).

Additionally, IMO has declared the Great Barrier Reef, Torres Strait and the Coral Sea as Particularly Sensitive Sea Areas (PSSAs), which gives Australia an international mandate to implement more stringent shipping controls known as PSSA Associated Protective Measures (APMs). These include:

- A designated two-way route through Torres Strait and the entire length of the inside of the Great Barrier Reef (AMSA Marine Notice 11/2014))
- Compulsory pilotage in certain areas (Torres Strait and GBR north of Cairns and some areas to the south), for all ships over 70 m in length and all loaded oil tankers, loaded chemical carriers and loaded liquefied gas carriers (irrespective of length; AMSA Navigation Act 2012 and Marine Order 54; Appendix C-D)
- Mandatory reporting for all ships with an overall length of 50 m or more and all tankers regardless of size, transiting the Great Barrier Reef and Torres Strait, through Reef VTS (Vessel Traffic Service; AMSA Navigation Act 2012 and Marine Orders Part 56; Appendix C-E)

4.2. Compliance by Construction Shipping

All vessel contractors that will be involved in construction of the Amrun Project, whether at the Project site or transiting other areas, including the Great Barrier Reef, are legally obligated to comply with all relevant Commonwealth and State legislation, as outlined above. Compliance will also be a contractual requirement for all contractors. Compliance will be monitored by RTAW as described in Section 5.1 through requirements for:

- Ship management plans to be provided to RTAW by all vessel contractors.
- Reporting of any non-compliance events to RTAW management and to relevant regulator(s).
- Routine inspections and audits by RTAW or its agents.

4.3. North East Shipping Management Plan

The North-East Shipping Management Plan (North-East Shipping Management Group, 2014) was developed by AMSA with input from relevant stakeholder groups. The plan covers shipping activities in the Torres Strait, Coral Sea and the GBR and aims to:

- Describe existing measures currently to manage shipping and propose additional measures to minimise the environmental impacts in the short, medium and long terms.
- Inform the Great Barrier Reef Region Strategic Assessment and the Reef 2050 Great Barrier Reef Long-term Sustainability Plan of existing and proposed measures to mitigate shipping impacts on the Outstanding Universal Value and integrity of the Great Barrier Reef World Heritage Property and other MNES.

The plan includes a work program detailing commitments; new management measures; and measures to be kept under review. Some of the actions identified in the plan that are related to potential Project-related construction shipping impacts in Torres Strait and the GBR include:

- AMSA to encourage users of shipping to ports in the region to employ ships fitted with Electronic Chart Display Information System (ECDIS; and appropriately trained navigators) prior to mandatory implementation by 2018. This includes encouraging the uptake of ECDIS through publication of an annual report card by ship-vetting companies.
- If adopted by IMO, AMSA will work with the Australian Hydrographic Service (AHS) and promulgate the establishment of a two-way route from the western end of the Torres Strait to the southern boundary of the GBRMP.
- Keep under review the requirement to fit Class B Automatic Identification Systems on all non-SOLAS commercial vessels.
- Review the effectiveness of the Under Keel Clearance Management system and make appropriate improvements, including reviewing the current deep draught regime and possibility for its extension to other areas.
- Taking into account predictions of traffic density, existing aids to navigation and risk, investigate the benefits of mandatory pilotage for the areas of the upper middle Inner Route of the GBR by 2020.
- Work with pilotage providers to consider the implications of voluntary pilotage in the southern area of the GBR.
- Explore options at the IMO for the development of grey water discharge standards.
- Investigate options to encourage ship charterers in the region to engage ships constructed with bunker fuel tanks in protected locations (built after August 2010) and the means to mandate this requirement for ships calling at GBR ports.
- Continue to work with government agencies and Queensland port authorities to encourage the improvement and use of waste facilities in line with IMO guidelines and information.
- Consider the need for further Associated Protective Measures in the GBR and Torres Strait Particularly Sensitive Sea Area (PSSA).
- Conduct a review and strategic analysis in to invasive marine pests.
- Prepare the National Ship Strike Strategy with relevant government and non-government stakeholders.
- Work with industry and relevant agencies to improve ship-cetacean collision reporting procedures and establish a national portal to hold this data.
- Keep under review modelling and assessments of whale and ship collision risk in the north-east region. In conjunction with IMO guidelines, the results would be used to design and implement appropriate safeguards such as speed limits and high alert areas.
- Keep under review opportunities to conduct research into noise monitoring tools and methods and implications for ship noise mitigation strategies.

- Undertake further research and investigate appropriate measures to manage cumulative impacts from shipping in the GBR.
- Actively contribute to the development of the Department of Environment's cumulative impacts policy and evaluate any implications for ship management measures in the GBR.
- Continue to implement a fully accredited competency based national training programme with broad stakeholder representation that targets response to oil spills in sensitive areas as well as response and understanding of chemical spills and the need to take into account environmental values during response operations.

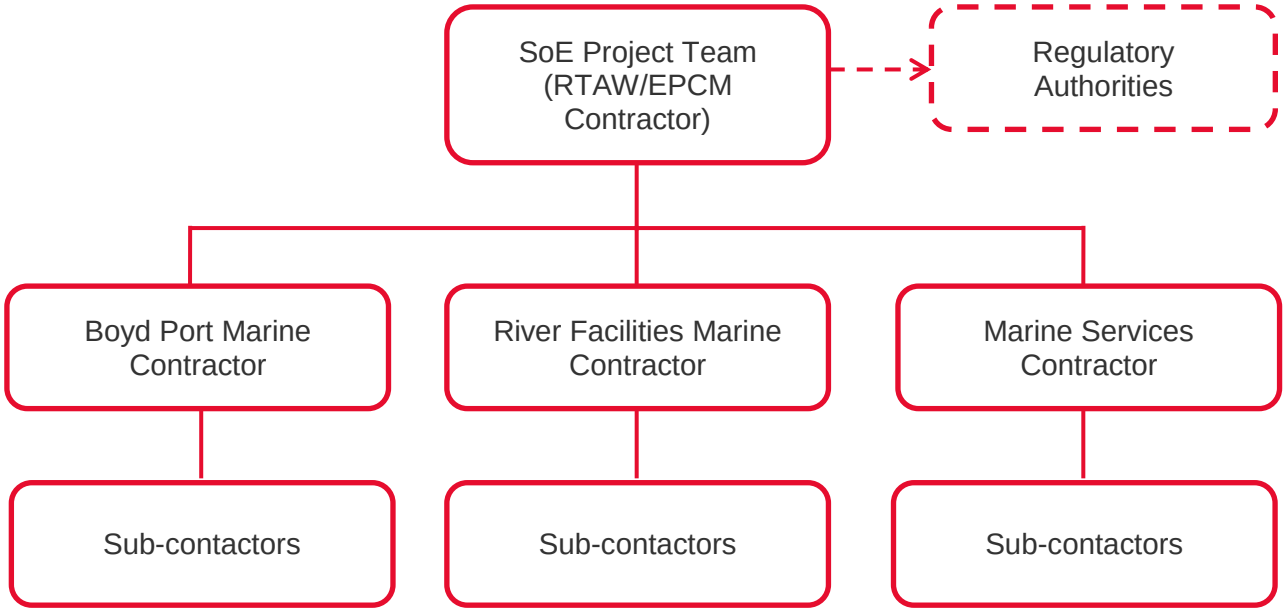
If and when North-East Shipping Management Plan activities result in new requirements for shipping management in north-east Australia, over and above the existing measures as described in sections 4.1 to 4.3, RTAW will implement relevant measures as part of adaptive management.

5 PROJECT ENVIRONMENTAL FRAMEWORK

5.1. Management Structure

The Amrun Project will be managed by both RTAW and the EPCM Contractor as a team, with tasks including managing subcontractors delegated among the team. Primary Marine Contractors will be appointed for construction of Amrun Port, construction of the river facilities, and for marine services such as terminal and ferry operations. The Marine Contractors will have operational responsibility for managing smaller sub-contractors, including construction vessel operators. Management for the project is clearly defined, with identified lines of authority and reporting. The overall management structure is outlined in Figure 6.

Figure 6 Overall Management Structure for the Amrun Project



A number of key management roles have been identified for the Project, as summarised below. The role names are subject to change but the basic structure will remain the same.

Amrun Project Team, Project Manager

- Manages the Project and its execution, including providing adequate resources for environmental management requirements.

- Liaises with Regulatory Authorities, in coordination with the Amrun Project Team Environmental Manager.

Amrun Project Team Line Managers

- Report to the Amrun Project Team Project Manager.
- Day-to-day management of the Project, ensuring employees including subcontractors report to the Project Manager.
- Monitor implementation of management plans including the Construction Marine and Shipping Management Plan, refining procedures as necessary to ensure relevant management measures are implemented effectively and adaptive management/corrective action is taken in a timely manner.
- Review and report on environmental incidents.

Amrun Project Team Environmental Manager

- Reports to the Amrun Project Team Project Manager.
- Supports the Amrun Project Team Line Managers in day-to-day management of environmental performance.
- Monitors environmental performance.
- Reviews compliance with permits and management plans.
- Monitors, investigates and reports on complaints, incidents of environmental non-compliance and environmental incidents.
- Liaises with relevant regulatory authorities including providing monitoring results and reporting non-compliance and environmental incidents.
- Ensures non-compliances and environmental incidents are followed up and corrective actions are implemented within reasonable timeframes
- Ensures environmental monitoring is completed in accordance with approved management and monitoring plans.
- Arranges regular environmental audits.
- Reviews contractor environmental management plans.
- Ensures all contractors are trained in environmental awareness, site issues and the requirements of environmental management plans.
- Ensures environmental management plans and procedures are updated as necessary.

Marine Contractor Project Mangers

- Responsible for day-to-day management of construction activities under the direction of the Amrun Project Team Project Manager and Environmental Manager.
- Ensure all staff are trained in environmental awareness, site issues and the requirements of environmental management plans.

- Monitor environmental compliance and reports non-compliance to the Amrun Project Team Environmental Manager.
- Assist in developing corrective actions for complaints, non-compliances and environmental incidents and ensures they are implemented.
- Facilitate regular environmental audits by the Amrun Project Team Environmental Manager to monitor compliance.
- On-site monitoring as provided for in management plans and procedures.

Employees, contractors and sub-contractors

- Conduct all activities in accordance with the Construction Marine and Shipping Management Plan.
- Report any non-compliances to their line manager.

5.2. Non-compliance, inspections and audits

RTAW will ensure compliance with the Construction Marine and Shipping Management Plan through required reporting of non-compliance and routine inspection and auditing of mitigation and monitoring measures which include:

Incidents - Should any Project personnel become aware of an environmental issue that is causing, or may cause, environmental harm, the person must immediately advise their line manager, who will contact the Amrun Project Team Environmental Manager. Incidents will be investigated and impacts assessed. Corrective actions will be developed as required and recorded in a corrective action register, with a copy of the documented checklist submitted to the Amrun Project Team Environmental Manager and Marine Contractor Project Manager. Corrective actions will be acted on by the Marine Contractor Project Manager and implementation of corrective actions reported to Amrun Project Team Environmental Manager. Relevant regulatory agencies and external stakeholders will be notified by the Amrun Project Team Environmental Manager or Project Manager as required by the Project EPBC approval.

Audit and Inspections – Project worksite inspections and audits will be carried out on a routine basis. These inspections and audits will be documented and deficiencies recorded in a corrective action register, with a copy of the documented checklist submitted to the Amrun Project Team Environmental Manager and relevant Marine Contractor Project Manager. The audit findings will be acted on by the Marine Contractor Project Manager and implementation of corrective actions reported to Amrun Project Team Environmental Manager. Relevant regulatory agencies and external stakeholders will be notified by the Amrun Project Team Environmental Manager as required by the Project EPBC approval.

6 POTENTIAL IMPACTS, AVOIDANCE, MITIGATION AND MANAGEMENT

Potential impacts, avoidance, management and mitigation measures associated with the construction phase of the Amrun Project on MNES covered by this Plan are presented in Table 4 to Table 6. Note that dredging is excluded from this Plan as it is dealt with in separate Dredge Management Plans (see Section 1.2).

Avoidance, mitigation and management measures incorporate the following measures, where appropriate:

- Measures to address construction impacts on the marine environment that supports marine species covered in this Plan. This includes traversing, foraging and/or breeding habitat including seagrass, reefs and corals, and listed turtle species nesting and/or foraging habitat.
- Measures to address construction impacts associated with changes to coastal processes, including beach and/or shore erosion from the Boyd Port development, barge facilities and/or ferry facilities that ensure construction activities do not alter the beach gradients to such an extent that listed turtle species are prevented from and/or impeded in accessing the beach foreshore to nest or listed turtle species hatchlings are prevented and/or impeded from entering the marine environment.
- Measures to address artificial light-related impacts during construction on listed turtle species (including hatchlings), nesting beaches and the adjacent marine environment including, but not limited to, lighting from Boyd Port construction, shipping, temporary passenger jetty and temporary barge facility, and anchored/moored vessels, but excludes construction activities within the Hey and Embley Rivers.
- Measures to ensure shipping activities are undertaken in accordance with the GBRMP Zoning Plan (Great Barrier Reef Marine Park Authority, 2003), or its current version.
- Measures to reduce the risk of impacts from vessel strike on listed turtle species, listed dolphin species or Dugongs, including, but not limited to, restricting vessel speed limits to a maximum of six knots in water depths of 2.5m or less.
- Implementation of a transit lane in the Hey River and Embley River that follows the greatest water depths.
- Measures to address impacts from underwater noise including pile-driving and shipping.
- Measures to minimise the risk of introduced marine pest species, including ballast water and biofouling management.
- Measures to address impacts associated with recreational use by construction employees of listed turtle species nesting habitat including, but not limited to, implementation of a permit access system for the employees.

The measures (including adaptive management measures) summarised in this document are consistent with those proposed in the *South of Embley Project Environmental Impact Statement* (RTA, 2013) as they relate to construction shipping activities and as a minimum reflect the proposed measures for threatened estuarine and marine species (Appendix 7-E), migratory species (Appendix 9-A); the GBRWHP and GBRNHP (Appendix 11-A); and the GBRMP (Appendix 10- A)

6.1. Underwater Noise from Pile Activities

Underwater noise modelling to identify the appropriate observation zones[5] has been carried out for piling activities (pile driving and pile-drilling) during construction of the Port and river facilities and for the installation of navigation aids for listed turtle species, listed dolphin species, Dugong and Bryde's Whale (Appendix 15-A of the Commonwealth EIS). Pile drilling was assessed in regards to underwater noise in section 15.3.2.1 of the Commonwealth EIS (Volume 3, Section 15; http://www.riotinto.com/documents/SoE_EIS_Commonwealth_Vol3_Section_15_-_Noise_and_vibration.pdf) as a 'pile-drill-drive' process. In summary, pile drilling is simply an aspect of pile driving used where harder substrates are encountered and the pile is drilled before pile driving re-commences again. The drilling component was assessed to be comparatively quieter and therefore a lower underwater acoustic impact (maximum 163dB for drilling vs maximum 211 dB for piling (refer Table 15-2 in Section 15.3.2.1).

In accordance with Condition 12 of the EPBC approval, the following measures will be implemented:

- Soft-start procedures will be implemented as described in Section 6.1.3. Soft-start procedures will not commence until listed species are observed to leave exclusion zone/s or are not observed in the exclusion zone/s for at least 30 minutes.
- Suitably qualified marine observers will visually search for listed species within the designated observation zones for at least 30 minutes before the commencement of piling operations and during piling operations.
- The exclusion zone[6] will be no less than 100m from the pile-driving operations and will be implemented so that listed species are not exposed to sound exposure levels of greater than or equal to 183 dB re 1µ Pa^2/s.
- Pile-driving operations will cease if listed species are observed within the exclusion zone, and action to cease all pile-driving operations within the exclusion zone will be taken within two minutes of the observation, or as soon as possible if the operator determines it is unsafe to cease pile-driving operations within two minutes.
- Every 30 days during periods when pile-driving operations are occurring, the number of incidents where pile-driving operations did not cease within two minutes after listed species were observed within the exclusion zone will be reported.
- Pile-driving operations will not recommence until listed species observed within the exclusion zone are observed to leave the exclusion zone, or are not observed in the exclusion zone for at least 30 minutes.

[5] Observation zone is a radius around piling that must be no less than the exclusion zone which must be visually observed during piling activities. Piling activities may continue if an animal is observed in this area and is not in significant distress.

[6] Exclusion zone – a radius around pile driving operations of no less than 100m which must be visually observed at all times during pile driving activities, piling must cease if animals are observed in this zone

- Only pile-driving operations which have commenced prior to sunset or prior to a period of low visibility can continue between the hours of sunset and sunrise. If pile-driving during these periods ceases for more than 15 minutes, pile driving cannot recommence until sunrise.

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6.1.1. Suitably Qualified Marine Observers

The criteria for suitably qualified marine observers (RTAW, 2014) were approved by the Minister on 22 October 2014 in accordance with Condition 13 of the EPBC approval. The Project will maintain records of all marine observers contracted during construction.

6.1.2. Exclusion and Observation Zones

An exclusion zone of no less than 100m will be implemented during piling activities. Piling will not commence or will cease if listed animals are observed within the zone. Observation zones are variable depending on the location of piling, the type and size of the piles, and the species in question. The minimum observation zones are shown in Table 2.

Table 2 Minimum Observation Zones

Port Development							
Species	**Direction of noise propagation**	**Pipe Pile diameter (mm)**					
		1,500	**1,200**	**1,05**	**750**	**355.6**	**1 x 1500 and 2 x 1050**
	Minimum observation Distance (m)						
Bryde's whale	Towards shore	ESL[1]	ESL[1]	ESL[1]	ESL[1]	570[1]	ESL[1]
	Away from shore (all other directions)	1330	1210	930	790	570	1580
Dolphins and dugong	n.r.	400	360	270	230	170	500
Marine turtle	n.r.	470	430	350	280	210	630

Humbug Terminal[2]					
Species	**Sheet Pile diameter (mm)**	**Pipe Pile diameter (mm)**			
	600	**1,050**	**900**	**750**	**600**
	Minimum observation Distance (m)				
Dolphins and dugong	<10	170	160	140	130
Marine turtles	60	210	200	180	160

Hornibrook Terminal[3]				
Species	**Pipe Pile diameter (mm)**			
	1,050	**900**	**750**	**600**
	Minimum observation Distance (m)			
Dolphins and dugong	250	230	210	190
Marine turtles	340	310	280	240

Hey River Terminal[4]					
Species	**Sheet Pile diameter (mm)**	**Pipe Pile diameter (mm)**			
	600	**1,050**	**900**	**750**	**600**
	Minimum observation Distance (m)				
Dolphins and dugong	<10	380	360	330	300
Marine turtles	110	470	440	400	370

Navigation Aids[5]	
Species	**Pipe Pile – 1050 diameter (mm)**
	Minimum observation Distance (m)
Dolphins and dugong	280
Marine turtles	360

1 ESL = Extends to shoreline from the end of the Stage 1 wharf; n.r. = not relevant
2 The distances for Humbug Terminal have their maximum values in a westerly direction.
3 The distances for Hornibrook Terminal have their maximum values in the south-easterly to south-westerly directions.
4 The distances for the Hey River Terminal have their maximum values in Northerly and Southerly directions.
5 The distances for the navigation aids are equal in all directions.

6.1.3. Soft-start procedures

Soft-start procedures will be implemented at the commencement of all marine piling activities, including the installation of navigation aids, by piling at low energy levels and then building up to full impact force. The first five impacts of the piling hammer must be at no more than 50% of full hammer force for at least five blows (for example, a hammer with an adjustable stroke height of 1.2m should drop from a height of 0.6m at least five times before operating at the full stroke height). Soft-start procedures are intended to allow animals to move away from the area of piling activities.

6.2. Underwater Vessel Noise

Underwater noise from construction-related vessels has the potential to impact the behaviour of marine animals, including marine turtles, listed dolphin species, Bryde's Whale and Dugong.

Measures that will be implemented to reduce underwater noise generated by construction vessels include:

- All construction vessels for the Project will be vetted prior to contracting to confirm that their condition and maintenance and survey histories meet AMSA and where relevant, MSQ requirements and modern industry practice. Well-maintained vessels typically generate less underwater noise than poorly maintained ones.
- Where relevant, IMO's guidelines for the reduction of underwater noise from ships (IMO, 2014) will be applied to all construction shipping, including:
    - Ensuring all vessel equipment and machinery receives regular maintenance while engaged on the Project (see Section 6.3.1).
    - Ensuring that all vessels have clean propellers prior to commencing works/mobilising. Project vessels will remain regularly mobile and therefore have limited opportunity for biofouling build-up (which may occur on vessels stationary over a prolonged period of time), which can substantially reduce vessel-generated noise.
    - Where possible, avoiding leaving vessel engines, thrusters and auxiliary plant in stand-by or running mode unnecessarily.
    - Implementing vessel speed restrictions in water depths less than 2.5 meters, with vessels restricted to a maximum of six knots (the IMO's guidelines state that reduced speed is often the most effective noise reduction measure for vessels).
    - Implementing transit lanes following the greatest water depths in the Hey and Embley Rivers, avoiding shallow seagrass areas where Green Turtles or Dugong are most likely to be found. Transit lanes will be developed with MSQ to ensure safe operation

6.3. Prevention of Marine Pollution

6.3.1. Vessel discharges and waste management

As outlined in section 4, MARPOL is the main international convention that regulates the prevention of pollution from ships, given effect in Australia through the *Protection of the Sea (Prevention of Pollution from Ships) Act* (PS(PPS) Act) and related Marine Orders, administered

by AMSA, and in Queensland through the *Transport Operations (Marine Pollution) Act 1995* (TOMP Act) and Regulation administered by MSQ. As outlined in Section 4 MARPOL is divided into six Annexes dealing with different pollutants.

As outlined in Section 4, all vessel contractors that will be involved in construction of the Amrun Project, whether at the Project site or transiting other areas, including the Great Barrier Reef, are legally obligated to comply with all relevant Commonwealth and State legislation. Compliance will also be a contractual requirement for all contractors and will be monitored by RTAW as described in Section 5.1.

Waste reception services will be provided by the project for reception of vessel wastes, excluding quarantine waste. Waste will be segregated on board the vessel in accordance with "Guide to Best Practice for Port Reception Facility Providers and Users" (MEPC.1/Circ.671/Rev.1), where appropriate. Waste will be transferred to a vessel or directly to wharf facilities for holding or disposal at Evans Landing Waste Facility. Waste that cannot be disposed of at the local facility will be placed in appropriate containers or tanks and transported (eg barged) to appropriate recycling, reuse or waste facilities as per the facilities management practices.

Quarantine waste cannot be accepted with the existing waste management facilities at Port of Weipa (NQBP 2012). International vessels that arrive directly at Weipa or Boyd Port will undergo an AQIS inspection where all international waste will be bagged and marked appropriately. Vessels will be contractually required to keep waste on-board the vessel until it can be disposed of in accordance with methods approved by AQIS.

Sewage will be delivered or transferred to a barge or tug for delivery to Humbug where waste will be transferred by an appropriate waste management company for disposal at an appropriate sewage treatment facility.

Some specific provisions that will be applied to construction vessels with regard to the MARPOL pollution categories are as follows:

MARPOL Annex I: Oil

- All discharges of oil, oil residues and oily mixtures from construction vessels will be contractually banned within the Weipa Port Limits.
- Outside of these limits any discharge of oil from construction vessels must be in strict compliance with MARPOL, the PS(PPS) Act and the TOMP Act and Regulation (i.e. <15ppm oil content in any discharge of oily water from machinery spaces only).
- All construction vessels will be contractually required to comply in full with the construction, equipment and operational requirements of MARPOL Annex I and to have the relevant MARPOL-mandated documentation such as Oil Record Book, IOPP Certificate and SOPEP, as applicable to the vessel type and size Waste oil will be held in segregated waste containers on each vessel.
- All waste oil received from construction vessels will be managed in accordance with relevant legislation (Queensland Environment Protection Act & Environment Protection (Waste Management) Regulation).
- All bunkering of construction vessels will be conducted in accordance with the Project's Bunkering Management Plan (see Section 1.2.9).

MARPOL Annex II: Noxious liquid substances carried in bulk

It is not anticipated that any liquid substances other than fuel and oil will be carried in bulk during construction. Should this occur, all vessels will be contractually required to comply with all relevant Australian and Queensland legislation for the transport, handling, transfer and disposal of the substance in question.

MARPOL Annex III: Harmful Substances in Packaged Form (Dangerous Goods)

- Any harmful substances carried in packaged form by construction vessels will be packaged, labelled, loaded, carried, offloaded, stored and disposed of in compliance with MARPOL Annex III, the IMDG Code and the implementing Australian and Queensland legislation.
- All construction vessels will be contractually required to comply with the prohibition on discharges of harmful substances carried in packaged form, including discharge of packages themselves and leakage from packages.
- All construction vessels will be contractually required to carry and to submit the relevant MARPOL-mandated documentation for harmful substances carried in packaged form, such as Stowage Plan and Harmful Substances Manifest.

MARPOL Annex IV: Sewage

- All discharges of sewage from construction vessels will be contractually banned within the Weipa Port Limits.
- Outside of these limits any discharge of sewage from construction vessels must be in strict compliance with MARPOL, the PS(PPS) Act and the TOMP Act and Regulation.
- All vessels will be vetted to confirm they have adequate sewage treatment, management and/or holding facilities prior to contracting.
- Sewage will be pumped from the vessel to a waste management tug or direct to vacuum truck at Evans Landing or Humbug Point to be disposed of by a waste management company at Lorim Point Sewage Treatment Plant or a suitable Sewage Treatment Facility.
- Any sewage not treated on board or received by the waste reception services in Weipa will be retained on board until it can be disposed of in accordance with MARPOL, Australian and Queensland legislation.

MARPOL Annex V: Garbage

- All discharges of MARPOL-defined garbage from construction vessels will be contractually banned within the Weipa Port Limits.
- Outside of these limits any discharge of garbage from construction vessels must be in strict compliance with MARPOL, the PS(PPS) Act and the TOMP Act and Regulation (i.e. zero discharges <3nm from nearest land, only food waste ground to <25mm >3nm from nearest land and only food waste (not ground) >12nm from nearest land).
- All construction vessels will be contractually required to have the relevant MARPOL-mandated documentation such as Garbage Management Plan and Garbage Record Book as applicable to the vessel type and size.
- Waste will be held in segregated waste bins on board the vessel. The waste will then be transported to a barge, tug or waste management area for disposal at a suitable waste management facility

- All garbage received from construction vessels will be managed in strict accordance with relevant legislation (Queensland *Environment Protection Act & Environment Protection (Waste Management) Regulation*).
- All garbage received from international vessels will be treated as quarantine waste and will be managed in strict accordance with the *Quarantine Act* under the Maritime Arrivals Reporting System (http://www.agriculture.gov.au/biosecurity/avm/vessels/mars#mars-benefits)

MARPOL Annex VI: Air Emissions

All construction vessels will be contractually required to comply in full with the requirements of MARPOL Annex VI as applicable to the vessel type and size.

Training and awareness

All employees and contractors involved in the handling, transfer, storage, and disposal of oil and hazardous substances will be trained in the relevant regulatory requirements, the Project's management plans, systems, processes, and procedures, and their responsibilities.

6.3.2. Anti-fouling Emissions

Anti-fouling emissions are regulated through the AFS Convention and the Australian *Protection of the Sea (Harmful Anti-fouling Systems) Act 2006*. All construction vessels (excluding trailered vessels) will be contractually required to comply with these, in particular a ban on the use of anti-fouling paints containing organo-tin compounds and the provision of a TBT Free Certificate or AFS Declaration, as relevant to the vessel type and size, prior to mobilisation to site. In addition:

- As part of the marine pest risk assessment process (Section 6.7), all vessels with antifoul will be required to provide a certificate showing date and location of the most recent application of an antifouling coating. Antifouling coatings older than their working life are likely to result in a marine pest risk rating that requires the application of new antifouling. This will reduce the risk of emissions because aging antifouling coatings have a higher risk of flaking or chipping into the environment.
- All domestic vessels will be required to use an antifouling coating registered for use in Australia in the Public Chemical Registration Information System (PubCRIS; https://portal.apvma.gov.au/pubcris).
- In-water cleaning of vessels will be prohibited while the vessel is under contract, in accordance with the Australian anti-fouling and in-water cleaning guidelines (DAFF and SEWPaC, 2012). This eliminates the risk of particles of antifouling coating being released from the vessel to the environment during cleaning.
- Any re-application of antifouling coating needed while the vessel is under contract will be done at a shore-based maintenance facility. There are no such facilities at the Boyd Port site or the Port of Weipa.

6.3.3 Maritime Safety Management

Safe vessel operation is crucial in prevention of marine pollution from vessels. Measures for safe operation are outlined in Section 6.5

6.4. Spill Management and Response

6.4.1. Spill Management Controls

Operational spill management controls to prevent oil and other spills into the marine environment during construction include:

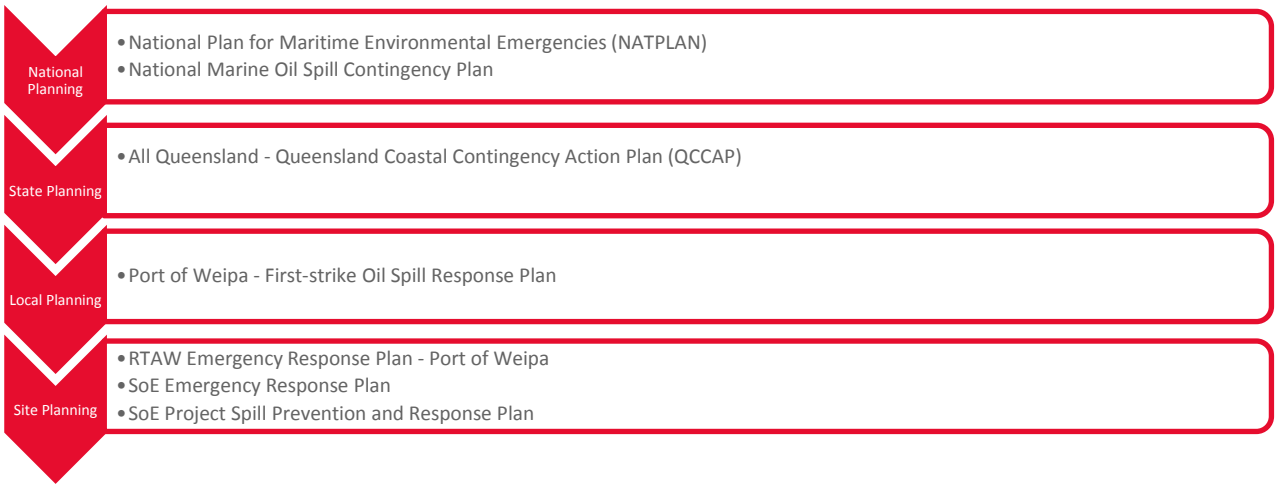
- Complying with vessel traffic management controls (Section 6.5).
- Bunkering in accordance with the Bunkering Management Plan.
- Compliance with AMSA Marine Order 32 (Cargo handling equipment 2011) or current version with clearly identified roles and responsibilities.
- Regular and documented maintenance of all vessels and equipment.
- Vetting of vessels for condition, maintenance and survey history prior to contracting.
- Relevant employees and contractors involved in the storage, handling, transfer and disposal of fuel and other materials will be trained to ensure they are aware of their responsibilities and the Project systems, processes and procedures.
- Relevant contractors will be required to undertake spill response training and appropriate training exercises in accordance with their plans.
- Secondary containment will be used to reduce the risk of spills occurring from accidental rupture or leaks at transfer points at Boyd Port and Aurukun.
- An oil spill response plan will be prepared for the barge carrying fuel tanks to Amrun Port.
- Properly trained and certified crew.
- Bridge management and fatigue management systems.
- Ship security plan.
- Automatic Identification System (AIS), as required.
- Regular drills and exercises for crews.

6.4.2. Spill Response

While the measures outlined in Section 6.3 are designed to prevent marine pollution from construction shipping, while unlikely, there is always the potential for incidents to occur resulting in accidental discharges and spills. It is therefore also necessary to have a spill management and response plan, which identifies management methods, procedures, roles and responsibilities for rapidly responding to, containing and cleaning up any such spills to ensure the marine environment remains protected.

The Spill Management and Response Plan for the Amrun Project has been developed in accordance with Australia's National Plan for Maritime Environmental Emergencies (NATPLAN), the Queensland Coastal Contingency Action Pan (QCCAP) and the Port of Weipa First-strike Oil Spill Response Plan. The hierarchy of spill management plans at national, state, local and site levels is summarised in Figure 7.

Figure 7 Hierarchy of Oil Spill Response Planning



The NATPLAN arrangements provide for a "tiered' response to marine oil and chemical spills:

- Individual ports, terminals and marine facilities: Relevant operator is responsible for maintaining a "first strike" response capability and site-specific plan
- State (spills within 3nm): Relevant State authority is responsible for coordinating the response. In Queensland this is MSQ through the QCCAP).
- National (spills beyond 3nm or within 3nm that are too large for State to manage): AMSA is responsible for coordinating the response with support from other parties under the NATPLAN.

The NATPLAN (AMSA, ND) and QCCAP (DTMR, 2014a) and local plans identify the following key roles in the event of a spill in Queensland waters:

- Statutory Agency: In Queensland, MSQ is the designated government agency with responsibility to verify that ports have adequate spill response plans, capability and enforce other requirements. In the event of a spill, MSQ is responsible to verify that a satisfactory response is implemented. MSQ is also responsible for prosecutions and recovery of clean-up costs on behalf of all participating agencies. MSQ also assumes the Combat Agency role in coastal waters outside port limits to 3 nautical miles offshore, including in the GBRMP.
- Combat Agency: the agency that directs and manages the spill response, with response assistance able to be provided by other parties under Combat Agency direction. Combat Agencies have the operational responsibility to take action to respond to an oil spill in the environment in accordance with the relevant contingency plan. Combat Agencies within Port Limits are generally port authorities.
- First Strike Response Agent: local spill-response plans designate the appropriate first-strike response agent who is responsible for initiating and carrying out first-strike response operations. The first-strike agent assesses the time and resources required to effectively manage an incident and requests assistance as necessary if the response is likely to be prolonged or outside the first-strike response capability.
- Vessel Masters are responsible for taking prompt and effective action to ensure the safety of the vessel and cargo and notifying MSQ of the situation.

- Environmental and Scientific Coordinator: Nominated by the Queensland Government to provide environmental input to planning and decision-making, and providing advice regarding the likely environmental effects of a spill event.

RTAW already maintains a “first strike” response capability at the Port of Weipa and this will be used to respond to any spills from SoE construction vessels within the port. For the Boyd Point area the construction contractors will be required to develop a Spill Management and Response plan which includes the “first strike” response plan. They will maintain the first-strike response capability, including necessary equipment. The RTAW spill response resources at Weipa will also be available to supplement the construction contractors’ plan if required. The Amrun Point Spill Management and Response Plan will be developed in accordance with AMSA (2013) Technical Guidelines for the Preparation of Marine Pollution Contingency Plans for Marine & Coastal Facilities.

The roles and responsibilities of different parties, and the applicable response plan and arrangements, vary depending on whether the spill occurs in the Port of Weipa, the Amrun Area, or elsewhere. These are summarised in Figure 8 and Table 3.

Figure 8 Roles and Responsibilities in the Event of an Oil Spill Identifying Lines of Communication

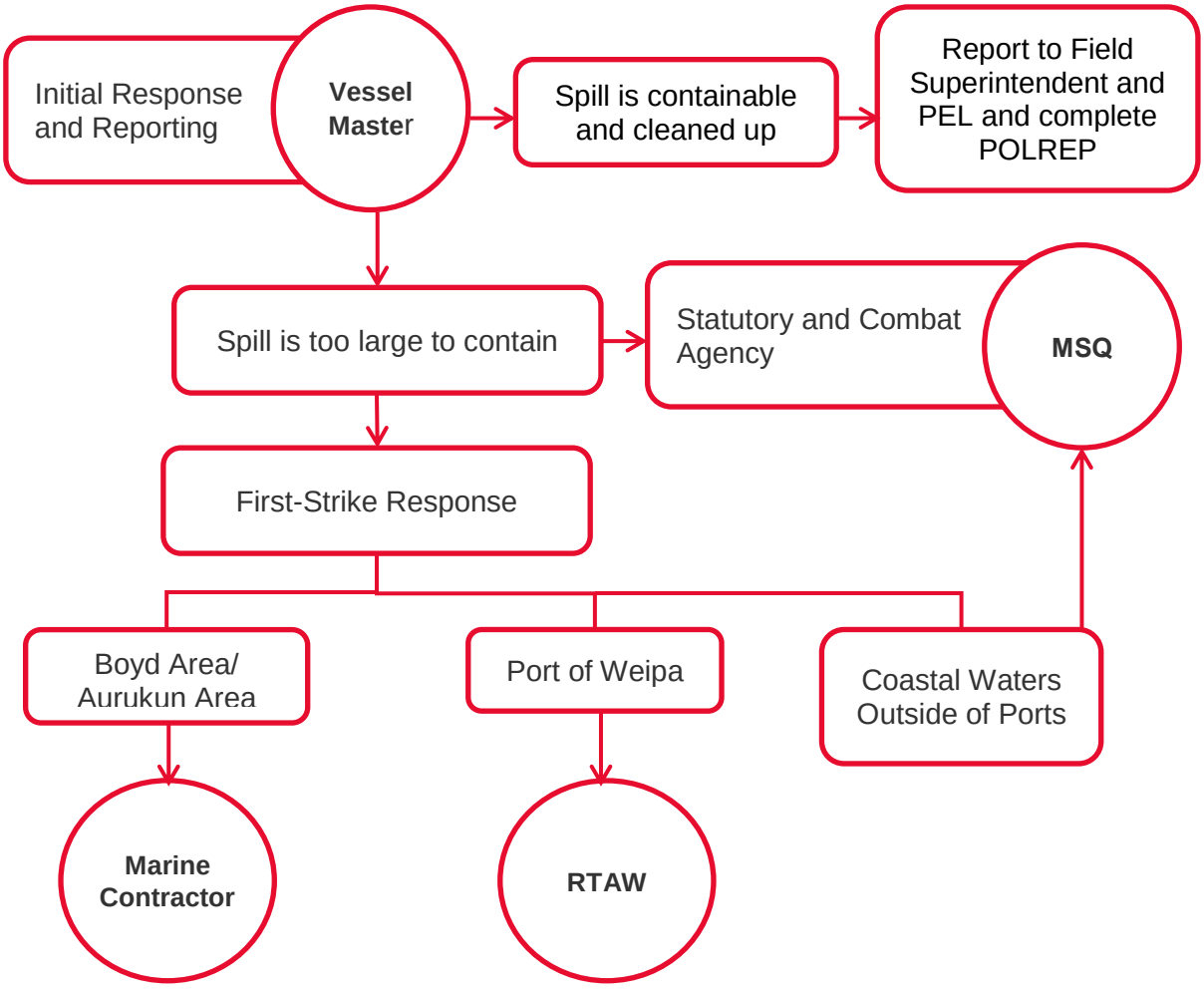


Table 3 Roles and Responsibilities in the Event of an Oil Spill

Responsibility	Agency		
	Boyd Port/Aurukun	**Port of Weipa**	**Elsewhere in QLD**
MSQ is **Statutory** and **Combat Agency** and is the pre-designated **Incident Controller** for spills that impact Queensland coastal waters.	MSQ	MSQ	MSQ
Ensuring adequate first-strike response is maintained	RTAW	NQBP	MSQ
Responsible for clean-up of oiled shores	RTAW in cooperation with Cook and Aurukun Shire Council (depending on location)	RTAW	Local Council
First-strike response agent in the event of a spill	Contractor	RTAW	MSQ
Initial response in the event of a discharge of oil or substantial threat of discharge of oil – actual or probable. As soon as practicable the contact must be made with MSQ and first – strike response agent; message to MSQ commences "POLREP" then vessel name, IMO number and call sign of vessel.	Vessel Master	Vessel Master	Vessel Master

6.4.3. Spill Response in the Port of Weipa

Oil spill response in the Port of Weipa is outlined in the Port of Weipa First Strike Oil Spill Response Plan, a supplement to the QCCAP (DTMR 2014a). MSQ is both the Statutory and Combat Agency. RTAW is the first-strike response agent. Further details are provided in the following documents:

- Port of Weipa First-strike Oil Spill Response Plan (DTMR, 2014b)
- RTAW Emergency Response Plan - Port of Weipa (RTAW 2015, or most current version).

6.4.4. Spill Response in the Amrun Area

Oil spill response in the Amrun Area will be detailed in the Amrun Spill Management Plan to be produced by the Amrun Port Marine Contractor (see Section 5.1). RTAW will ensure the Spill Management Plan is compliant with all relevant legislation using the "*Technical Guidelines for the Preparation of Marine Pollution Contingency Plans for Marine and Coastal Facilities"* (AMSA, 2013) and the information outlined in this document The Manual on Oil Spill Risk Evaluation and Assessment of Response Preparedness (IMO 2010) may also be used as a guidance document. The project will work with MSQ to review and develop plans. MSQ will be the Statutory and Combat Agency and the Boyd Port Marine Contractor will be the first-strike agent.

6.4.5. Spill Response outside the Port of Weipa and Amrun Area

Spill response may also be required outside of the Port of Weipa or Amrun Area, such as in the Gulf of Carpentaria or the GBRMP. In such an incident, vessels will be required to apply the relevant response plan, commencing with the vessel's SOPEP, and following the response plan identified in the QCCAP, REEFPLAN or NATPLAN for the spill location. Vessel Masters are responsible for initiating a first response and reporting the spill to MSQ. MSQ will be the Statutory Agency and Combat Agency. The first-strike agent will depend on the location.

6.4.6. Shipboard Oil Pollution Emergency Plan (SOPEP)

In addition to the site-specific plans, construction vessels will have SOPEPS as required by Annex I of MARPOL and the implementing Australian and Queensland legislation.

6.4.7. Marine Pollution Reporting (POLREP)

POLREPs are required for any illegal vessel discharge to the marine environment. Discharges will be reported to the relevant authority which may be MSQ or AMSA, depending on the location. Any vessel discharges in Queensland of any size to the marine environment will be reported to MSQ using Marine Pollution Report form (POLREP). This can be accessed online http://www.msq.qld.gov.au/Marine-pollution/Contingency-plans.aspx and will be submitted by email to MSQ. Discharges outside Queensland waters will be reported to AMSA.

6.5. Vessel Traffic Management

Project-related vessel movements during the construction phase have the potential to impact marine flora and fauna both directly and indirectly, measures to manage risks include:

- All vessels will be contractually required to comply with all relevant legislation and operate safely and use authorised shipping routes for all travel.
- Installation of navigation aids in Amrun Area.
- Project construction vessels that are required to enter the GBRMP will traverse through the existing Inner GBR Designated Shipping Area and their activities will be conducted in accordance with the GBRMP Zoning Plan (GBRMPA, 2003).
- All vessels will have adequate lighting for safe navigation.
- Vessels will comply with all requests from MSQ or the relevant harbour master unless it is unsafe to do so.
- In water depths less than 2.5m, vessel speed will be restricted to a maximum of 6 knots.
- Vessel Master will implement bridge management systems including fatigue management for safe operation.
- Vessel Tracking Systems, including Automated Identification Systems (AIS) will be used in accordance with legislation and Port requirements.
- Vessels and jackup barges that are required to anchor for construction activities will avoid sensitive areas where possible. Sensitive area will be identified to vessel masters through the induction process.

6.6. Vessel Strike Management

The following measures to reduce the risk of vessel strike of listed turtle species, listed dolphin species, Dugong and Bryde's Whale will be implemented by the Project:

- All vessel Masters and other relevant crew will receive inductions on listed turtle species, listed dolphin species, Dugong and Bryde's Whale and the requirements listed below.
- All construction vessels will be contractually required to comply with applicable parts of

  - IMO Guidance document for minimizing the risk of ship strikes with cetaceans (MEPC.1/Circ.674) and AMSA Marine Notice 12/2011.
  - Division 8.1 of the EPBC Regulations 2000 regarding vessel interactions with cetaceans.
  - The requirements of this Plan.

- Vessels will be required to maintain a lookout for marine fauna when underway, and when these species or other marine fauna are sighted to consider reducing the vessel's speed or making safe course corrections consistent with Division 8.1 of the EPBC Regulations 2000.
- In accordance with Condition 6f of the EPBC approval, vessel speed will be restricted to a maximum of 6 knots in water depths less than 2.5m.
- Transit lanes will be established in the Hey and Embley Rivers that follow the greatest water depths. The transit lanes will be developed with MSQ and when developed the GPS coordinates will be provided to vessel masters which will be stored in the vessel chart plotter.
- Any injury or death of marine turtle, dugong, dolphin or whale will be reported to the DEHP-designated marine stranding hotline through the RSPCA Queensland on 1300 ANIMAL. A Queensland Parks and Wildlife Service officer will then be contacted to determine the relevant response. Any stranding or incident that may be attributable to Project construction activities will be investigated in cooperation with the relevant authorities to determine appropriate corrective action as part of adaptive management.
- Notification to DoE for cetacean death or injury within seven days of resulted activity (1800 803 732 or protected.species@environment.gov.au.

6.7. Marine Pest Prevention and Response

Marine pests have the potential to impact the marine ecosystem of the Project area and then spread to other areas if they are translocated and successfully establish. Marine pests may be transported in a variety of ways including biofouling or in ballast water on a vessel. Introduction of marine pests through ballast water to the project area is unlikely, because larger vessels coming to site are likely to be laden. Many construction vessels such as tugs, barges, and support vessels will not have ballast water tanks or will have fresh water tanks only. The biofouling vector is of higher concern as vessel types used during construction are generally considered high risk due to the type of activities and locations in which they operate (eg stationary in ports).

A number of marine pests have established in Australia, the majority in temperate waters (New South Wales, Victoria, Tasmania and South Australia). An incursion of the Asian green mussel (*Perna viridis*) and Asian bag mussel (*Musculista senhousia*) was recorded in Cairns in 2007. The biosecurity response eradicated the species, with vessel quarantine lifted in 2008 and the area declared free of the species in 2009 (NIMPIS 2015a). An incursion of the black-striped mussel (*Mytilopsis sallei*) was recorded in the locked gate marina in Darwin in 1999. Due to the locked gate nature of the marina an aggressive approach was taken, with chemical treatment of each marina area. The biosecurity response eradicated the species, with vessel quarantine lifted in 1999 (NIMPIS 2015b).

Marine pest biosecurity does not include management of cargo and waste this is managed under the Maritime Arrivals Reporting System (MARS) (http://www.agriculture.gov.au/biosecurity/avm/vessels/mars#mars-benefits) which controls biosecurity management for both cargo and waste. The MARS is required by all commercial vessel masters for every vessel seeking biosecurity clearance and must be lodged in the MARS system.

6.7.1. Ballast Water Management

IMO has produced guidelines for ballast water (IMO, 2005) to support the Ballast Water Convention. Although the Ballast Water Convention has not come into force internationally because signatory nations do not represent the required percentage of global shipping tonnage, Australia implements the ballast water guidelines through the *Quarantine Act 1908*.Ballast water management in Australia is detailed in Seaports Program: Australian Ballast Water Management Requirements (Commonwealth of Australia, 2013 or latest version).

Mandatory ballast water management requirements are enforced by AQIS and require exchange of ballast water at sea. All vessels entering Australian waters are required to submit a ballast water management summary with their quarantine pre-arrival form to AQIS. Approval to discharge ballast water in Australian waters will not be given unless the vessel demonstrates ballast water exchange at sea. There are no Queensland requirements for management of ballast water taken up in Australian waters in other states.

Management requirements for ballast water

- Comply with the ballast water exchange requirements of the Quarantine Act (1908); or
- If the vessel has an on-board ballast water treatment system, with the treatment requirements of the IMO BWM Convention, where approved by the Quarantine Act (1908).

6.7.2. Biofouling Management

IMO has produced guidelines for biofouling management (IMO, 2011). IMO's biofouling management guidelines are voluntary. Australia's National Biofouling Management Guidelines/Guidance for commercial vessels, non-trading vessels and the petroleum industry (NSPIMP 2009a, 2009b, 2009c) under the National System for the Prevention and Management of Marine Pest Incursions (National System) are also voluntary. The guidelines recommend the application of antifouling coatings (including in niche areas), internal seawater system treatment and cleaning of all submersible surfaces to remove biofouling.

Marine pest management measures will include the following:

- Application, maintenance and certification of antifouling coatings on vessel wet surfaces (including in niche areas) excluding trailered vessels[7].

[7] Trailered vessels are defined as those vessels which are removed from the water on a trailer regularly and therefore do not spend prolonged periods of time in the water. These vessels are low risk from a pest perspective as they spend extensive periods out of the water and are washed on a regular basis. This eliminates the chance of antifouling flaking and being released into the water

- Prior to mobilisation to site all vessels (including dredgers, barges and support vessels) and submersible equipment (eg moorings, piping), excluding new submersible equipment, will have a marine pest risk assessment completed by a marine biologist who has experience is marine pests. The assessment will consider:
    - Vessel type
    - Cleaning and marine pest inspection history
    - The presence, age and suitability of antifouling coating
    - The type and treatment history of internal seawater systems
    - Previous areas of operation (including climatic region, and the presence of marine pests of concern) since the last documented cleaning and/or marine pest inspection, and the duration the vessel spent in those areas
    - Activities in areas with known records of marine pests
    - Residual Sediment
    - The nature of previous vessel operations
    - Time to be spent on site (less than 48 hours)/vessel stand-off
    - Any periods spent out of water immediately prior to mobilisation.
- All vessels rated above a low risk will be required to implement risk mitigation measures such as:
    - Hull and niche space cleaning
    - Internal seawater systems treatment
    - Physical marine pest inspection by personnel with qualifications and experience in marine pest management
    - Additional management methods must be detailed and the vessel must be cleared as free of biofouling or low risk prior to mobilisation to site.
- Vessel contractors will be contractually required to provide the documentation and information necessary to conduct the risk assessment.
- In-water cleaning of construction vessels will be prohibited while the vessel is under contract, in accordance with the Australian Anti-fouling and In-water Cleaning Guidelines (DAFF and SEWPaC, 2013). This reduces the risk that marine pests will be physically released from the vessel into the environment in the event that the vessel does harbour undetected marine pests.
- If marine pests are recorded in an area the project will implement the management measures recommended by responding government departments (eg DAF) and Emergency Response Teams (eg investigation and eradication).

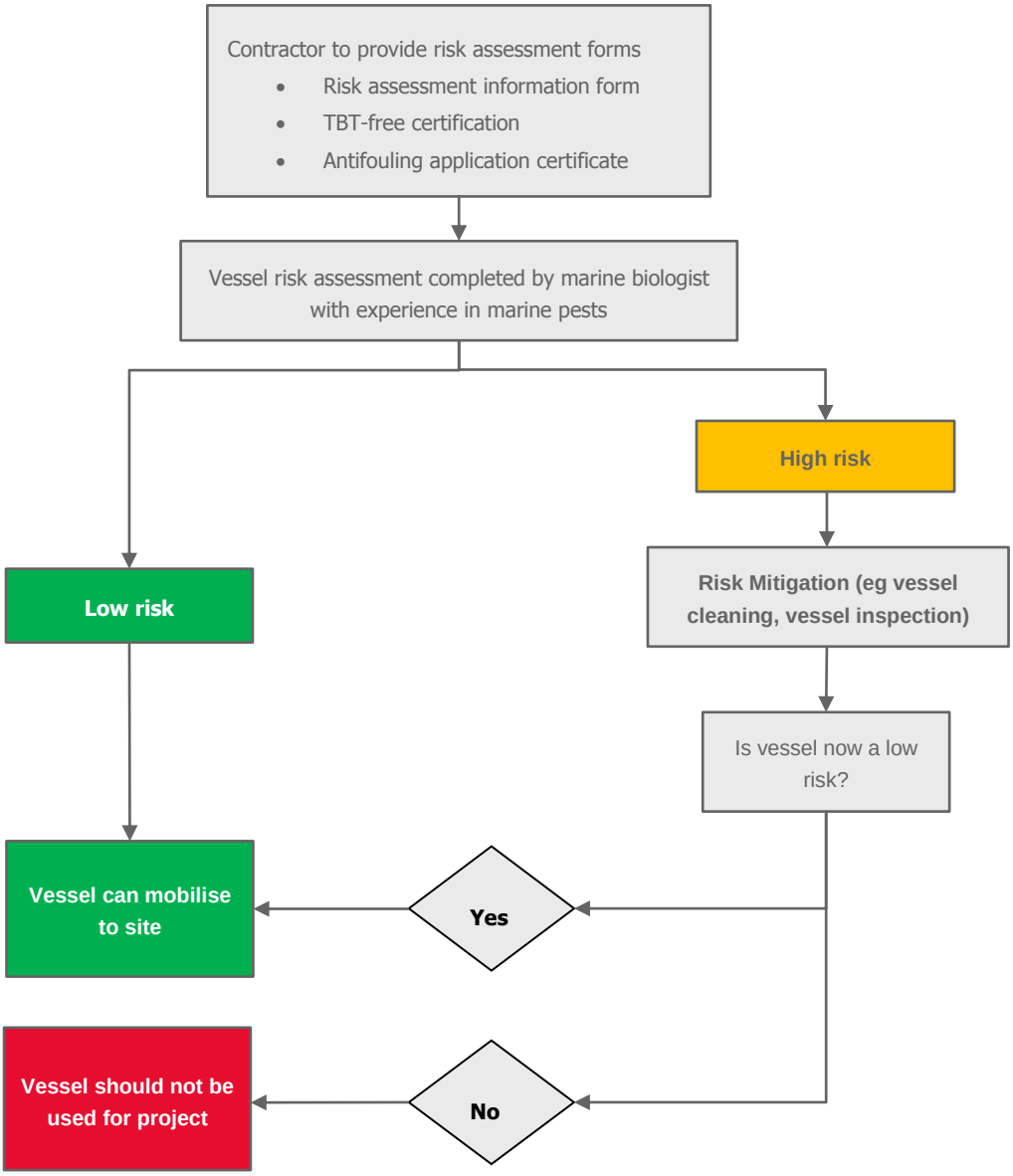
Vessels will be assessed for risk on a case by case basis with consideration of the measures detailed above. An overall restriction to rate all vessels north of the Tropic of Capricorn high risk vessels will not be applied as this approach does not accommodate aspects such as how recently

vessels were cleaned and time spent out of the water in dry dock. For example a vessel that comes from a high risk area such as south-east Asia where marine pests are known to occur is potentially a high risk. The risk associated with that vessel would reduce if it had recently spent two weeks out of water, underwent recent cleaning, antifouling application, appropriate internal seawater system treatment and left waters within seven days of refloating and would potentially be low risk. This method is consistent with previous assessment methods completed for Queensland projects (BMA 2014) and WA Fisheries entry requirements (Vessel Check; DoF 2015; DoD 2014; DoF ND.). The process for marine pest risk assessment is shown in Figure 9.

All assessments will be made by a qualified marine biologist with experience in marine pests. Possible scenarios where a vessel would be rated a high risk include:

- They do not comply with AQIS quarantine requirements
- Vessel has spent greater than 7 days in high risk area and has no internal sea water system treatment and intend to operate on site for greater than 48 hours
- Has spent greater than 7 days stationary in high risk area and has had no recent cleaning, antifouling application or inspection and intend to operate on site for greater than 48 hours

Figure 9 Marine Pest Risk Assessment Procedure



6.7.3. Marine Pest Surveys and Monitoring

Marine pest monitoring will be conducted before, during and after construction as described in Section 8.2. Should a marine pest listed on the CCIMPE Trigger List of marine pest species be detected, the Project will notify DAFF and the Queensland Department of Agriculture and Fisheries (DAF) as soon as practicable. Relevant government agencies will then initiate a response in accordance with the Australian Emergency Marine Pest Plan (EMP Plan) Control Centre Management Manual (DAFF, 2006). All contracted vessels will be required to comply with requests from the regulatory authorities implementing the emergency marine pest response.

6.8. Lighting Management

Artificial lighting has the potential to disorientate nesting female and hatchling turtles. To minimise the impacts of lighting on nesting females and turtle hatchlings, the following management measures will be implemented:

- Vessel lighting and light spill beyond the vessel will be limited as far as practicable while allowing for safe operations.
- To minimise impacts of artificial lighting in the Boyd Port construction area and at the temporary barge facility during turtle nesting and hatchling season:
    - Lighting will be minimised to that essential for safety as far as practicable
    - Lighting will be turned off to the extent practicable when facilities are not in use, for example through timers or movement sensors, subject to safety and security requirements
    - Shielding, minimum practical installation height, recessing and/or direction of lighting away from the foreshore will be used to the extent practicable to reduce light spill outside of work areas
    - Long-wavelength lighting (e.g. low-pressure sodium) or other lighting demonstrated to have a low impact on turtles will be used to the extent practicable.
- To minimise impacts of artificial lighting at the temporary passenger jetty, the facility would not operate at night unless in an emergency.

6.9. Summary of Management Measures

Table 4 Summary of Management Measures for Marine Turtles, Cetaceans and Dugong

Potential Construction Impact	Summary of Management Measures
Physical Disturbance to Benthic, Intertidal Habitats or Beach Habitats, such as: • Direct removal of habitats for construction of infrastructure • Construction of wharves and jetty • Disturbance from piling activities • Damage from vessel anchoring and jackup barges • Damage from collision • Disturbance of marine turtle nesting areas through construction of wharves and jetty • Potential change to beach gradient through changed sedimentation processes • Physical effects of recreational use of beaches (eg trampling) • Removal of sediment build-up within dredge	**Location, Design and Operations of Marine Infrastructure** • Port, temporary barge landing and temporary passenger jetty will be located to minimise direct impact on reef systems as far as practicable. • Barge and ferry terminals, temporary barge landing and temporary passenger jetty will be located to minimise direct impact on seagrass as far as practicable. • The open trestle design of the Port jetty will not significantly impede or capture sediment moving along the shoreline. Potential impacts will be monitored and management measures implemented if any changes are identified. • Bunting and/or signage will be used along pathways to avoid disturbance to adjacent potential marine turtle nesting areas. • Use of nominated paths by all project staff. • Awareness training provided through inductions. **Removal of Temporary Infrastructure** • All temporary infrastructure will be removed when no longer required. If piles cannot be removed they will be cut off below the surface **Anchoring** • Vessels and jackup barges that are required to anchor for construction activities will avoid sensitive areas where possible. Sensitive area will be identified to vessel masters through the induction process. **Collision or Grounding** • In water depths less than 2.5m, vessel speed will be restricted to a maximum of 6 knots. • Vessels will follow transit lanes that follow the maximum depth in the Hey and Embley Rivers and stay in designated shipping lanes. The transit lanes will be developed with

Potential Construction Impact	Summary of Management Measures
footprints from bed levelling activities	MSQ and when developed the GPS coordinates will be provided to vessel masters which will be stored in the vessel chart plotter. • Vessels will comply with all relevant legislation and operate safely. • Vessel Masters will implement bridge management systems including fatigue management for safe operation. • Vessels will use pilots in areas of compulsory and recommended pilotage. • In accordance with legislation, relevant vessels will be required to carry an AIS. **Marine Turtle Nest Inspections** • Ten days prior to any disturbance of the beach for construction of Boyd Port during turtle nesting and hatching season, visual surveys of marine turtle crawls and nests will be conducted within 100m of the disturbance footprint. These surveys will continue daily until construction activities on the beach are completed or turtle nesting and hatchling season is complete. If nests that have not been predated by feral pigs are present during these inspections, we will either (a) aim to avoid the active nest during construction or (b) consult with the EHP to evaluate options for the relocation of nests to a distance of at least 100m outside the potential zone of impact. Any active nests will be marked and exclusion markers installed. **Foreshore Access Permit System** • Implementation and enforcement of a beach access permit system (see Section 1.2.6 for more detail). • Access to the beach by the construction workforce at night for recreational purposes will not be permitted. **Bed Levelling** Bed levelling will occur within the already approved dredge pocket. The State level Environmental Authority at Condition J3 (The site Environmental Authority (EA) can be found here https://environment.ehp.qld.gov.au/env-authorities/pdf/epml00725113.pdf) authorises bed levelling subject to there not being a release of contaminants to waters. There will be minimal localised seabed disturbance and there are no sensitive environments immediately adjacent that would be impacted by bed levelling activities and therefore no impact to MNES. • Bed levelling activities will occur in dredge pockets as required, visual monitoring of plumes will occur, if excessive turbidity is created a period of 3 days rest must be observed after 14 consecutive days in one area. **Pile Drilling** Pile drilling may be required if driving does not allow penetration to the correct depth • Pile drilling activities will occur as required. Visual monitoring of plumes will occur daily, if excessive turbidity is created a period of 3 days rest must be observed after 14 consecutive days.
Underwater Acoustic Impacts from Pile Activities	**Underwater Noise Management during Pile Activities** Management measures to be implemented are based on Condition 12 of the EPBC approval and are provided in more detail in Section 6.1 of this Plan. • Soft-start procedures. • Observations undertaken by a suitably qualified marine observer for piling activities. • Implementation of observation and exclusion zones. • Cease pile-driving operations if a listed species is observed within the exclusion zone. • Reporting every 30 days during piling operations the number of incidents when pile-

Potential Construction Impact	Summary of Management Measures
	driving operations did not cease within two minutes of sighting a listed species within the exclusion zone. • Non-commencement of operations until all listed species are seen to leave the exclusion zone or not seen in the exclusion zone for 30 minutes. • Limits on operations between sunset and sunrise.
Underwater Acoustic Impacts from Construction-related Shipping	**Construction Shipping Underwater Noise Management** Management measures to be implemented are provided in more detail in Section 6.1.3 of this Plan. • Construction vessels will be vetted for condition and maintenance and survey history. • All vessel equipment and machinery will receive regular maintenance. • Where possible, vessels will avoid leaving vessel engines, thrusters and auxiliary plants in stand-by or running mode unnecessarily. • Vessels will generally have clean propellers as a result of marine pest risk management • Vessel speed restrictions will be implemented in water depths less than 2.5m, with vessels restricted to a maximum of six knots. • Transit lanes will be implemented in the Hey and Embley Rivers that follow the greatest water depths and avoid sensitive areas such as seagrass beds where turtles may be located.

Altered Light Regime due to increased lighting from vessel and construction activities	**Construction Shipping Lighting Mitigation**
	Management measures to be implemented are provided in more detail in Section 6.8 of this Plan
	• Vessel lighting and light spill beyond the vessel will be limited as far as practicable while allowing for safe operations.
	• To minimise impacts of artificial lighting in the Boyd Port construction area and at the temporary barge facility:
	  • Lighting will be turned off to the extent practicable.
	  • Shielding, minimum practical installation height, recessing and/or direction of lighting away from the foreshore will be used to the extent practicable.
	  • Long-wavelength lighting (eg low-pressure sodium) or other lighting demonstrated to have a low impact on turtles will be used to the extent practicable.

Marine Oil Spill	**Construction Shipping Oil Spill Risk Management** Operational controls will be implemented to minimise the risk of oil spills due to collisions, groundings, bunkering, fuel transfer, and mechanical failures. Management measures to be implemented are provided in more detail in Section 6.4. Operational controls include: • All construction activities in accordance with the Project's Spill Management and Response Plan. • Bunkering in accordance with Bunkering Management Plan. • All vessels contractually required to comply with all Commonwealth and State legislation and regulations. • All construction vessels will be vetted for condition and maintenance and survey history prior to contracting. • Regular and documented maintenance for all vessels and equipment. • All vessel personnel will be fully qualified to the relevant IMO, AMSA and/or MSQ standards as applicable. • Using designated shipping lanes. • Bridge management systems (including fatigue management, pilotage and vessel tracking systems). • If required, vessels will have SOPEP.

Potential Construction Impact	Summary of Management Measures
	• Relevant employees and contractors involved in the storage, handling, transfer and disposal will be trained to ensure they are aware of their responsibilities and the systems processes and procedures. • In the event of a spill vessels will follow the relevant spill management plan (eg Port of Weipa, South of Embley). • Secondary containment will be used to reduce the risk of spills occurring from accidental rupture or leaks at transfer points at Boyd Port or Aurukun. • An oil spill response plan would be prepared for the barge carrying fuel tanks to Boyd Port or Aurukun.
Vessel Discharges	**Construction Shipping Discharge and Waste Management** Management measures for vessel discharges and waste depend on the type of waste generated by the vessel and are outlined in more detail in Section 6.3. • Waste reception services will be provided by the project for reception of vessel wastes, excluding quarantine waste. Waste will be transferred by the project to suitable facilities as per the current Evans Landing Waste Management Practices. • All waste will be disposed of in accordance with national and international regulations • Regular and documented maintenance • As per Australian legislative requirements, vessels will have the appropriate Plans and Records book eg Garbage Management Plan, Oil Record Book etc. • Through contractual arrangements all vessels will operate in accordance with international and domestic regulations pertaining to marine pollution. • All vessels to the area will be vetted for condition and maintenance and survey history prior to contracting. • All vessels will be contractually required to provide a TBT-free and an AFS Certificate. • Vessels with antifouling coatings older than their working life will not be contracted. • All domestic vessels will be required to use an antifouling coating registered for use in Australia. • In-water cleaning of vessels will be prohibited while the vessel is under contract. • Any re-application of antifouling coating will be done at a shore-based maintenance facility outside the Boyd Area and Port of Weipa. • Quarantine Waste cannot be accepted at the Port of Weipa (NQBP 2012) International vessels that arrive directly at Weipa or Boyd Port will undergo an AQIS inspection where all international waste will be bagged and marked appropriately. Vessels will be contractually required to keep waste on-board the vessel until it can be disposed of in accordance with methods approved by AQIS.
Vessel Freight/Transportation	• All vessels carrying liquid chemicals and hazardous goods will ensure freight is carried in proper packaging and handled correctly as per IMDG Code. Bunding of goods may be required depending on the transportation regulations.
Vessel Strike	**Construction Shipping Vessel Strike Management** Management measures outlined below are presented in more detail in Section 6.6. • Inductions for Vessel Masters and other relevant crew. • Crews will maintain a lookout for marine fauna when the vessel is underway. • Consider reducing vessel speed or course alteration consistent with AMSA Marine Notice 12/2011 Division 8.1 of the EPBC Regulations when listed species are sighted. • In water depths less than 2.5m, vessel speed will be restricted to a maximum of six knots. • Transit lanes that follow the greatest water depths will be implemented in the Hey and Embley Rivers. • Any injury or death of a turtle or marine mammal will be reported to the marine stranding

Potential Construction Impact	Summary of Management Measures
	hotline through the RSPCA Queensland on 1300 ANIMAL. • Notification to DoE for cetacean death or injury within seven days of resulted activity (1800 803 732 or protected.species@environment.gov.au.
Marine Pest Incursion	**Construction Shipping Ballast Water Management** Management measures outlined below are presented in more detail in Section 6.7 • Vessels will comply with the *Quarantine Act 1908*, with all vessels coming to site from waters outside Australia assessed for ballast water management by AQIS on arrival in Australia. • Ballast water management will also be assessed in the marine pest risk assessment to be implemented for all vessels. **Biofouling Management** • All vessels and submersible equipment will undergo a desktop risk assessment prior to departure for site. • All vessels assessed as high risk will require additional management measures and/or marine pest inspections by qualified and experienced personnel. • In-water cleaning of construction vessels on site will be prohibited. **Marine Pest Monitoring Program** • A marine pest monitoring program will be conducted, including baseline and end-of-construction surveys and larval settlement plate monitoring during construction. Further information is provided in Section 6.7 and Section 8.2. • Inductions of maritime construction staff assigned to coastal marine facilities will include marine pest awareness on readily observable species and instructions to report sightings of suspected marine pests to line managers. • Any detections of marine pests or suspected marine pests will be reported to responsible authorities in accordance with Australian guidelines.

Table 5 Summary of Management Measures for GBRWHP and GBRNHP

World Heritage Criteria[1]	Corresponding National Heritage Criteria	Potential Construction Impacts	Summary of Management Measures
Criterion VIII – Outstanding Example of Earth's Evolutionary History • Forms the world's largest coral reef ecosystem, extending over 14 degrees of latitude. • Globally outstanding example of an ecosystem that has evolved over millennia. • Environmental history recorded in the reef structure. • Comprises about 3000 separate coral reefs, ranging from inshore fringing reefs to mid shelf reefs and shoals, exposed outer reefs and deep water reefs, including examples of all stages of reef development. • Deep water features of the adjoining continental shelf includes canyons, channels, plateaux and abyssal plains.	**Criterion A – Process: Natural Phenomena, Formations, Features and Exceptional Beauty** **Criterion C – Research: Yield Information to Contribute to an Understanding of Australia's Natural or Cultural History** **Criterion D – Characteristics: Principal Characteristics of Natural or Cultural Places or Environments**	While collisions and grounding, spills (including oil, cargo and waste), operational discharge and marine pest introductions have the potential to impact on the localised health of areas of the GBR, potential construction impacts will not affect this criterion.	No specific management measures for this criterion are proposed.

Criterion IX – Example of Significant Ongoing Geological Processes, Biological Evolution and Man's Interaction with his Natural Environment
• Globally significant diversity of reef and island morphologies reflecting on-going geomorphic, oceanographic and environmental processes.
• Complex cross-shelf, longshore and vertical connectivity influenced by dynamic oceanic currents and ongoing ecological processes such as upwellings, larval dispersal and migration.
• Over 900 islands and cays; around 600 are continental (high) islands, 300 are coral cays in various stages of geomorphic development, with the remaining islands comprising mangrove islands that provide important ecological services.
• An ecosystem that has evolved over millennia with evidence of the evolution of hard corals and other fauna.
• Globally significant marine faunal groups include over 4000 species of molluscs; over 1500 species of fish; plus a great diversity of sponges, anemones, marine worms, crustaceans, and many others.
• Man's interaction with the natural environment illustrated by strong ongoing links between Aboriginal and Torres Strait Islanders and their sea country, including numerous shell deposits (middens) and fish traps, plus the application of story places and marine totems.
	Criterion A – Process: Natural Phenomena, Formations, Features and Exceptional Beauty
	Criterion C – Research: Yield Information to Contribute to an Understanding of Australia's Natural or Cultural History
	Criterion D – Characteristics: Principal Characteristics of Natural or Cultural Places or Environments
		Collisions may potentially impact habitats and heritage through direct impact with these impacts likely to be localised.
		Spills and operational discharges may impact environmental processes, habitats, species survival and development, and larval dispersal. Impacts may be both direct and indirect with spills potentially smothering habitats (e.g. seagrass, mangrove, coral) leading to displacement and food loss.
		Marine pests may impact reef morphologies, environmental processes, habitats, species survival and development, and larval dispersal.
			Management measures to be implemented are provided in more detail in Section 6.1.3, to 6.7 of this Plan; summary and/or additional measures are provided below.
			Construction Shipping Management for the GBRWHP and GBRNHP
			• Construction shipping activities through the GBR will be conducted in accordance with the *GBRMP Zoning Plan* (GBRMPA 2003) or its most current version including:
			  • The existing Inner GBR Designated Shipping Area will be used
			  • Pilots will be used for any vessels over 70m in length when transiting through the inner GBR Designated Shipping Area to the north of Cairns and the compulsory pilotage areas of the Torres Strait.
			  • Real-time GPS (AIS) which is integrated into ReefVTS will be used for all vessels over 50m when transiting through the Inner GBR Designated Shipping Area.
			  • Contractual requirement to comply with all relevant national and state legislation.
			  • All vessels and submersible equipment new to the area will undergo a marine pest risk assessment prior to departing for site. Should a marine pest incursion occur at the SoE all departing vessels will be required to comply with requirements enacted by the regulatory authorities implement Australia Emergency Marine Pest Plan.
			  • RTAW will comply with requirements from findings of the North East Shipping Management Plan as part of adaptive management when appropriate.
			Spill Management of Construction Shipping for the GBRWHP and GBRNHP
			• Spills will be responded to in accordance with ReefPlan, QCCAP and the NATPLAN as applicable (Section 6.3).
			• Vessels will comply with Australian legislation to have an approved SOPEP, if required. Should a spill occur, the vessel master will try to contain the spill (if safe) and contact MSQ immediately to report and request assistance as per Section 6.4

World Heritage Criteria[1]	Corresponding National Heritage Criteria	Potential Construction Impacts	Summary of Management Measures
Criterion VII – Rare Natural Phenomena Formations and Exceptional Natural Beauty • Vast mosaic patterns of reefs providing an unparalleled aerial panorama of seascapes and landscapes for example, Whitehaven Beach, Whitsunday islands, Hinchinbrook Island. • One of the few living structures visible from space. • Beneath the ocean surface, there is an abundance of shapes, sizes and colours, including spectacular coral assemblages (hard and soft corals) and >1500 species of fish. • Globally important breeding colonies of seabirds and marine turtles, including Raine Island, the world's largest green turtle breeding area • Superlative natural phenomena include the annual coral spawning, migrating whales, and significant spawning aggregations of many fish species.	**Criterion A – Process: Natural Phenomena, Formations, Features and Exceptional Beauty** **Criterion E – Aesthetics: Exhibiting Particular Aesthetics Valued by Community or Cultural Group**	Temporary impacts to islands of the GBR and the Queensland coastline in the event of a marine oil spill from a construction-related vessel. This may include oil covering beaches, or a vessel aground. Potential impacts include: • Impacts to marine ecosystems (e.g. seagrass, coral), this could include direct impacts such as smothering and indirect impacts such as light reduction. • Impacts to marine fauna through smothering from oil (seabirds affected by oil covering their feathers). • Indirect impacts to marine ecosystems through impact to food sources. Impacts to marine fauna (e.g. turtle or sea birds) which could include smothering of oil; inhalation or digestion of oil; reduction or loss of food source (eg seabirds unable to locate fish due to oil slick in water; smothering of seagrass meadows). Localised impacts as a result of grounding of a construction-related vessel on a reef structure. Potential impacts include: • Direct impact on marine ecosystems (eg seagrass, coral) including destruction of reef habitats.	Refer to management measures for World Heritage Criterion IX.
Criterion X – Habitats where Populations of Rare or Endangered Species Survive • One of the richest and most complex natural ecosystems on earth, and one of the most significant for biodiversity conservation. • Amazing diversity supports tens of thousands of marine and terrestrial species, many of which are of global conservation significance. • Some 39 species of mangroves comprising 54 per cent of the world's mangrove diversity. • ~ 43,000km^2 of seagrass meadows in both shallow and deep water areas, including 23 per cent of known global species diversity. • Habitat for one of the world's most important dugong populations and six of the world's seven species of marine turtle. • A breeding area for humpback whales, with at least 30 other species of whales and dolphins also identified. • 70 bioregions (broad-scale habitats) identified comprising 30 reef bioregions and 40 non-reefal bioregions; including algal and sponge gardens, sandy and muddy bottom communities, continental slopes and deep ocean troughs. • The reef bioregions contain one third of the world's soft coral and sea pen species (80 species). • 2000 species of sponges equalling 30 per cent of Australia's diversity in sponges. • 630 species of echinoderms (for example sea stars) equalling 13 per cent of the known global diversity.	**Criterion A – Process: Natural Phenomena, Formations, Features and Exceptional Beauty** **Criterion B – Rarity: Uncommon, Rare or Endangered Aspects of Australia's Natural or Cultural History** **Criterion C – Research: Yield Information to Contribute to an Understanding of Australia's Natural or Cultural History** **Criterion D – Characteristics: Principal Characteristics of Natural or Cultural Places or Environments**	Collisions and grounding, spills (including oil, cargo and waste), operational discharges, vessel strike, underwater noise and marine pest introductions have the potential to impact on the health of GBR habitats and associated species. Potential impacts include: • Impacts to marine fauna (e.g. turtle or sea birds) which could include smothering from oil; inhalation or digestion of oil; reduction or loss of food source (eg seabirds unable to locate fish due to oil slick in water; smothering of seagrass meadows). • Impacts to marine ecosystems (e.g. seagrass, coral), this could include direct impacts such as smothering and/or indirect impacts such as light reduction. • Impacts on spawning events (e.g. coral, fish) reducing the spawning success of species. • Changes in water quality impacting marine organisms e.g. reduction in light availability for photosynthetic organisms such as seagrass • Establishment of marine pests resulting in a change of habitat e.g. coral reef to mussel beds. This would remove food and habitat for other marine species. • Accumulation of potentially harmful chemicals which could affect species development and survival. • Impacts to marine fauna from underwater shipping noise (hearing loss, confusion and inability to locate group/pod). • Impacts to marine fauna from vessel strike.	Management measures to be implemented are provided in more detail in Section 6.3 to 6.7 of this Plan. Management measures for Criteria X include those identified for Criteria IX and the additional measures summarised below. **Construction Shipping Discharge and Waste Management for the GBRWHP and GBRNHP** Management measures for vessel discharges and waste depend on the type of waste generated by the vessel and are outlined in more detail in Section 6.5. All waste will be disposed of in accordance with national and international regulations. • All vessel equipment and machinery will receive regular maintenance. • Waste generated on board that cannot be treated and disposed of within regulations will be kept on board the vessel until a suitable facility or service is available for disposal. • All construction vessels will be vetted for condition and maintenance and survey history prior to contracting. **Construction Shipping Vessel Strike Management for the GBRWHP and GBRNHP** • Maintain a lookout for marine fauna when vessel is under way. • Consider reducing vessel speeds in areas where marine fauna have been sighted. • Consider modest course alteration away from the sightings. • Any injury or death of a listed species will be reported to the marine stranding hotline through the RSPCA Queensland on 1300 ANIMAL, Notification to DoE for cetacean death or injury within seven days of resulted activity (1800 803 732 or protected.species@environment.gov.au. • Large vessels will travel under pilotage (if required) and at

World Heritage Criteria[1]	Corresponding National Heritage Criteria	Potential Construction Impacts	Summary of Management Measures
			slower speeds in shallow or confined marine areas. **Construction Shipping Underwater Noise Management for the GBRWHP and GBRNHP** • All vessel equipment and machinery will receive regular maintenance • Where possible, vessels will avoid leaving vessel engines, thrusters and auxiliary plants in stand-by or running mode unnecessarily • Vessels to remain in the designated shipping lanes while transiting through the GBR • All vessel crew will be required to be fully qualified to the relevant IMO, AMSA and/or MSQ standards as applicable • Vessels will follow requirements for pilotage in areas where required • All construction vessels will be vetted for condition and maintenance and survey history prior to contracting.

1 – Information pertaining to the World Heritage Criteria Listing (values and attributes) extracted from GBRMPA (2011) Available at: http://www.gbrmpa.gov.au/about-the-reef/heritage/great-barrier-reef-world-heritage-area/criteria-values-and-attributes.

Table 6 Summary of Management Measures to be implemented for the GBRMP

Potential Construction Impact	Summary of Management Measures
Impacts to Marine Ecosystem Health, Function or Integrity	**Construction Shipping Management through the GBRMP** • Construction shipping activities through the GBR will be undertaken in accordance with the GBRMP Zoning Plan (GBRMPA 2003) or its most current version including: • The Inner GBR Designated Shipping Area will be used. • Pilots will be used for any vessels over 70m in length when transiting through the inner GBR Designated Shipping Area to the north of Cairns and the compulsory pilotage areas of the Torres Strait. • Real-time GPS (AIS) which is integrated into ReefVTS will be used for all vessels over 50m when transiting through the Inner GBR Designated Shipping Area. • Contractual and legislative requirement to comply with all relevant national and state legislation. • All vessels and submersible equipment new to the area will undergo a marine pest risk assessment prior to departing for site and an inspection if necessary. Should a marine pest incursion occur at the SoE all departing vessels will be required to comply with requirements enacted by the regulatory authorities implement Australia Emergency Marine Pest Plan. • RTAW will comply with requirements from findings of the North East Shipping Management Plan as part of adaptive management when appropriate. **Oil Spill Management of Construction Shipping through the GBRMP** • In the event of an incident that leads to an oil spill, the oil spill will be responded to in accordance with ReefPlan, QCCAP and the NATPLAN as applicable (Section 6.4). • Vessels will comply with Australian legislation to have an approved SOPEP, if required. Should a spill occur, the vessel master will try to contain the spill (if safe) and contact MSQ immediately to report and request assistance as per Section 6.4. **Construction Shipping Discharge and Waste Management for the GBRMP** Management measures for vessel discharges and waste depend on the type of waste generated by the vessel and are outlined in more detail in Section 6.3. • All waste will be disposed of in accordance with national and international regulations. • All vessel equipment and machinery will receive regular maintenance. • Waste generated on board that cannot be treated and disposed of within regulations will be kept on board the vessel until a suitable facility or service is available for disposal. • As per IMO, AMSA and MSQ requirements vessels will have the appropriate Plans and Records book eg Garbage Management Plan, Oil Record Book etc. • Through contractual arrangements all vessels will operate in accordance with international and domestic regulations pertaining to marine pollution. • All construction vessels will be vetted for condition and maintenance and survey history prior to contracting.
Impacts to Marine Species	**Construction Shipping Route through the GBRMP** • With the exception of anchorage, construction-related vessels will be mobile and offshore while within the GBRMP and not interfere with shallow water breeding areas or with nesting in marine turtle rookeries. **Oil Spill Management of Construction Shipping for the GBRMP** • Spills will be responded to in accordance with ReefPlan, QCCAP and the NATPlan for Maritime Emergencies as applicable (Section 6.4) • Vessels will comply with Australian legislation to have an approved SOPEP, if required.

Potential Construction Impact	Summary of Management Measures
	Should a spill occur, the vessel master will try to contain the spill (if safe) and contact MSQ immediately to report and request assistance as per Section 6.4. **Construction Shipping Discharge and Waste Management for the GBRMP** Management measures for vessel discharges and waste depend on the type of waste generated by the vessel and are outlined in more detail in Section 6.3. • All waste will be disposed of in accordance with national and international regulations. • All vessel equipment and machinery will receive regular maintenance. • Waste generated on board that cannot be treated and disposed of within regulations will be kept on board the vessel until a suitable facility or service is available for disposal. • As per IMO, AMSA and MSQ requirements vessels will have the appropriate Plans and Records book eg Garbage Management Plan, Oil Record Book etc. • Through contractual arrangements all vessels will operate in accordance with international and domestic regulations pertaining to marine pollution. • All construction vessels will be vetted for condition and maintenance and survey history prior to contracting. **Construction Shipping Underwater Noise Management for the GBRMP** • All vessel equipment and machinery will receive regular maintenance • Where possible, leaving vessel engines, thrusters and auxiliary plants in stand-by or running mode unnecessarily will be avoided. • Vessels to remain in the designated shipping lanes while transiting through the GBR. • All vessel crew will be required to be fully qualified to the relevant IMO, AMSA and/or MSQ standards as applicable. • Vessels will follow requirements for pilotage in areas where required. • All construction vessels will be vetted for condition and maintenance and survey history prior to contracting. **Construction Shipping Vessel Strike Management for the GBRMP** • Maintain a lookout for marine fauna when the vessel is underway. • Consider reducing vessel speeds in areas where marine fauna have been sighted. • Consider reducing vessel speed or course alteration consistent with AMSA Marine Notice 12/2011 Division 8.1 of the EPBC Regulations when listed species are sighted. • Any injury or death of listed species will be reported to the marine stranding hotline through the RSPCA Queensland on 1300 ANIMAL. • Notification to DoE for cetacean death or injury within seven days of resulted activity (1800 803 732 or protected.species@environment.gov.au. • Large vessels will travel more slowly and under pilotage (if required) in shallow or confined marine areas. **Management of Marine Pest Introduction to the GBRMP** • Management measures outlined below are presented in more detail in Section 6.7. • Vessels will comply with the Quarantine Act 1908 with all vessels from waters outside Australia coming to site will be assessed by DAFF on arrival to Australia. • All vessels and submersible equipment will undergo a risk assessment prior to arrival on site. • All vessels that are high risk are required to conduct additional management measures and a marine pest inspection by qualified and experienced personnel.
Changes in Water	Management measures to prevent degradation of water quality are detailed in Sections 6.1.3 to 6.7 of this Plan, a summary of these are provided below

Potential Construction Impact	Summary of Management Measures
Quality	**Construction Shipping Discharge and Waste Management for the GBRMP** Management measures for vessel discharges and waste depend on the type of waste generated by the vessel. Management measure include: • All waste will be disposed of in accordance with national and international regulations. • All vessel equipment and machinery will receive regular maintenance. • Waste generated on board that cannot be treated and disposed of within regulations will be kept on board the vessel until a suitable facility or service is available for disposal. • Through contractual arrangements all vessels will operate in accordance with international and domestic regulations pertaining to marine pollution. • All construction vessels will be vetted for condition and maintenance and survey history prior to contracting. **Construction Shipping Management for the GBRMP** Special provisions in the GBRMP are outlines in Section 4.1. Construction shipping activities through the GBR will be undertaken in accordance with the *GBRMP Zoning Plan* (Great Barrier Reef Marine Park Authority, 2003), or its most current version including:: • The existing shipping route which traverses the Inner GBR Designated Shipping Area will be used. • Pilots will be used for any vessels over 70m in length when transiting through the inner GBR Designated Shipping Area to the north of Cairns and the compulsory pilotage areas of the Torres Strait. • Real-time GPS (AIS) which is integrated into ReefVTS will be used for all vessels over 50m when transiting through the Inner GBR Designated Shipping Area. • Contractual requirement to comply with all relevant national and state legislation. • All vessels and submersible equipment new to the area will undergo a marine pest risk assessment prior to departing for site and an inspection if necessary. Should a marine pest incursion occur at the SoE all departing vessels will be required to comply with requirements enacted by the regulatory authorities implement Australia Emergency Marine Pest Plan. • RTAW will comply with requirements from findings of the North East Shipping Management Plan as part of adaptive management when appropriate. **Oil Spill Management of Construction Shipping for the GBRMP** • In the event of an incident that leads to an oil spill, the oil spill will be responded to in accordance with ReefPlan, QCCAP and the NATPLAN as applicable. Should a spill occur, the vessel master will try to contain the spill (if safe) and contact MSQ immediately to report and request assistance as per Section 6.4. • Vessels will comply with Australian legislation to have an approved SOPEP, if required.
Impact on Heritage Values	**Construction Shipping Management for the GBRMP** Special provisions in the GBRMP are outlines in Section 4.1. Construction shipping activities through the GBR will comply with the *GBRMP Zoning Plan* (GBRMPA 2003; or current version) including the following measures: • The existing shipping route which traverses the Inner GBR Designated Shipping Area will be used. • Pilots will be used for any vessels over 70m in length when transiting through the inner GBR Designated Shipping Area to the north of Cairns and the compulsory pilotage areas of the Torres Strait. • Real-time GPS (AIS) which is integrated into ReefVTS will be used for all vessels over

Potential Construction Impact	Summary of Management Measures
	50m when transiting through the Inner GBR Designated Shipping Area. • Contractual requirement to comply with all relevant national and state legislation. • All vessels and submersible equipment new to the area will undergo a marine pest risk assessment prior to departing for site and an inspection if necessary. Should a marine pest incursion occur at the SoE all departing vessels will be required to comply with requirements enacted by the regulatory authorities implement Australia Emergency Marine Pest Plan. • RTAW will comply with requirements from findings of the North East Shipping Management Plan as part of adaptive management when appropriate.

7 ACTION PLANS

Table 7 to Table 9 provide action plans for each MNES (identified in Section 1.1) to implement the mitigation measures for each potential construction-related impact (identified in Section 6). Each action plan provides the following details:

- The current benchmark or baseline status of each MNES (if known)
- Desired outcomes and goals following mitigation
- Performance indicators
- Timeframes for implementation
- Corrective actions and contingency measures
- Roles and responsibilities for implementation.

Table 7 Action Plan for Marine Turtles, Cetaceans and Dugong

Potential Impact	Benchmarks/Baseline	Desired Outcomes and Goals	Performance Indicators	Timeframes for implementation	Corrective actions and contingency	Responsibility
Physical Disturbance to Benthic, Intertidal Habitats or Beach Habitats	Construction as per that identified in the approved plan	Physical disturbance to seabed from construction of the marine infrastructure is restricted to the area identified in the approved plan	Area of seabed disturbed during construction that is outside the approved area of disturbance	During the construction of the Port, Barge and Ferry terminals and the Temporary Barge Terminal and Temporary Passenger Jetty.	Area to be surveyed after construction to ensure compliance with designated footprint. Breaches are to be reported, investigated and remedied if possible. Corrective actions will aim to be implemented within 12 months.	Design – Construction Manager
	Original profile (no Temporary Barge Terminal or Temporary Passenger Jetty)	Physical disturbance to benthic or intertidal habitats is restricted to the area outlined in the Decommissioning Plan for the Temporary Barge Terminal and Temporary Passenger Jetty during its removal. All Temporary Barge Terminal and Temporary Passenger Jetty infrastructure is removed when no longer required.	Area of benthic or intertidal habitats disturbed during decommissioning outside the footprint of the Temporary Barge Terminal and Temporary Passenger Jetty. Amount of infrastructure left after the Temporary Barge Terminal and Temporary Passenger Jetty are removed.	During removal of the Temporary Barge Terminal and Temporary Passenger Jetty	Area to be surveyed while decommissioning to ensure removal of material. If piles cannot be removed they will be cut off below the surface. Decommissioning of temporary facilities will occur within 6 months of cessation of use of the facility.	Removal of infrastructure – Construction Manager Inspection of removal of infrastructure – Construction Manager
	Original profiles and extents	Physical disturbance by anchoring is restricted to offshore	Area of seabed disturbed during construction	During the construction of the Port, Barge and Ferry terminals and the Temporary Barge Terminal and Temporary Passenger Jetty infrastructure	Vessels anchored in sensitive areas will move out of the area when possible. Sensitive areas will be identified to all vessel skippers so they are aware.	Marine Contractor
	Original profiles and no damage	No damage/physical disturbance from collisions or grounding of vessels.	Area of benthic or intertidal habitat	During the construction of the Port, Barge and Ferry terminals and the Temporary Barge Terminal and Temporary Passenger Jetty infrastructure	Large disturbances (eg collisions or groundings) to be investigated (within 48 hours of notification) and appropriate corrective actions implemented if possible.	Marine Contractor
	Original nests as laid by turtles	Zero marine turtle nests that have not been predated by feral pigs are disturbed during the construction of the piles for the wharf at Boyd Port or construction of the Temporary Barge Terminal and Temporary Passenger Jetty infrastructure. If marine turtle nests that have not been predated by feral pigs are found in the footprint of the Boyd Port wharf piles on the beach or the Temporary Barge Terminal and Temporary Passenger Jetty infrastructure prior to their construction, the state regulator is consulted to evaluate options for the relocation of nests to a distance outside the potential zone of impact.	Number of marine turtle nests that have not been predated by feral pigs that are unintentionally disturbed during the construction of the Boyd Port wharf piles on the beach or the Temporary Barge Terminal and Temporary Passenger Jetty Infrastructure. Percentage of marine turtle nests that have been identified to be moved that have been relocated.	During the construction of the piles for the wharf or beaches for construction activities	Any unintentional nest disturbance due to construction activities is to be investigated (within 48 hours of notification) and appropriate corrective actions implemented within 5 business days.	Barricade construction footprint – Construction Manager Training and awareness – Construction Manager Consultation with state regulator and relocation of nests – Environmental Specialist

Potential Impact	Benchmarks/Baseline	Desired Outcomes and Goals	Performance Indicators	Timeframes for implementation	Corrective actions and contingency	Responsibility
	Original nests as laid by turtles	The disturbance of marine turtle nesting habitat is minimised.	Disturbance footprints of the Boyd Port wharf and the Temporary Barge Terminal and Temporary Passenger Jetty infrastructure are as per approved plans.	During the construction of the piles for the wharf at Boyd Port or construction of the Temporary Barge Terminal and Temporary Passenger Jetty infrastructure.	Area to be reviewed during construction to ensure compliance with designated footprint. Breaches to be investigated and appropriate corrective actions implemented. Breaches to be investigated (within 48 hours of notification) and appropriate corrective actions implemented within 5 business days. Increase training and awareness if required.	Design – Construction Manager Surveys – Construction Manager Implementation of foreshore access permit system – Construction Manager Training and awareness – Construction Manager
Physical Disturbance to Beach Habitats associated with decommissioning the Temporary Barge Terminal and Temporary Passenger Jetty	Decommissioning Plan for the Temporary Barge Terminal and Temporary Passenger Jetty	All Temporary Barge Terminal and Temporary Passenger Jetty infrastructure is removed when no longer required.	Amount of infrastructure left after the Temporary Barge Terminal and Temporary Passenger Jetty are removed.	Timing from when Temporary Barge Terminal and Temporary Passenger Jetty are no longer required to when it is removed.	Area to be surveyed while decommissioning to ensure removal of material. If piles cannot be removed they will be cut off below the surface. Decommissioning of temporary facilities will occur within 6 months of cessation of use of the facility.	Removal of infrastructure – Construction Manager Inspection of removal of infrastructure – Construction Manager
Changes to Recreational Use of Beaches	Foreshore Access Permit System	No marine turtle nests disturbed associated with recreational use of the beach by the construction workforce.	Number of disturbed nests associated with recreational use of the beach by the construction workforce.	During construction.	**Impact Mitigation Measures-** Foreshore Access Permit System Disturbed turtle nests or reports of workers disturbing nests are to be investigated and appropriate disciplinary action undertaken within 5 business days Change Camp Code of Conduct if required. Increase training and awareness if required.	Foreshore access permit system implementation – Construction Manager Training and awareness – Construction Manager Enforcement of camp Code of Conduct – Construction Manager
Underwater Acoustic Impacts from Pile Driving	Exclusion zones as per conditions in EPBC approval for piling	Pile-driving operations always cease within two minutes of a listed species being observed in the exclusion zone. Pile driving does not recommence unless the animal is sighted leaving the exclusion zone or has not been sighted for 30 minutes. Soft start approach to piling.	Number of incidents where pile-driving operations did not cease within two minutes of a listed species being observed in the exclusion zone that were not safety related. Number of times pile driving recommenced before the animal is sighted leaving the exclusion zone or has not been sighted for 30 minutes.	During all pile-driving activities.	Pile driving non-conformances are to be investigated and appropriate corrective actions implemented within 48 hours	Marine Contractor SoE Project Team Project Manager

Potential Impact	Benchmarks/Baseline	Desired Outcomes and Goals	Performance Indicators	Timeframes for implementation	Corrective actions and contingency	Responsibility
Underwater Acoustic Impacts from Construction-related Shipping	Construction Shipping Contracts	All construction-related shipping has the appropriate mitigation measures applied to reduce underwater noise. Contracted construction-related shipping has appropriate underwater noise mitigation measures included in their contract.	Percentage of construction-related shipping that does not have the appropriate mitigation measures applied to reduce underwater noise. Percentage of contracted construction-related shipping that are not appropriately vetted	During construction shipping activities.	Monthly inspections s to check regular maintenance is being conducted on construction-related shipping. Breaches to be investigated and appropriate corrective actions implemented within 5 business days, where practicable.	Marine Contractor Vessel Master SoE Project Team Project Manager
Predation by feral pigs	Feral pig predation rates on marine turtle nests	Refer Feral Pig Management Offset Strategy – this is a compensatory measure to increase hatchling survivorship	Refer Feral Pig Management Offset Strategy	The Feral Pig Management Offset Strategy is to be submitted for the Minister's approval at least 6 months prior to the commencement of the action and implemented once it has been approved by the Minister.	**Impact Mitigation Measure-** Implementation of the Feral Pig Management Offset Strategy as outlined in program. .	Feral Pig Management Offset Strategy –Environmental Specialist
Altered Light Regime	Light horizon prior to construction activities	No records of marine turtles and/or their hatchlings aggregating around construction-related shipping.	Incidence of marine turtles and/or their hatchlings aggregating around construction-related shipping.	During construction shipping activities.	Records of turtles being impacted by lighting are to be investigated within 48 hours and appropriate corrective actions implemented within 10 business days. Increase training and awareness if required.	Marine Contractor
Marine Oil Spill	*Annex I – Oil of International Convention for the Prevention of Pollution from Ships 1973/1978* (MARPOL requirements) NATPLAN (AMSA ND) Queensland Coastal Contingency Action Plan (QCCAP; DTMR 2014a)	Zero oil spills. If a spill occurs, all marine oil spills are responded to and cleaned up in a timely manner. Zero non-compliance with *Annex I – Oil of International Convention for the Prevention of Pollution from Ships 1973/1978* (MARPOL requirements). Zero non-compliance with *NATPLAN and QCCAP.*	Number and volume of marine oil spills from construction-related shipping. Number of non-compliances with legislative requirements. Marine oil spills from construction-related shipping cleaned up in a timely manner.	During construction shipping activities.	Immediately implement appropriate spill response measures and comply with agency requests Any spills or discharges of wastes to be reported and appropriate corrective actions implemented. Breaches to be investigated and appropriate corrective actions implemented. Increase training and awareness if required.	Marine Contractor SoE Project Team Project Manager MSQ RTAW Emergency Response
Vessel Discharges and Waste	International Convention for the Prevention of Pollution from Ships (MARPOL) and related Annexes *International convention on the control of harmful anti-fouling systems on ships, 2001* (AFS Convention) Queensland *Transport Operations (Marine Pollution) Act 1995* (TOMPA) and the *Transport Operations (Marine Pollution) Regulation 2008*	No illegal vessel discharges from construction-related shipping All waste disposed of in accordance with national and international regulations Zero non-compliance with marine pollution regulations	Number and quantity of vessel discharges from construction-related shipping. Number of non-compliances with national and international regulations Beach condition during marine debris monitoring	During construction shipping activities.	Immediately implement appropriate spill response measures and comply with agency requests Any spills or discharges of wastes to be reported and appropriate corrective actions implemented. Breaches to be investigated and appropriate corrective actions implemented. Implement beach clean-up, as necessary Increase training and awareness if required.	Marine Contractor SoE Project Team Project Manager

Potential Impact	Benchmarks/Baseline	Desired Outcomes and Goals	Performance Indicators	Timeframes for implementation	Corrective actions and contingency	Responsibility
Vessel Freight/ Transportation	IMO regulations for transport of dangerous goods AMSA marine orders relating to cargo and freight International Convention for the Safety of Life at Sea (SOLAS) 1974	No spillage of vessel freight in particular dangerous goods and liquid chemicals.	Number of non-compliances with national and international regulations	During construction shipping activities.	Immediately implement appropriate spill response measures and comply with agency requests Any spills or discharges of wastes to be reported and appropriate corrective actions implemented. Breaches to be investigated and appropriate corrective actions implemented. Increase training and awareness if required.	Marine Contractor
Vessel Strike	Vessel Speed Requirements Specified Transit Lanes AMSA Marine Notice 12/2011 Division 8.1 of the EPBC Regulations IMO *Guidance document for minimising the risk of ship strikes with cetaceans, MEPC.1/Circ.674, dated 31 July 2009.*	Zero marine fauna vessel strikes associated with construction-related shipping. Construction-related shipping adheres to vessel speed requirements near port areas and in shallow water. Ferries and barges in the Hey and Embley Rivers travel along the specified transit lanes that follow the greatest water depths. Ferries and barges in the Hey and Embley slow to 6 knots in water depths of 2.5m or less. Compliance with management measures.	Zero marine fauna vessel strikes associated with construction-related shipping. Number of non-compliances with vessel speed requirements (including ferries and barges not slowing to 6 knots in water depths of 2.5m or less). Number of times ferries and barges do not follow specified transit lanes.	During construction shipping activities	Any injured or dead listed species will be reported to marine stranding hotline through RSPCA Queensland on 1300 ANIMAL as soon as practicable. Notification to DoE for cetacean death or injury within seven days of resulted activity (1800 803 732 or protected.species@environment.gov.au Any incidents to be reported immediately to the Company and appropriate corrective actions implemented. Breaches to be investigated and appropriate discipline actions implemented. Increased training and awareness if required.	Marine Contractor SoE Project Team Project Manager
Marine Pest Establishment	*Quarantine Act 1908* IMO Ballast water and biofouling management guidelines Existing environment	No marine pests established in the Port of Weipa as a result of construction-related shipping. Zero non-compliance with *Quarantine Regulations 2000*. No marine pest incursions during the construction phase of the SoE Project.	Number of marine pests species established in the Port of Weipa as a result of construction-related shipping. Number of non-compliances with *Quarantine Regulations 2000.*	During construction shipping activities.	Any incursions of a suspected or identified marine pest will be reported to Company as soon as practicable. Where possible appropriate corrective actions will be implemented within 5 business days Review of current marine pest assessment practices and amend as necessary within 30 days of incursion. Increase training and awareness if required.	Marine Contractor SoE Project Team Project Manager Environmental Specialists

Table 8 Action Plan for GBRWHP and GBRNHP

Related Potential Impacts	Benchmarks/Baseline	Desired Outcomes and Goals	Performance Indicators	Timeframes for implementation	Corrective actions and contingency	Responsibility
Potential Impacts on World Heritage Criteria IX, VII and X Potential Impacts on National Heritage Criteria A, B, C, D and E.	*Navigation Act 1912.* *Protection of the Sea (Prevention of Pollution from Ship) Act 1983.* International Convention for the Safety of Life at Sea (SOLAS) 1974 Convention on the International Regulations Preventing Collisions at Sea (COLREG) 1972	Zero collisions or groundings associated with construction-related shipping in the GBRWHP and GBRNHP. Zero construction-related shipping impacts on the values associated with World Heritage Criteria IX, VII and X. Zero construction-related shipping impacts on the values associated with National Heritage Criteria A, B, C, D and E.	Number of collisions or groundings associated with construction-related shipping in the GBRWHP and GBRNHP. Number of construction-related shipping impacts on the values associated with World Heritage Criteria IX, VII and X. Number of construction-related shipping impacts on the values associated with National Heritage Criteria A, B, C, D and E. Number of non-compliances with *Navigation Act 1912* and *Protection of the Sea*	During construction shipping activities in the GBRWHP and GBRNHP.	Immediately implement appropriate spill response measures and comply with agency requests. Increased training and awareness if required.	Marine Contractor SoE Project Team Project Manager

Related Potential Impacts	Benchmarks/Baseline	Desired Outcomes and Goals	Performance Indicators	Timeframes for implementation	Corrective actions and contingency	Responsibility
		Zero non-compliances with national and international regulations	*(Prevention of Pollution from Ship) Act 1983.*			
Potential Impacts on World Heritage Criteria IX, VII and X. Potential Impacts on National Heritage Criteria A, B, C, D and E.	*Annex I – Oil of International Convention for the Prevention of Pollution from Ships 1973/1978* (MARPOL requirements) NATPLAN (AMSA ND) Queensland Coastal Contingency Action Plan (QCCAP; DTMR 2014a)	Zero oil spills. If a spill occurs, all marine oil spills are responded to and cleaned up in a timely manner. Zero non-compliance with *Annex I – Oil of International Convention for the Prevention of Pollution from Ships 1973/1978* (MARPOL requirements). Zero non-compliance with *NATPLAN and QCCAP.*	Number and volume of marine oil spills from construction-related shipping. Number of non-compliances with legislative requirements. Marine oil spills from construction-related shipping cleaned up in a timely manner.	During construction shipping activities.	Immediately implement appropriate spill response measures and comply with agency requests. Any spills or discharges of wastes to be reported and appropriate corrective actions implemented. Breaches to be investigated and appropriate corrective actions implemented. Increase training and awareness if required.	Marine Contractor MSQ
Potential Impacts on World Heritage Criterion IX Potential Impacts on National Heritage Criteria A, C and D.	*Quarantine Regulations 2000.* *Quarantine Act 1908* *IMO Guidelines for Ballast Water and Biofouling Management*	No new marine pest species established in the Port of Weipa that could potentially impact the GBRWHP and GBRNHP as a result of construction-related shipping. Zero non-compliance with *Quarantine Regulations 2000* and *Quarantine Act 1908* No marine pests found on foreign vessels during the construction phase of the SoE Project.	Zero marine pest species established in the Port of Weipa as a result of construction-related shipping. Number of non-compliances with *Quarantine Regulations 2000.* Number of non-compliances with *Protection of the Sea (Prevention of Pollution from Ships) Act 1983.* Number of marine pest species found on vessels working on the SoE Project during the construction phase of the Project.	During construction shipping activities in the GBRWHP and GBRNHP. During construction shipping activities from the Port of Weipa through the GBRWHP and GBRNHP	Marine pest incursion associated with the SoE Project are to be investigated within 48 hours and appropriate corrective actions implemented where possible	Marine Contractor SoE Project Team Project Manager
Potential Impacts on World Heritage Criterion X. Potential Impacts on National Heritage Criteria A, B, C and D.	International Convention for the Prevention of Pollution from Ships (MARPOL) *Transport Operations (Marine Pollution) Act 1995* (TOMPA) and the *Transport Operations (Marine Pollution) Regulation 2008* *International convention on the control of harmful anti-fouling systems on ships, 2001* (AFS Convention) *Protection of the Sea (Harmful Anti-fouling Systems) Act 2006*	Zero non-compliance with regulations	Number of discharge and waste non-compliances with MARPOL, AMSA and Australian legislative requirements.	During construction shipping activities in the GBRWHP and/or GBRNHP.	Immediately implement appropriate spill response measures and comply with agency requests Any spills or discharges of wastes to be reported and appropriate corrective actions implemented. Breaches to be investigated and appropriate corrective actions implemented. Increase training and awareness if required.	Marine Contractor SoE Project Team Project Manager
Potential Impacts on World Heritage Criterion X.	IMO *Guidance document for minimising the risk of ship strikes with cetaceans, MEPC.1/Circ.674,*	Zero marine fauna vessel strikes associated with construction-related shipping	Zero marine fauna vessel strikes associated with construction-related shipping.	During construction shipping activities	Any injured or dead listed species will be reported to marine stranding hotline through RSPCA Queensland on 1300 ANIMAL as soon as practicable.	Marine Contractor SoE Project Team

Related Potential Impacts	Benchmarks/Baseline	Desired Outcomes and Goals	Performance Indicators	Timeframes for implementation	Corrective actions and contingency	Responsibility
Potential Impacts on National Heritage Criteria A, B, C and D.	*dated 31 July 2009.* Division 8.1 of the EPBC Regulations 2000 regarding vessel interactions with cetaceans. AMSA Marine Notice 12/2001	Construction-related shipping adheres to vessel speed requirements near port areas and in shallow water Compliance with management measures			Notification to DoE for cetacean death or injury within seven days of resulted activity (1800 803 732 or protected.species@environment.gov.au Any incidents to be reported immediately to the Company and appropriate corrective actions implemented. Breaches to be investigated and appropriate discipline actions implemented. Increased training and awareness if required.	Project Manager
Potential Impacts on World Heritage Criterion X. Potential Impacts on National Heritage Criteria A, B, C and D.	*IMO Guidelines for the reduction of underwater noise from commercial shipping to address adverse impacts on marine life, MEPC.1/Circ.833, dated 7 April 2014*.	All construction-related shipping has the appropriate mitigation measures applied to reduce underwater noise. Contracted construction-related shipping has appropriate underwater noise mitigation measures included in their contract.	Percentage of construction vessels that receive regular maintenance and comply with vessel speeds. Percentage of contracted construction-related shipping that is appropriately vetted for appropriate underwater noise mitigation measures.	During construction shipping activities	Monthly inspection to be conducted for compliance with maintenance and vessel speeds, any breaches will be investigated and appropriate corrective actions implemented within 5 business days, where practicable.	Marine Contractor SoE Project Team Project Manager
Potential Impacts on World Heritage Criterion X. Potential Impacts on National Heritage Criteria A, B, C and D. Potential Impacts on National Heritage Criteria B, C and D.	*Quarantine Regulations 2000.* *Quarantine Act 1908* *IMO Guidelines for Ballast Water and Biofouling Management*	No new marine pest species established in the GBRWHP and/or GBRNHP as a result of construction-related shipping. Zero non-compliance with *Quarantine Regulations 2000* and *Quarantine Act 1908.* No marine pests found on foreign vessels during the construction phase of the SoE Project.	Number of marine pest species established in the GBRWHP and GBRNHP as a result of construction-related shipping. Number of non-compliances with *Quarantine Regulations 2000.* Number of non-compliances with *Protection of the Sea (Prevention of Pollution from Ships) Act 1983.* Number of marine pest species found on vessels during the construction phase of the Project.	During construction shipping activities in the GBRWHP and GBRNHP. During construction shipping activities from the Port of Weipa.	Review current marine pest assessment practices and amend as necessary within ten business days of an incursion. Increase training and awareness if required.	Marine Contractor SoE Project Team Project Manager

Table 9 Action Plan for GBRMP

Related Potential Impacts	Benchmarks/Baseline	Desired Outcomes and Goals	Performance Indicators	Timeframes for implementation	Corrective actions and contingency	Responsibility
Impacts to Marine Ecosystem Health, Function or Integrity	*Navigation Act 1912.* *Protection of the Sea (Prevention of Pollution from Ship) Act 1983* *Great Barrier Reef Marine Park Zoning Plan, 2003* International Convention for the Safety of Life at Sea (SOLAS) 1974 Convention on the International Regulations Preventing Collisions at Sea (COLREG) 1972	Zero collisions or groundings associated with construction-related shipping in the GBRMP. Zero construction-related shipping impacts on the values associated with the GBRMP. Zero non-compliances with *Navigation Act 1912.* Zero non-compliances with *Protection of the Sea (Prevention of Pollution from Ship) Act 1983.*	Number of collisions or groundings associated with construction-related shipping in the GBRMP. Number of construction-related shipping impacts on the values associated with the GBRMP. Number of non-compliances with *Navigation Act 1912* and *Protection of the Sea (Prevention of Pollution from Ship) Act 1983.*	During construction shipping activities in the GBRMP.	Immediate implementation of management measures for construction shipping in the GBRMP. Increased training and awareness if required. Corrective action for any non-compliance under construction shipping contracts. Access to the AMSA ETV, the *Pacific Responder* in the event of a collision or grounding. Increase training and awareness if required.	Marine Contractor SoE Project Team Project Manager
Impacts on Marine Ecosystem Health, Function or Integrity	*Annex I – Oil of International Convention for the Prevention of Pollution from Ships 1973/1978* (MARPOL requirements) NATPLAN (AMSA ND) Queensland Coastal Contingency Action Plan (QCCAP; DTMR 2014a)	Zero oil spills. If a spill occurs, all marine oil spills are responded to and cleaned up in a timely manner. Zero non-compliance with *Annex I – Oil of International Convention for the Prevention of Pollution from Ships 1973/1978* (MARPOL requirements). Zero non-compliance with *NATPLAN and QCCAP.*	Number and volume of marine oil spills from construction-related shipping. Number of non-compliances with legislative requirements. Marine oil spills from construction-related shipping cleaned up in a timely manner.	During construction shipping activities.	Immediately implement appropriate spill management measures and comply with agency requests. Any spills or discharges to be reported and appropriate corrective actions implemented. Breaches to be investigated and appropriate corrective actions implemented. Increase training and awareness if required.	Marine Contractor MSQ
Impacts on Marine Ecosystem Health, Function or Integrity	International Convention for the Prevention of Pollution from Ships (MARPOL) *Transport Operations (Marine Pollution) Act 1995* (TOMPA) and the *Transport Operations (Marine Pollution) Regulation 2008* *International convention on the control of harmful anti-fouling systems on ships, 2001* (AFS Convention) *Protection of the Sea (Harmful Anti-fouling Systems) Act 2006*	Zero non-compliance with regulations.	Number of discharge and waste non-compliances with MARPOL, AMSA and Australian legislative requirements.	During construction shipping activities in the GBRWHP and/or GBRNHP.	Immediately implement appropriate spill management measures and comply with agency requests. Any spills or discharges to be reported and appropriate corrective actions implemented. Breaches to be investigated and appropriate corrective actions implemented. Increase training and awareness if required.	Marine Contractor SoE Project Team Project Manager

Related Potential Impacts	Benchmarks/Baseline	Desired Outcomes and Goals	Performance Indicators	Timeframes for implementation	Corrective actions and contingency	Responsibility
Impacts to Marine Species	Designated Shipping Routes	Construction-related vessels do not deviate from designated shipping routes.	Number to times construction-related vessels deviate from designated shipping routes.	During construction shipping activities in the GBRMP.	Implementation of management measures for construction shipping in the GBRMP. Increased training and awareness if required. Corrective action for any non-compliance under construction shipping contracts.	Marine Contractor SoE Project Team Project Manager
Impacts on Marine Species	IMO *Guidance document for minimising the risk of ship strikes with cetaceans, MEPC.1/Circ.674, dated 31 July 2009.* *Division 8.1 of the EPBC Regulations 2000 regarding vessel interactions with cetaceans.* AMSA Marine Notice 12/2001 Vessel Speed Requirements in the GBRMP.	Zero marine fauna vessel strikes associated with construction-related shipping in the GBRMP. Construction-related shipping adheres to vessel speed requirements in the GBRMP, especially near port areas and in shallow water. Contracted construction-related shipping has appropriate vessel strike mitigation measures included in their contract.	Zero marine fauna vessel strikes associated with construction-related shipping in the GBRMP. Number of non-compliances with vessel speed requirements in the GBRMP.	During construction shipping activities in the GBRMP.	Any injured or dead listed species will be reported to marine stranding hotline through RSPCA Queensland on 1300 ANIMAL as soon as practicable. Notification to DoE for cetacean death or injury within seven days of resulted activity (1800 803 732 or protected.species@environment.gov.au Any incidents to be reported immediately to the Company and appropriate corrective actions implemented. Breaches to be investigated and appropriate discipline actions implemented. Increased training and awareness if required.	Marine Contractors SoE Project Team Project Manager
Impacts on Marine Species	*IMO Guidelines for the reduction of underwater noise from commercial shipping to address adverse impacts on marine life, MEPC.1/Circ.833, dated 7 April 2014*.	Construction-related vessels do not deviate from designated shipping route through the GBRMP. All construction-related shipping traversing through the GBRMP has the appropriate mitigation measures applied to reduce underwater noise. Contracted construction-related shipping has appropriate underwater noise mitigation measures included in their contract.	Number of construction-related shipping traversing through the GBRMP that have the appropriate mitigation measures applied to reduce underwater noise. Number of contracted construction-related shipping that have appropriate underwater noise mitigation measures included in their contract.	During construction shipping activities in the GBRMP.	Random audits to check regular maintenance is being conducted on construction-related shipping. Breaches to be investigated and appropriate corrective actions implemented within 10 business days, where practicable.	Marine Contractors SoE Project Team Project Manager
Changes in Water Quality	Construction Shipping Contracts	Zero collisions or groundings associated with construction-related shipping in the GBRMP. Zero marine oil spills in the GBRMP. No spillage of loads into the GBRMP from construction-related shipments.	Number of loads spilled in the GBRMP from construction-related shipments.	During construction shipping activities in the GBRMP.	Immediately implement appropriate spill management measures and comply with agency requests. Any spills or discharges to be reported and appropriate corrective actions implemented. Breaches to be investigated and appropriate corrective actions implemented. Increase training and awareness if required.	Vessel Master Marine Contractor
Marine Pest Establishment	*Quarantine Regulations 2000*. *Protection of the Sea (Prevention of*	No new marine pest species established in the GBRMP as a result of construction-related	Number of marine pest spread to the GBRMP as a result of construction-	During construction shipping activities in	Any pest incursions related to the SoE Project will be reported to Company immediately and where possible appropriate corrective actions will be	Vessel Master Marine Contractors

Related Potential Impacts	Benchmarks/Baseline	Desired Outcomes and Goals	Performance Indicators	Timeframes for implementation	Corrective actions and contingency	Responsibility
	Pollution from Ships) Act 1983.	shipping. Zero non-compliance with *Quarantine Regulations 2000*. Zero non-compliance with *Protection of the Sea (Prevention of Pollution from Ships) Act 1983*.	related shipping. Number of non-compliances with *Quarantine Regulations 2000.* Number of non-compliances with *Protection of the Sea (Prevention of Pollution from Ships) Act 1983.*	the GBRMP. During construction shipping activities from the Port of Weipa through the GBRMP.	implemented within 5 business days Review of current marine pest assessment practices and amend as necessary within 30 days of incursion.	SoE Project Team Project Manager Environmental Specialists
Impact on Heritage Values	*Great Barrier Reef Marine Park Zoning Plan, 2003*	No impact to the heritage values of the GBRMP.	Construction shipping activities undertaken in accordance with management measures outlined in plan	During construction shipping activities in the GBRMP.	Corrective action for any non-compliance under construction shipping contracts as soon as practicable.	Vessel Master Marine Contractors SoE Project Team Project Manager

8 MONITORING AND REPORTING

Monitoring and reporting are required under the EPBC and EA approval conditions as well as RTAW's ISO14001 certified Environmental Management Systems. This section summarises the monitoring and reporting requirements of this Plan.

8.1. Piling Observation Zone Monitoring

Observations of listed species within the designated observation zones (see Table 2) will be conducted by suitably qualified marine observers as described in Section 6.1. Every 30 days during periods when pile-driving operations are occurring, the number of incidents where pile-driving operations did not cease within two minutes after listed species were observed within the 100m exclusion zone will be reported to the DoE. Records will be kept of all marine observers contracted by the Project.

8.2. Marine Pest Monitoring

A marine pest monitoring program will be developed and implemented by the Project. Monitoring will consist of:

- a baseline survey of the SoE Project area and Port of Weipa[8];
- larval settlement plate monitoring In the Amrun Area for sessile marine pest species on the CCIMPE trigger lis[9]t; and
- a post-construction survey of the Amrun Area and Port of Weipa.

The marine pest monitoring program will be consistent with the National System for the Prevention and Management of Marine Pest Incursions, and the most current versions of the *Australian Marine Pest Monitoring Manual* (DAFF, 2010a) and the *Australian Marine Pest Monitoring Guidelines* (DAFF, 2010b).

The baseline and post-construction surveys will be based upon the methods used in the 1999 marine pest survey conducted in the Port of Weipa (Hoedt *et al.*, 2001). The Australian pest monitoring manual and guidelines, however, were not available in 1999, so the survey methods will be modified to be consistent with those documents. Survey design and reporting will use the monitoring design Excel template (MDET) and the monitoring design report template (MDRT), tools that were developed by the National System to support the monitoring manual and guidelines.

In addition to dedicated marine pest monitoring, construction personnel assigned to coastal marine facilities will receive induction information on readily observed marine pests,

[8] Baseline marine pest survey was completed in December 2015

[9] Larval settlement plate monitoring has been conducted quarterly in the Amrun area since February 2016

including the Asian green mussel, Asian bag mussel and black-striped mussel, and instructed to report suspected observations of these species through their line managers.

No monitoring is currently proposed to be completed at Aurukun due to the very low risk. A minimal number of vessels are scheduled to use Aurukun, with vessels unlikely to stay for longer than 24 hours. Should higher usage of Aurukun be proposed monitoring will be extended to Aurukun boat ramp.

8.3. Marine Turtle Nest Surveys

Ten days prior to any disturbance of the beach for construction of Amrun Port during turtle nesting and hatchling season, visual surveys of marine turtle crawls and nests will be conducted within 100m of the disturbance footprint. These surveys will continue daily until construction activities on the beach are completed or turtle nesting and hatchling season is complete. If nests that have not been predated by feral pigs are observed during the surveys, either (a) the active nest will be avoided during construction or (b) the EHP will be consulted to evaluate options for nest relocation to at least 100m outside the potential zone of impact. Exclusion markers will be installed around any active nests.

8.4. Elasmobranch Sightings

During construction, in accordance with Condition 6(l) of the EPBC approval, DoE will be notified within five business days of any confirmed or suspected observations by Project personnel of the following elasmobranch species:

- Dwarf Sawfish (*Pristis clavata*);
- Green Sawfish (*Pristis zijsron*);
- Freshwater Sawfish (*Pristis microdon*); and
- Speartooth Shark (*Glyphis* sp. A).

Construction personnel assigned to coastal marine facilities will receive induction information on these elasmobranch species, and instructed to report confirmed or suspected observations through their line managers. During piling activities, marine observers will receive a more detailed briefing, and daily field records will include a field to record any confirmed or suspected sightings in the observation zones. Any injured or dead individuals of these species observed within the observation zones will be reported to DoE.

8.5. Foreshore Access Permit System

Under the FAMP (see Section 1.2.6), procedures will be developed to monitor, respond to, investigate and report breaches in the permit system. These procedures will be part of the Project's health, safety and environmental management system.

8.6. Feral Pig Management Offset Strategy

A separate Feral Pig Management Offset Strategy (see Section 1.2.7) will include monitoring and reporting of turtle nests and feral pig control measures. Provisions for monitoring and reporting are included in this plan.

8.7. Inshore Dolphin Offset Strategy

Surveys targeting the Australian Snubfin Dolphin (*Orcaella heinsohni*), Indo-Pacific Humpback Dolphin (*Sousa chinensis*) will be conducted as part of the separate Inshore Dolphin Offset Strategy (see Section 1.2.8).

8.8. Beach Erosion Monitoring

Monthly visual inspections for beach erosion will occur when completing the monthly visual inspection for the Temporary Barge Facility.

8.9. Marine Debris Monitoring

Monthly visual inspections for marine debris during beach erosion monitoring will occur. The project will implement cleaning as necessary.

8.10. Other Reporting

8.10.1. Compliance and auditing

Monitoring, reporting and auditing of compliance with this Plan will be conducted as described in Section 5.2.

Condition 69 of the EPBC approval requires that an independent audit of compliance with the conditions of approval, and by extension with this Plan, be conducted by an independent auditor approved by the Minister. Criteria for the audit must be approved by the Minister prior to the audit, and the audit report must address the criteria and be submitted to the Minister.

8.10.2. Survey data and information

Reporting will be in compliance with condition 66 to 72 of the EPBC Approval. This includes:

- Annual reporting published on the RTAW website identifying compliance with the EPBC approval for the past 12 months must be completed within three months of every 12 month anniversary of the commencement date. Any non-compliance will be reported to DOE at the same tine of publication with the report provided to the minister.
- If requested by the DoE, all survey data and information related to this Plan and MNES will be submitted within 30 business days of the request, or within a time frame agreed by the DoE in writing, in accordance with Condition 56 of the EPBC approval.
- RTAW will also provide the survey data and related information within 30 business days to anyone who may request such information. All survey data and information related to this Plan and MNES will be made available to anyone who may request, within 30 business days. Notification of the availability of this information and data will be provided on the RTAW website.
- Once complete, all reports and related analysis of survey data required by this Plan will be published annually on the RTAW website in accordance with Condition 57 of the EPBC Act approval.

- This Plan will be published on the RTAW website in accordance with Condition 59 of the EPBC approval at the address below.

9 TRADITIONAL OWNER EMPLOYMENT OPPORTUNITIES

RTAW has committed to working collaboratively with Traditional Owners, through the relevant Western Cape Communities Co-existence Agreement (WCCCA) Sub-Committees and the WCCCA Coordinating Committee to further increase representation of local Aboriginal people, and in particular, the Wik & Wik Waya Traditional Owners across the workforce. For this reason, focussed work, in collaboration with Traditional Owners and the Members of the WCCCA Employment, Training, Environment and Heritage Sub-Committee will be undertaken, to understand the current challenges, the outcomes achieved to date and the development of strategies specific to the needs of this community.

In addition, RTAW Weipa as a signatory to the Western Cape Regional Partnership Agreement (RPA) is actively working with the RPA working group on employment and training to identify opportunities where industry, Governments and local Aboriginal people can strategically partner to develop relevant skills and employment pathways prior to and during the construction phase of the Amrun Project.

Traditional Owner employment opportunities associated with marine works and shipping will be available in the following Land and Sea Management Programmes, which are part of the Communities, Heritage and Environmental Management Plan (SoE Communities, Heritage and Environment Working Group, 2014):

- Feral Pig Management Offset Strategy;
- Foreshore Access Permit System;
- Inshore Dolphin Offset Strategy; and
- Marine Mammal Observations during piling activities.

In addition, through the existing Indigenous Land Use Agreement, opportunities for employment of Traditional Owners are identified through and employment and training plan. This plan identifies work opportunities and roles within these work opportunities that may be filled by Traditional Owners. Traditional Owners that may be capable of filling these roles are then identified with RTAW supporting identified candidates to become appropriately skilled to fill the identified roles. RTAW supports the employment of Traditional Owners if they are appropriately skilled and qualified to fulfil the role requirements.

As part of RTAW's reporting obligations under the Indigenous Land Use Agreement, quarterly review reports on Indigenous employment and training obligations are made to Traditional Owners.

10 TRADITIONAL OWNER CONSULTATION

Traditional Owners were consulted in accordance with the process under the Indigenous Land Use Agreement during the preparation of this Plan. This consultation involved the following:

- the Plan was lodged with the Western Cape Communities Coexistence Agreement (WCCCA) Coordinating Committee in November 2014;
- the Plan was subsequently presented to a meeting of the Communities, Heritage and Environment Management Plan (CHEMP) Working Group. No queries about the Plan were raised at the meeting. Members of the CHEMP Working Group were asked to provide any comments on the Plan within a few weeks. No comments were received;
- the presentation to the Working Group was then lodged with the WCCCA Coordinating Committee and which formally noted that the management plans had been presented to the Working Group.

11 REFERENCES

Australian Maritime Safety Authority. (2007). *National Plan to Combat the Pollution of Sea by Oil and Other Noxious and Hazardous Substances.*

Australian Maritime Safety Authority. (2011a). *National Marine Oil Spill Contingency Plan*. Australian Government. Canberra.

Australian Maritime Safety Authority. (2011b). *Minimising the risk of ships colliding with cetaceans*. Australian Government. Canberra.

Australian Maritime Safety Authority. (2013). *Technical Guidelines for the Preparation of Marine Pollution Contingency Plans for Marine and Coastal Facilities*. Australian Government. Canberra.

Australian Maritime Safety Authority. (no date). *National Plan for Maritime Environmental Emergencies*. Australian Government. Canberra.

Department of Environment and Heritage. (2006). Australian National Guidelines for Whale and Dolphin Watching http://www.environment.gov.au/system/files/resources/fed9ff86-0571-43ff-bb18-32205fc6a62c/files/whale-watching-guidelines-2005.pdfAtlas of Living Australia. (2012). *Pristis microdon, Pristis clavata,* and *Pristis zijsron* in Australia's Species Database, Atlas of Living Australia sharing biodiversity knowledge. Available online at: http://bie.ala.org.au/species/ (accessed 09/06/2012)

Biddle, T., Boyle, M., Limpus, C.J. (2011). Marine wildlife stranding and mortality database annual report 2009 and 2010, Dugong. Conservation Technical and Data Report 2010:1–59.

BMA. (2014) Environmental Management Plan (Marine Ecology) for Dredging and Dredged Material Disposal – Hay Point Coal Terminal Expansion Phase 3 (HPX3).

Commonwealth of Australia (2013) Seaports Program: Australian Ballast Water Management Requirements. Version 5. Department of Agriculture, Canberra

DAFF. (2005). Australian Emergency Marine Pest Plan (EMPPlan) Version 2.0. Control Centre Management Manual, 100 pp. Department of Agriculture, Fisheries and Forestry.

DAFF. (2011) Proposed Australian Biofouling Management Requirements Consultation Regulation Impact Statement

DAFF & SEWPaC, (2013) *Australian Anti-fouling and In-water Cleaning Guidelines* http://www.agriculture.gov.au/Style%20Library/Images/DAFF/__data/assets/pdffile/0020/2330570/antifouling-guidelines-june-2013.pdf

Department of the Environment. (2009). *National Assessment Guidelines for Dredging*. Australian Government. Canberra.

Department of Fisheries (WA). (2015) Vessel Check – Biofouling Risk Assessment Tool. https://vesselcheck.fish.wa.gov.au/

Department of Fisheries (WA). (ND) Good vessel maintenance

Department of Fisheries (WA). (2014). Western Australia Marine Pest Management Guidelines

Department of Primary Industries & Fisheries. (2002). QLD Seagrass Meadows 1984-1988 Coastal Habitat Resource Information System, http://chrisweb.dpi.qld.gov.au/CHRIS

Department of Transport and Main Roads (DTMR). (2014a). *Queensland Coastal Contingency Action Plan*. State Government. Queensland.

Department of Transport and Main Roads (DTMR). (2014b). *Port of Weipa – First-strike Oil Spill Response Plan (A supplement to the Queensland Coastal Contingency Action Plan)*. Maritime Services Branch. Maritime Safety Queensland. State Government. Queensland.

GHD. (2015). Report for Rio Tinto Alcan – *South of Embley Inshore Dolphin Project, December 2014 Baseline Survey.*

Great Barrier Reef Marine Park Authority. (2003). *Great Barrier Reef Marine Park Zoning Plan.*

Great Barrier Reef Marine Park Authority. (2015). Criteria values and Attributes - GBRMPA http://www.gbrmpa.gov.au/about-the-reef/heritage/great-barrier-reef-world-heritage-area/criteria-values-and-attributes

Greenland, J. A., & Limpus, C. J. (2004) Marine wildlife stranding and mortality database annual report 2004. I Dugong. Conservation Technical and Data Report 2004:1–29.

Greenland, J. A., & Limpus, C. J. (2006). Marine wildlife stranding and mortality database annual report 2006 I. Dugong. Conservation Technical and Data Report 2006 1: 1-25.

Greenland, J. A., & Limpus, C. J. (2008). Marine wildlife stranding and mortality database annual report 2008 I. Dugong. Conservation Technical and Data Report 2008 1: 1-25.

Hoedt, F.E., Choat, J.H., Cruz, J.J., Neil, K.M., & Collins, J. (2001a). Survey of the Port of Weipa: Port marine baseline surveys and surveys for introduced marine pests. CRC Reef Research Centre and James Cook University School of Marine Biology and Aquaculture. Report to Ports Corporation of Queensland.

IMO. (2005). *Guidelines for ballast water management, equivalent compliance (G3),* MEPC.123(53), dated 22 July 2005.

IMO. (2010). Manual on Oil Spill Risk Evaluation and Assessment of Response Preparedness. IMO Publication 1579E. IMO London.

IMO. (2011). 2011 guidelines for the control and management of ship's biofouling to minimize the transfer of invasive aquatic species, MEPC.207(62), dated 15 July 2011.

IMO. (2014). *Guidelines for the reduction of underwater noise from commercial shipping to address adverse impacts on marine life, MEPC.1/Circ.833, dated 7 April 2014*.

Limpus, C. J., Haines, J., & Flakus, S. (1999). Marine wildlife stranding and mortality database annual report, 1999, I. Dugong. Queensland Parks and Wildlife Service

Maritime Safety Queensland. (2015). *Guide for the prevention of ship-sourced pollution and for the safe transfer of bunkers in Queensland waters.* Department of Transport and Main Roads. State Government Queensland.

National System for the Prevention and Management of Marine Pest Incursions. (2009a). National biofouling management guidance for non-trading vessels. Department of Agriculture, Fisheries and Forestry.

National System for the Prevention and Management of Marine Pest Incursions. (2009b) National biofouling management guidance for commercial vessels. Department of Agriculture, Fisheries and Forestry.

National System for the Prevention and Management of Marine Pest Incursions. (2009c) National biofouling management guidance for the petroleum production and exploration industry. Department of Agriculture, Fisheries and Forestry.

National System for the Prevention and Management of Marine Pest Incursions. (2010a). Australian Marine Pest Monitoring Manual: Version 2.0. Department of Agriculture, Fisheries and Forestry.

National System for the Prevention and Management of Marine Pest Incursions. (2010b). Australian Marine Pest Monitoring Guidelines: Version 2.0. Department of Agriculture, Fisheries and Forestry.

NIMPIS. (2015a). Asian Green mussel outbreak in Cairns - 2007 http://www.marinepests.gov.au/pest_outbreaks/Pages/Asian-green-mussel-outbreak-in-Cairns.aspx

NIMPIS. (2015b). Black-striped mussel outbreak in Darwin – 1999 http://www.marinepests.gov.au/pest_outbreaks/Pages/Black-striped-mussel-outbreak-in-Darwin.aspx

North-East Shipping Management Group. (2014). *North-East Shipping Management Plan.*

NQBP (2012) Port Handbook Port of Weipa

RTA. (2013). South of Embley Project Environmental Impact Statement.

RTAW. (2014). Criteria for Marine Observers. Version 2, Approved Version 23 October 2014.

RTAW. (2015) Section 2 – Emergency Response Plan. Version 3.5 09/03/2015.

Saalfield, K. & Marsh, H. (2004). 'Dugong'. In: National Oceans Office, key species – A description of key species groups in the northern planning area, Chapter 10, pp97-114. National Oceans Office, Hobart.

SoE Communities, Heritage and Environment Working Group. (2014). *Communities, Heritage and Environmental Management Plan.* RTA Weipa Pty Ltd.

Appendix A Species Profiles for Threatened Marine Fauna

Marine Habitat Surveys

Biophysical and ecological data were collected to describe the existing marine and estuarine environment in the vicinity of the Project area. Benthic (sea floor) habitat surveys were completed within the Project area during October 2007, June 2008, November 2008, June 2009, July 2009, June 2010, and February 2012. A combination of towed video sled and drop camera video techniques and van Veen grab sampling were adopted for these studies.

A summary of benthic habitat surveys conducted is presented in Table A1.

Table A1 Summary of Marine and Estuarine Baseline Surveys

Baseline Data/Study	Boyd Port Area	Proposed New Spoil Ground	Hornibrook and Humbug Terminals	Hey River Terminal	Albatross Bay Spoil Ground
Water quality	✓	✓	✓	✓	✓
Sediment characteristics	✓	✓	✓	✓	
Physical environment and coastal processes	✓	✓			
Benthic habitat mapping – drop camera video	✓		✓	✓	
Benthic habitat mapping – towed video sled	✓	✓			
Mangrove survey	✓		✓	✓	
Marine Turtle survey	✓				
Piling underwater noise modelling	✓				
Project-related shipping impacts	✓				
Aquatic ecology baseline			✓	✓	

Detailed drop camera video and towed video sled techniques were used between Pera Head and Boyd Point (inclusive) to systematically survey sponge, soft coral and fringing hard coral reef habitats in the immediate vicinity of the Boyd Port area and new spoil ground footprint during October 2007 and June 2008. An additional video camera survey was undertaken in February 2012 at the temporary seaborne access areas and anchorage area.

The distribution of dominant reef habitat types (hard coral or soft-coral – sponge) between Boyd Point and Thud Point were determined through site inspection following inference from available bathymetric charts, bathymetric surveys commissioned by RTAW and aerial photography. Slope analysis overlain with detailed contour information was also applied to assist in the delineation of reef patches.

Drop camera video inspection was undertaken at Pera Head and Thud Point to assist in confirming the inferred presence of these reef areas. Detailed drop camera video surveys in

2007 and 2008 had already confirmed the extent of reef habitats at Pera Head and Boyd Point and Pera Head to Thud Point in June 2010.

Drop camera video inspection was also undertaken in June 2010 at Nine Mile Reef approximately 6km south south-west of the new spoil ground footprint.

Mangrove communities were surveyed to evaluate the likely sensitivity to potential changes in catchment flows associated with mining and infrastructure development. Surveys were conducted at points along the salinity gradient from the upper to lower estuary of both the Ward River and Norman Creek systems during May 2009. The objective of the survey was a qualitative assessment of mangrove community composition and species distribution in relation to site location within the estuary.

DAFF has been undertaking annual seagrass monitoring within the Port of Weipa since 2000. This monitoring is undertaken at three scales, with more intensive monitoring occurring near Port and shipping infrastructure:

- mapping of seagrass distribution and community type within the entire Port of Weipa limits, including Albatross Bay and the Embley, Hey, and Mission Rivers and Pine River Bay. This survey is helicopter-based and occurs approximately every three years with surveys so far undertaken in 2000–2002, 2005, 2008 and 2011 (DAFF and NQBP 2011);
- annual mapping of seagrass distribution and confirmation of species composition in a defined Intensive Monitoring Area, which focuses on meadows in the vicinity of the existing Port of Weipa and shipping infrastructure in the Embley and Hey Rivers; and,
- annual assessment of seagrass distribution, species composition and abundance in five core monitoring meadows primarily in the Embley River.

Marine Turtles

Marine Turtle Species Profiles

Table A2 provides a summary of marine turtle species covered in the Construction Marine and Shipping Management Plan.

Potential Marine Turtle Habitat

Figure A1 to **Figure A6** illustrates the potential habitat within the SoE Project area for the marine turtle species covered in the Construction Marine and Shipping Management Plan.

Table A2 – Profile Summaries for Marine Turtles

Species	Habitat Preferences			Preferred habitat in the Weipa/Cape York region	Likelihood of Occurrence
	Foraging	Nesting/Breeding	Migratory		
Green Turtle *(Chelonia mydas)* (Vulnerable)	Shallow coastal seagrass and seaweed, driftlines and *Sargassum* rafts. Suitable seagrass habitat was identified within the Project area.	Nests on sandy beaches. Remains close to the nesting site between nesting intervals. Mates near-shore in vicinity of the nesting ground. Nesting identified in the Project area.	Pelagic.	Coastal waters, in particular seagrass beds. The Wellesley Island area in the south-western corner of the Gulf of Carpentaria is a significant nesting site.	**Boyd Port Site** **Known to Occur**: This species is known to forage in shallow coastal areas, which would include the Boyd Port site footprint. The 2013 surveys recorded this species as nesting at very low densities in the vicinity of the Boyd Port site. **New Spoil Ground** **Possible**: This species prefers to forage in shallow coastal areas or within seagrass beds. The new spoil ground would be too deep (-25m LAT) to provide preferred foraging habitat for this species and it contains no seagrass beds. While the p new spoil ground does not represent preferred habitat, it is possible they are transient in the area. **Albatross Bay Spoil Ground** **Possible**: For the same reasons as the new spoil ground, it is unlikely that this species would frequently occur at the Albatross Bay spoil ground; however, it is possible that they transit the area. **Ferry/Barge Terminal Construction Areas – Hey and Embley Rivers** **Likely**: This species is known to forage within shallow coastal areas and seagrass beds. Foraging habitat for this species is present in the estuaries. **Balance of Project Area not disturbed** **Likely**: The species is likely to forage in the Project area. Surveys have found no nests in the Project area. No large rookeries are present in the region. **Construction Shipping Routes** **Likely**: This species is common, both feeding and nesting throughout the GBR and in tropical Australian waters including Torres Strait and the Arafura Sea.
Hawksbill Turtle *(Eretmochelys imbricata)* (Vulnerable)	Intertidal and subtidal rocky and coral reefs. Suitable foraging habitats were identified within the Project area.	Nests on sandy beaches. Mates near-shore or offshore from the nesting beach. Hawksbill nesting identified in the Project area.	Pelagic.	Hawksbill Turtle nesting sites occur on islands adjacent to Arnhem Land and north-eastern Cape York. The main feeding habitat for the species tends to be tidal and sub-tidal reefs. Hawksbill Turtles also commonly inhabit seagrass flats and mangrove habitats.	**Boyd Port Site** **Known to Occur**: Near shore fringing reef communities occur within the vicinity of the Boyd Port area at Boyd Point, Pera Head and between Pera Head and Thud Point. This species may therefore traverse across the Boyd Port site to access preferred feeding habitat. The 2013 surveys recorded this species as nesting at very low densities in the vicinity of the Boyd Port site. **New Spoil Ground** **Possible**: No seagrass beds or seabed features e.g. patch reefs were identified within the footprint of the new spoil ground. Drop camera surveys indicate that this area is largely unvegetated, however, Hawksbill Turtles may feed on sea cucumbers or jellyfish in this area. As Nine Mile Reef, which includes suitable foraging habitat for this species, is located approximately 6km south-south-west of the new spoil ground, this species may traverse the new spoil ground to access Nine Mine Reef for foraging. **Albatross Bay Spoil Ground** **Possible**: The Albatross Bay spoil ground does not contain or is not close to any reef communities. It is currently actively used for disposal of spoil dredged annually by NQBP. It is therefore unlikely this species would frequently occur in this area; however they may transit the site. **Ferry/Barge Terminal Construction Areas – Hey and Embley Rivers** **Possible**: The Hey and Embley Rivers contain seagrass and mangrove habitats which may be utilised by this species. **Balance of Project Area not disturbed** **Known to Occur**: Although difficulties in identifying nest activity of this species exist, low density nesting is recorded from a number of locations from False Pera Head to Boyd Bay. Reef habitat in the area is also likely to provide significant foraging habitat for the species and they are also likely to inhabit seagrass flats and mangrove habitats. **Construction Shipping Routes** **Likely:** This species is common, both feeding and nesting throughout the GBR and in tropical Australian waters including Torres Strait and the Arafura Sea.
Flatback Turtle *(Natator depressus)* (Vulnerable)	Soft-bottom, coastal waters and rocky reefs. Wide depth range. Suitable foraging habitat within the Project area.	Nests on sandy beaches in dunes or a steep seaward slope. Mates offshore from the nesting ground. Known to nest in the Torres Strait and NW Gulf of Carpentaria. Some nesting identified in the Project area.	Coastal waters and surface waters of the continental shelf.	Soft-bottom, coastal waters including but not limited to shallow water habitats. Nesting is confined to Australia.	**Boyd Port Site** **Known to Occur**: Nesting has been regularly recorded within and surrounding the Boyd Port site footprint and is best described as low density nesting. The area is not a major location for breeding aggregations of the species. This species forages in shallow coastal habitats. The footprint of the Boyd Port would be considered foraging habitat for this species. **New Spoil Ground** **Possible**: No seagrass beds or seabed features e.g. patch reefs were identified within the footprint of the new spoil ground. Drop camera surveys indicate that this area is largely unvegetated; however, Flatback Turtles may feed on sea cucumbers or jellyfish in this area. **Albatross Bay Spoil Ground** **Possible:** The Albatross Bay spoil ground does not contain or is not close to any reef communities. It is currently actively used for disposal of spoil dredged annually by NQBP. It is therefore unlikely this species would frequently occur in this area; however they may transit the site. **Ferry/Barge Terminal Construction Areas – Hey and Embley Rivers** **Likely**: The footprints of the ferry/barge terminal construction areas are within an estuarine environment which may be considered foraging habitat for this species. **Balance of Project Area not disturbed** **Known to Occur**: The Flatback Turtle is likely to forage in the Project area and nesting has been regularly recorded and is best described as low density nesting. The area is not a major location for breeding aggregations of the species. **Construction Shipping Routes** **Likely:** Nesting for this species is centred in the southern GBR and in western Torres Strait. The species is found foraging around Australia including through Torres Strait.
Loggerhead Turtle *(Caretta caretta)* (Endangered)	Intertidal and subtidal coral and rocky reefs, seagrass, unvegetated sand or mud.	Nests on open, sandy beaches in southern Queensland and Western Australia. Nesting not identified within the Project area.	Pelagic, but migrates from rookeries in coastal waters suitable for foraging.	Coastal waters including subtidal and intertidal coral and rocky reefs and seagrass meadows as well as soft-bottomed habitats.	**Boyd Port Site** **Likely:** The species is likely to be transient in the vicinity of the Boyd Port and use it for foraging or resting. **New Spoil Ground** **Likely:** This species is likely to occur within the new spoil ground for the same reasons that it is likely to occur in the vicinity of the Boyd Port. **Albatross Bay Spoil Ground**

Species	Habitat Preferences			Preferred habitat in the Weipa/Cape York region	Likelihood of Occurrence
	Foraging	Nesting/Breeding	Migratory		
	Suitable foraging habitat occurs within the Project area.				**Likely:** This species is likely to occur within the Albatross Bay spoil ground for the same reasons that it is likely to occur in the vicinity of the Boyd Port. **Ferry/Barge Terminal Construction Areas – Hey and Embley Rivers** **Likely:** This species is likely to occur in the vicinity of the ferry/barge terminal construction areas for the same reasons that it is likely to occur within the Boyd Port footprint. **Balance of Project Area not disturbed** **Likely:** The species is likely to be transient in the Project area and use it for foraging or resting. No rookeries are present in the Project area. **Construction Shipping Routes** **Likely**: This species is commonly observed within the GBR and is known to migrate through the Gulf of Carpentaria, Torres Strait, Arnhem Land and Papua New Guinea. Nesting occurs in the southern GBR.
Olive Ridley Turtle *(Lepidochelys olivacea)* (Endangered)	Benthic unvegetated coastal waters but also some pelagic foraging over a wide depth range. Suitable foraging habitat within the Project area.	Nest on sandy beaches. The beaches of the Project area assumed to support nesting based on previous records. Inshore habitat near nest beach during inter-nesting periods.	Hatchlings pelagic then juveniles return to coastal waters. Adults utilise coastal water and out to the continental shelf.	Coastal waters including but not limited to reefs. The species forages in benthic habitats over a range of depths from a few metres to hundreds of metres. Low density nesting has been historically recorded from a number of locations including the Gulf of Carpentaria.	**Boyd Port Site** **Known to Occur**: Sporadic nesting has been recorded surrounding the Boyd Port site footprint. This species forages in shallow unvegetated coastal habitats. The proposed footprint of the Port would therefore be considered foraging habitat for this species. **New Spoil Ground** **Possible**: Unvegetated sediments may provide foraging habitat for Olive Ridley Turtles, as this species has been known to forage within these depths. This species may also transit the site. **Albatross Bay Spoil Ground** **Possible**: Unvegetated sediments may provide foraging habitat for Olive Ridley Turtles, as this species has been known to forage within these depths. This species may also transit the site. **Ferry/Barge Terminal Construction Areas – Hey and Embley Rivers** **Likely**: This species forages in shallow unvegetated coastal habitats. The parts of the footprints of the ferry/barge terminal construction areas that are not vegetated may therefore provide foraging habitat for this species. **Balance of Project Area not disturbed** **Known to Occur**: Low density nesting has previously been recorded from a number of locations from False Pera Head to Boyd Bay, and nesting has also been recorded further north between Weipa and Bamaga. **Construction Shipping Routes** **Likely**: This species nests in the Northern Territory and the Gulf of Carpentaria. Although uncommon in the GBR, Olive Ridley Turtles are found around northern Australia.
Leatherback Turtle *(Dermochelys coriacea)* (Endangered)	Pelagic feeder in tropical, subtropical and temperate waters. Suitable foraging habitat occurs within the Project area, and Albatross Bay.	Nest on sandy beaches although only a very small proportion of the global population nest in Australia. Nesting not identified within the Project area. Mates offshore.	Pelagic.	Pelagic environment. The Albatross Bay area is identified as a potential foraging area for the species.	**Boyd Port Site** **Likely**: The species is likely to occur sporadically in the vicinity of the Boyd Port site, using it for foraging. **New Spoil Ground** **Likely**: The species is likely to occur sporadically in the vicinity of the new spoil ground, using it for foraging. **Albatross Bay Spoil Ground** **Likely**: The species is likely to occur sporadically in the vicinity of the Albatross Bay spoil ground, using it for foraging. **Ferry/Barge Terminal Construction Areas – Hey and Embley Rivers** **Unlikely**: This species prefers oceanic environments to estuarine environments, so it is unlikely to utilise the estuaries that contain the footprints of the ferry/barge terminal construction areas as habitat. **Balance of Project Area not disturbed** **Likely**: The species is likely to occur in the Project area, using it for foraging. Leatherback Turtles are rarely found in Queensland, however they have been reported on the Western Cape York peninsula coast (EHP pers. comm.). **Construction Shipping Routes** **Likely**: Although seen only in low densities in Australia, the species is known to occur in the GBR and nests in the Northern Territory and to the north of Australia, including in Papua New Guinea.

Figure A1: Potential Habitat of the Green Turtle

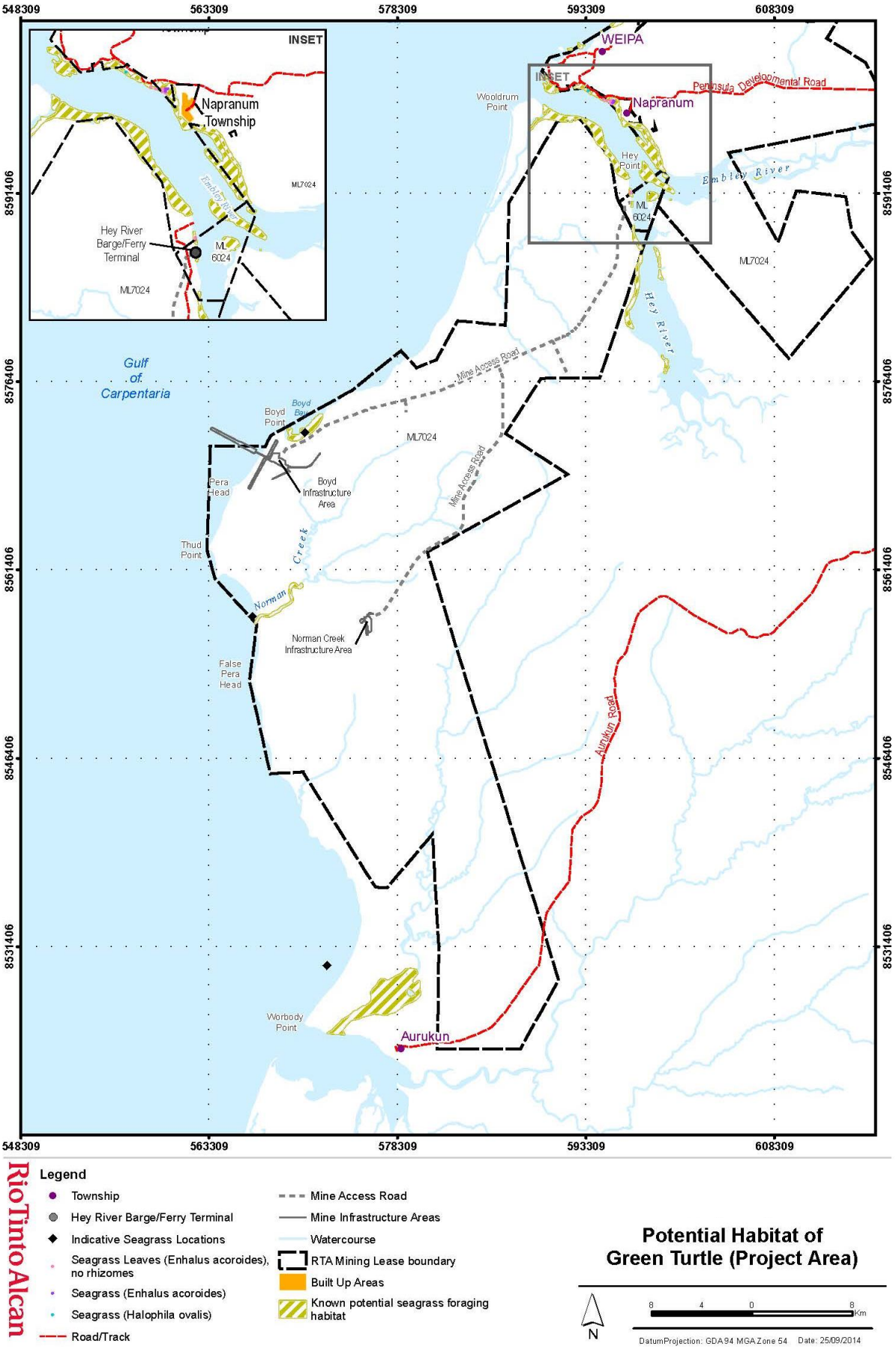


Figure A2: Potential Habitat of the Hawksbill Turtle

Figure A3: Potential Habitat of the Flatback Turtle

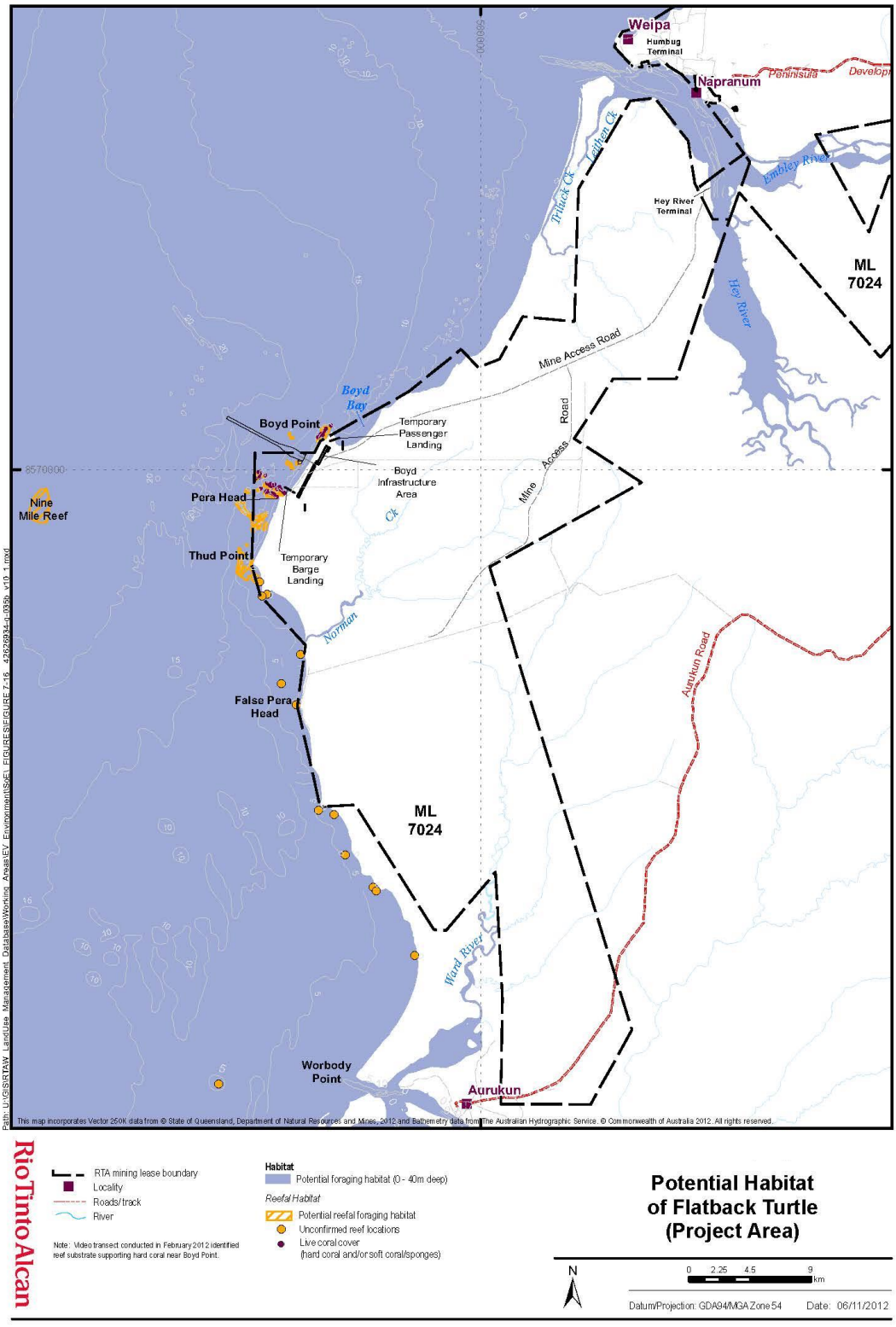


Figure A4: Potential Habitat of the Loggerhead Turtle

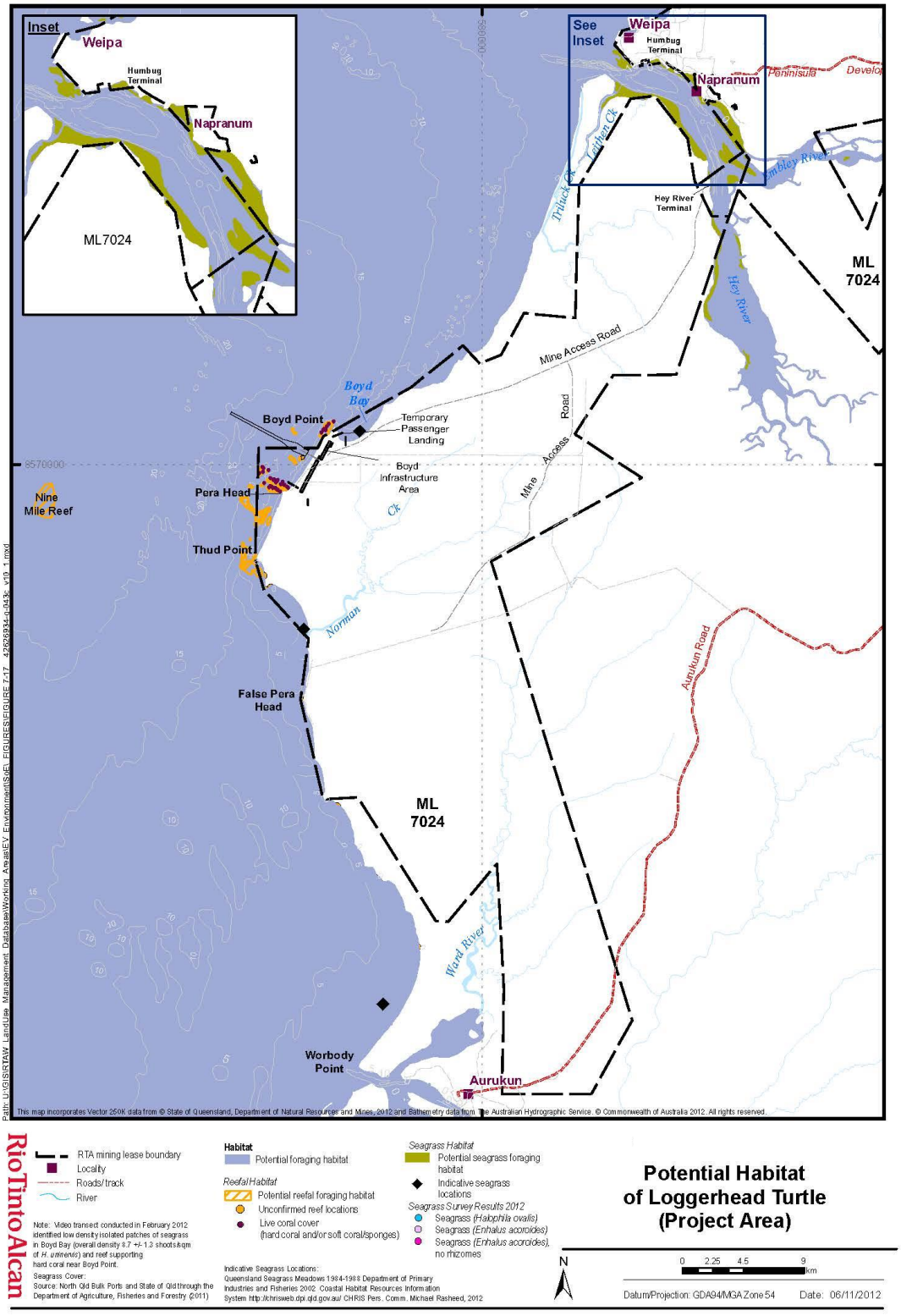


Figure A5: Potential Habitat of the Olive Ridley Turtle

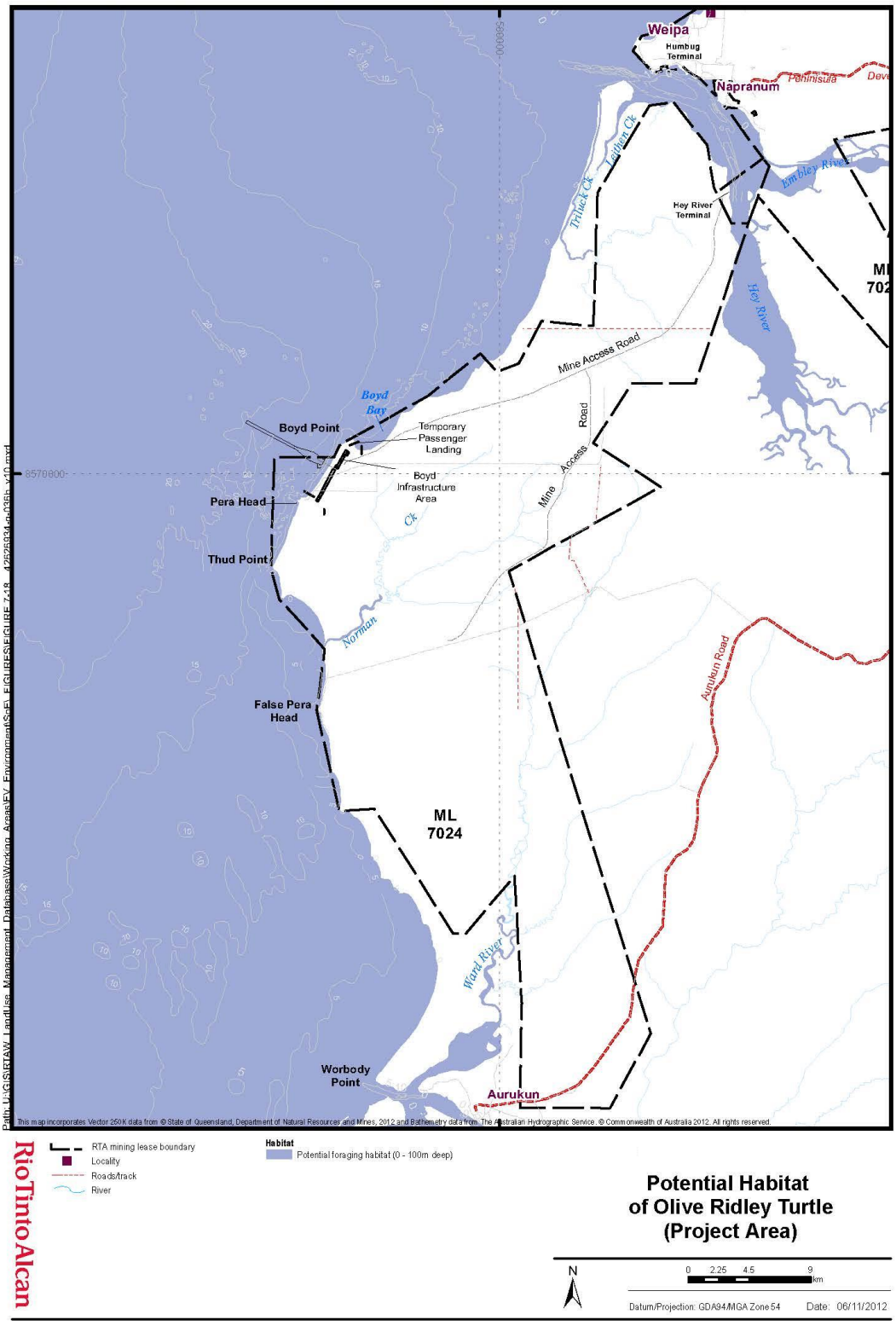
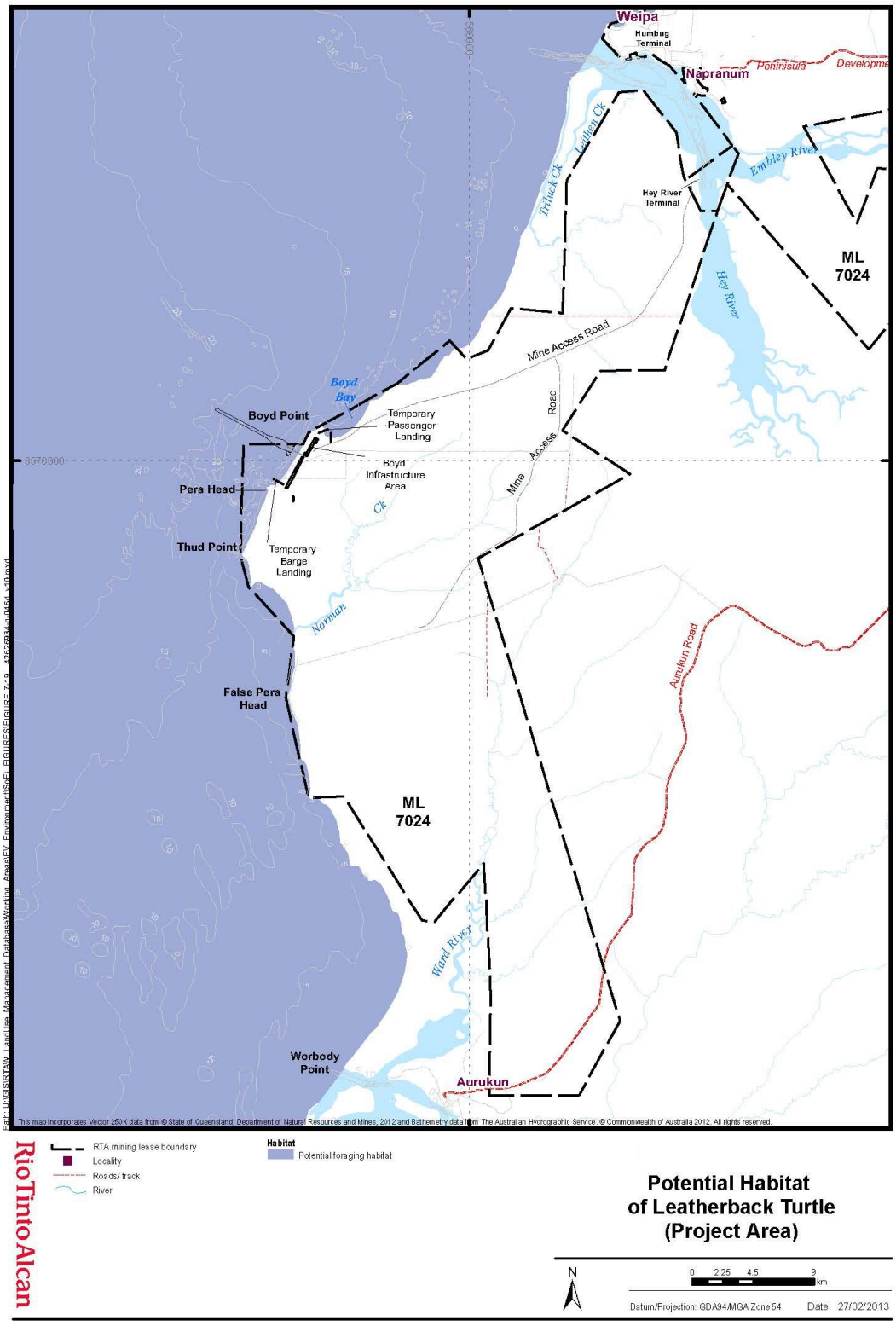


Figure A6: Potential Habitat of the Leatherback Turtle



Cetaceans

Cetacean Species Profiles

Table A3 provides a summary of cetacean species covered in the Construction Marine and Shipping Management Plan.

Potential Cetacean Habitat

Figure A7 and **Figure A8** illustrate the potential habitat within the SoE Project area for the dolphin species covered in the Construction Marine and Shipping Management Plan.

Table A3 – Profile Summaries for Listed Dolphin Species and Bryde's Whale

Species	Habitat Preferences			Known / estimated population	Likelihood of Occurrence
	Foraging	Breeding	Migratory		
Australian Snubfin Dolphin (*Orcaella heinsohni*) (Migratory)	Shallow waters (<20m depth), often associated with tidal riverine and estuarine systems, enclosed bays and coastal lagoons.	Unknown. No calving areas are known in Australian waters, but a near-term foetus and a neonate are recorded from Townsville.	Unknown. Potentially have a large home range from which they follow a model of emigration and immigration for particular habitat areas.	Regional population levels (e.g. Queensland) are likely to be in the order of thousands rather than tens of thousands. Likely to be endemic to Australian waters.	**Boyd Port Site** **Known to Occur**: Incidental sightings of this species were recorded in the vicinity of the Boyd Port footprint during field studies. **New Spoil Ground** **Possible**: No incidental sightings were recorded. This species usually inhabits shallow coastal waters less than 20m deep and are often associated with coastal and estuarine waters, enclosed bays and coastal lagoons. The new spoil ground is in deeper water than this and therefore it is unlikely to represent preferred habitat for this species. However, it is possible they may migrate through the area. **Albatross Bay Spoil Ground** **Possible**: No incidental sightings were recorded. The Albatross Bay spoil ground is primarily characterised as flat, unvegetated soft sediments habitat, and is therefore unlikely to support sufficient densities of prey species to be considered preferred habitat for this species. However, it is possible that this species may migrate through or opportunistically feed in the area. **Ferry/Barge Terminal Construction Areas – Hey and Embley Rivers** **Likely**: No incidental sightings were recorded in the Hey and Embley Rivers or during targeted surveys in 2012 and 2014. During the 2014 survey, a few individuals were recorded at the mouth of the Mission River. As this species are known to occur in estuarine and coastal habitats, it is likely that this species may occur in the ferry/barge terminal construction areas. **Balance of Project Area not disturbed** **Known to Occur**: Incidental sightings of this species were recorded in coastal waters during field studies. This species was recorded in coastal waters during the 2014 survey at the mouth of the Mission River and in the southern part of the Project area between Ina Creek and Aurukun. **Construction Shipping Routes** **Known to Occur**: Although the Australian Snubfin Dolphin has been recorded throughout coastal waters along the north Queensland coast, the species would generally occur inshore and in shallower waters rather than the majority of the construction shipping route.
Indo-Pacific Humpback Dolphin (*Sousa chinensis*) (Migratory)	Mangroves to sandy bottom estuaries and embankments to rock and/or coral reefs.	Unknown. No calving areas are known in Australian waters.	Unknown. There is some evidence of longshore movements of animals in Australian populations.	Unknown. Regional population levels (e.g. Queensland) are likely to be in the order of thousands rather than tens of thousands.	**Boyd Port Site** **Known to Occur:** Sightings of this species were recorded in the vicinity of the Boyd Port footprint during field studies. Targeted cetacean surveys in 2012 and 2014 confirmed the presence of Indo-Pacific Humpback Dolphins at Boyd Point. **New Spoil Ground** **Possible:** Cetacean surveys in December 2014 did not identify the presence of Indo-Pacific Humpback Dolphins within the New Spoil Ground, however they were identified inshore in the vicinity of this spoil ground. **Albatross Bay Spoil Ground** **Possible:** Cetacean surveys in December 2014 did not identify the presence of Indo-Pacific Humpback Dolphins within the Albatross Bay Spoil Ground, however they were identified inshore in the vicinity of this spoil ground. **Ferry/Barge Terminal Constriction Areas – Hey and Embley Rivers** **Known to Occur:** Cetacean surveys in December 2014 confirmed the presence of Indo-Pacific Humpback Dolphins within the Embley and Hey River estuary. **Balance of Project Area not disturbed** **Known to Occur**: The December 2014 survey identified the species within all coastal waters surveyed adjacent to the Project area.. **Construction Shipping Routes** **Known to Occur:** The December 2014 survey identified the species would be likely to occur around the Port of Weipa and SoE Project site. The likelihood of occurrence would decrease in deeper was as the Indo -Pacific Dolphin would generally occur inshore and in shallower waters rather than the majority of the construction shipping route.
Bryde's Whale (*Balaenoptera edeni*) (Migratory)	Inshore form moves along the coast inside the 200m depth contour in response to prey availability. Offshore form is found in waters 500-1,000m deep.	Limited data suggest breeding and calving in lower latitudes.	No evidence of large-scale movements of inshore form. Offshore form may migrate to warmer tropical waters during winter.	Unknown. Inshore stocks likely to be small, and total Australian population estimated at less than 10,000 mature animals.	**Boyd Port Site** **Possible**: While the Boyd Port site does not contain preferred habitat, the recording of the species from tropical inshore waters suggests it is possible that the species may occur sporadically in the vicinity of the Boyd Port footprint. **New Spoil Ground** **Possible**: This species may possibly occur within the new spoil ground footprint for the same reasons that it possibly occurs in the vicinity of the Boyd Port site. **Albatross Bay Spoil Ground** **Possible**: This species may possibly occur within the Albatross Bay spoil ground footprint for the same reasons that it possibly occurs in the vicinity of the Boyd Port site. **Ferry/Barge Terminal Construction Areas – Hey and Embley Rivers** **Unlikely**: Although this species occurs in shallow water, it generally is found in coastal areas rather than estuaries. It is therefore unlikely to occur within the barge/ferry terminal construction footprints in the Embley and Hey Rivers. **Balance of Project Area not disturbed** **Possible**: While the Project area does not contain preferred habitat, it is possible that the species may occur sporadically in the Project area. **Construction Shipping Routes** **Possible**: Although there have been very limited confirmed sightings of the Bryde's Whale in Australia, the majority of the construction shipping route is within suitable pelagic habitat and the known geographic range for this species.

Figure A7: Potential Habitat of the Australian Snubfin Dolphin (Project Area)

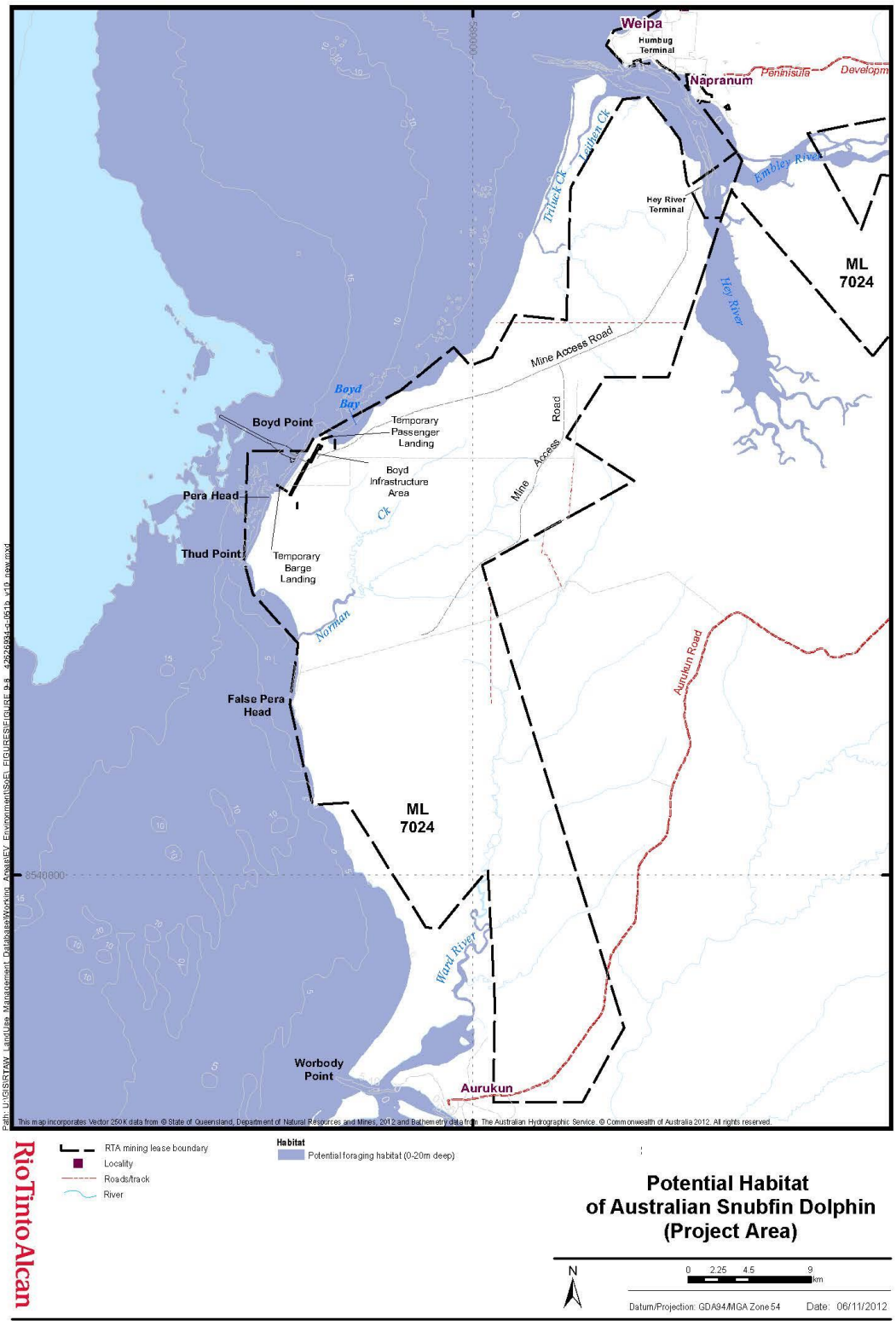
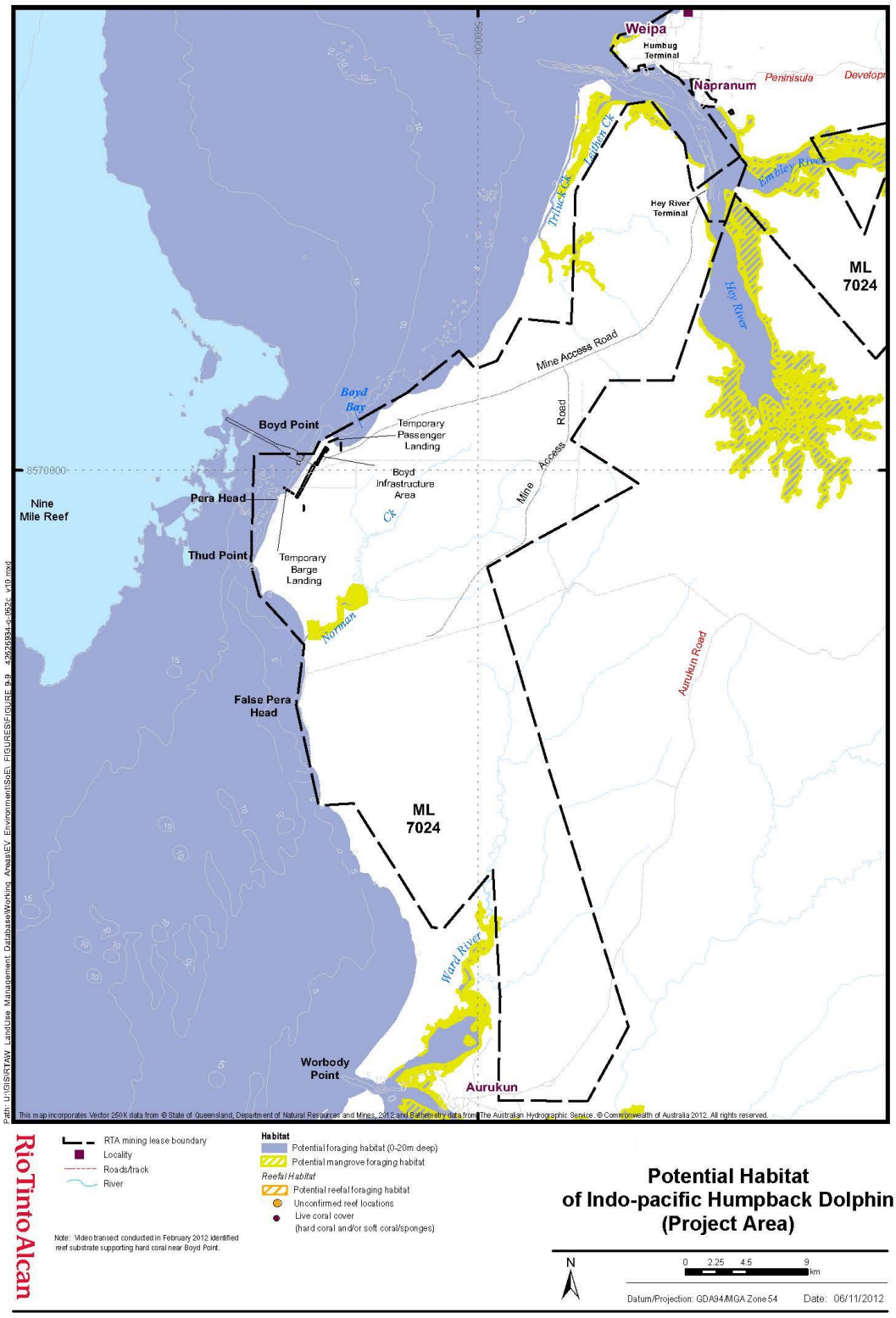


Figure A8: Potential Habitat of the Indo-Pacific Humpback Dolphin



Dugong Profile

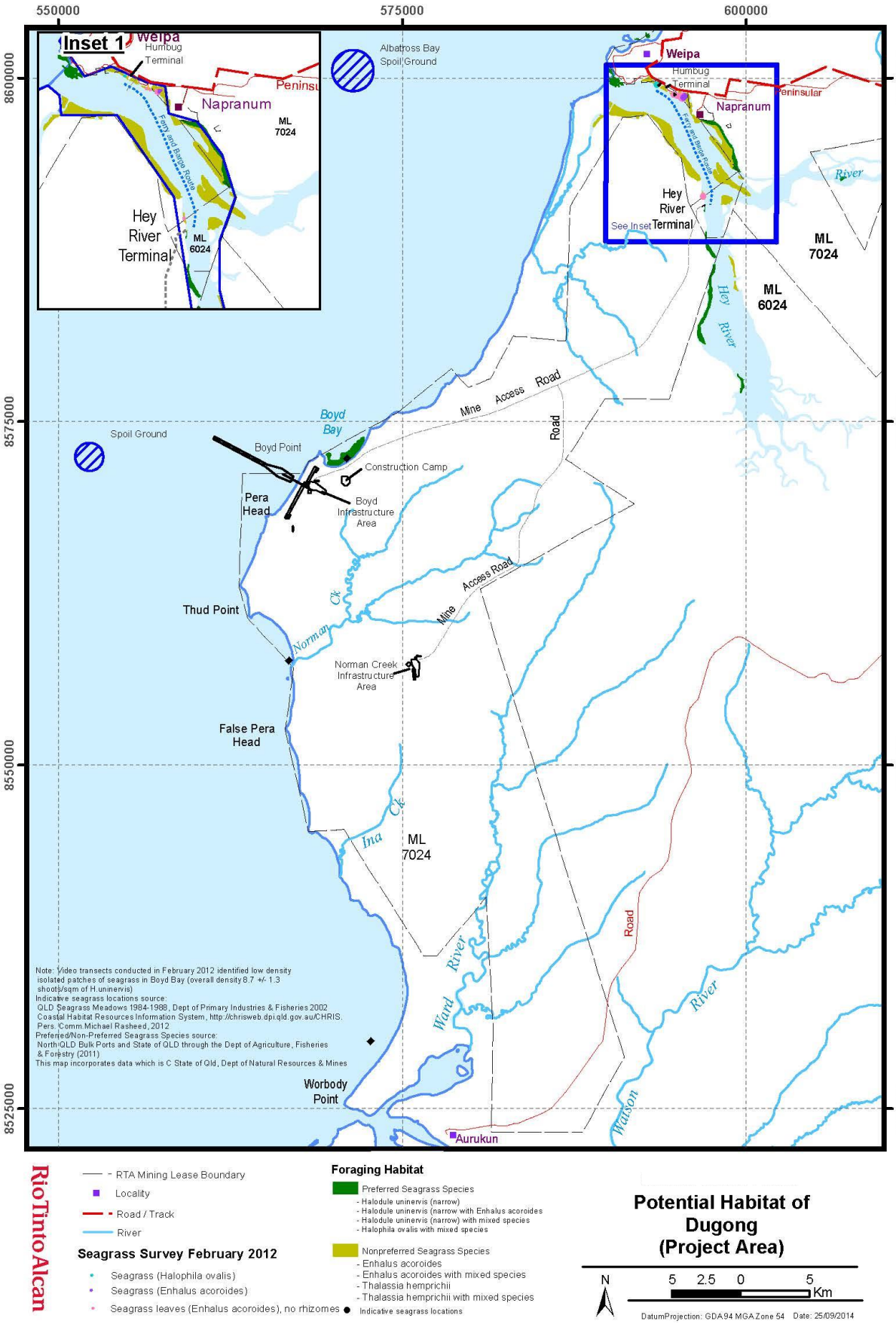
Table A4 provides a profile summary for Dugongs.

Figure A9 illustrates the potential habitat in the vicinity of the SoE Project for dugongs.

Table A4 – Profile Summary for Dugongs

Species	Habitat Preferences			Known/estimated population	Likelihood of Occurrence
	Foraging	Breeding	Migratory		
Dugong (*Dugong dugon*) (Migratory)	Seagrass beds typically dominated by *Halophila* and *Halodule* species. Seagrass beds that typically occur in shallow protected bays, shallow mangrove channels and the lee side of inshore islands.	Shallow waters, such as on tidal sandbanks and estuaries.	Generally do not appear to make systematic (seasonal) large scale migrations; but may move over large distances. Movement has been tracked up to approximately 600km and is thought to be associated with food availability.	Queensland coast of the Gulf of Carpentaria estimated population 7,000. The population of Dugong within the greater Gulf of Carpentaria area is considered one of the most important in Australia and the world.	**Boyd Port Site** **Known to Occur**: Traditional Owners report that the species migrates through Boyd Bay which also indicates migration past the Boyd Port site. **New Spoil Ground** **Possible**: May migrate through this area between foraging grounds, although this site does not contain suitable foraging habitat. **Albatross Bay Spoil Ground** **Possible**: May possibly migrate through the area of the Albatross Bay spoil ground, although this site does not contain suitable foraging habitat. **Ferry/Barge Terminal Construction Areas – Hey and Embley Rivers** **Known to Occur**: Known to occur in the area, associated with seagrass beds. The seagrass beds in the Embley and Hey Rivers may potentially constitute foraging habitat for Dugong. **Balance of Project Area not disturbed** **Known to Occur**: Known to occur in the Project area. Traditional owners report that the species migrates through Boyd Bay. The species is highly mobile and would traverse coastal waters between seagrass beds. **Construction Shipping Routes** **Likely**: Dugong may swim considerable distances offshore and so may potentially transit areas along the shipping routes. The likelihood of presence along the construction shipping route is greatest in shallower areas of the Torres Strait.

Figure A9: Potential Habitat for Dugongs



Appendix B Summary of Regulation Framework

TABLE B1: Summary of the Maritime Safety Regime Applicable to SoE Construction Shipping

(Note: not exhaustive - only the main instruments of most relevance to SoE construction shipping are listed)

IMO Instrument	**Major Provisions**	**Implementing AUS Instruments** (note: AMSA Marine Orders have regulatory status)	**Implementing QLD Instruments**
STCW Convention • *International Convention on Standards of Training, Certification & Watchkeeping for Seafarers.* • *STCW Code:*	• In force. Applies to ALL seagoing vessels except warships, fishing vessels, pleasure yachts and small craft. • Sets global standards for: ○ training, competence and certification of seafarers (all crew); and ○ systems and procedures to be followed for watchkeeping and for security. • Gives countries powers to take Port State Control actions against ships in their ports that are found to not comply (AMSA in Australia).	• Navigation Act & Regs. • Marine Safety (Domestic Commercial Vessel) National Law Act & Regs.	• Transport Operations (Marine Safety) Act & Reg (with State-specific provisions). • Some provisions assumed by the AUS Marine Safety (Domestic Commercial Vessel) National Law Act & Regs.
COLREG Convention • *Convention on the International Regulations for Preventing Collisions at Sea:*	• In force. Applies to ALL seagoing vessels. • Sets the international "rules of the road" in order to prevent collisions between vessels, including rules for, *inter alia*: ○ Steering and sailing. ○ Lookouts. ○ Safe speeds. ○ Narrow channels. ○ Traffic separation schemes and routing measures. ○ Overtaking, head-on, crossing and right of way. ○ Restricted visibility situations. ○ Lights and shapes to be shown by vessels. ○ Signals by sound and lights.	• Navigation Act & Regs.	• Transport Operations (Marine Safety) Act & Reg.
SOLAS Convention • *International Convention for the Safety of Life at Sea:*	• In force. Generally regarded as the most important of all international Conventions concerning the safety of ships. • Generally applies to all ships engaged on international voyages (although Flag States may elect to also apply to ships on domestic voyages). • Different chapters and provisions apply to different classes (types and sizes) of ships. • Specifies minimum standards for the design, construction, equipment and operation of ships, including, *inter alia:* ○ Stability, machinery and electrical installations. ○ Fire protection, detection and extinction. ○ Live saving appliances & arrangements. ○ Radio communications. ○ Safety of navigation services to be provided by States (meteorological services, vessel traffic services, and search & rescue capability). ○ Mandatory Voyage Data Recorders (VDR) and Automatic Identification Systems (AIS) on ships. ○ Safe carriage of cargoes. ○ Carriage of dangerous goods under IMDG Code.	• Navigation Act & Regs.	• Transport Operations (Marine Safety) Act & Reg. (with State-specific provisions).

IMO Instrument	**Major Provisions**	**Implementing AUS Instruments** (note: AMSA Marine Orders have regulatory status)	**Implementing QLD Instruments**
	○ Mandatory shipboard safety system under ISM Code. ○ Mandatory shipboard security system under ISPS Code. ○ Additional safety measures for bulk carriers and special measures for Polar shipping.		
Selected Codes under SOLAS:			
ISM Code • *International Safety Management Code:*	• In force. Provides an international standard for the safe management and operation of ships to ensure safety at sea and avoidance of damage to the marine environment and to property. • Requires all shipping companies to have and to implement: ○ A safety and environmental protection policy. ○ A Designated Person Ashore (DPA) to ensure implementation. • Requires all ships to have and to implement: ○ An ISM Manual, which includes procedures for safe shipboard operations, maintenance of ship and equipment, emergency preparedness & response and reporting and correcting non-conformities and incidents. ○ Training of crew in ISM procedures. ○ A Document of Compliance (ISM Certificate). ○ Regular checks and audits.	• Navigation Act. • Marine Safety (Domestic Commercial Vessel) National Law Act & Regs. • AMSA Marine Order 58 - ISM Code.	• Transport Operations (Marine Safety) Act & Reg. • Safety Management System (SMS) required for commercial vessels >8 m operating in Qld waters, other than a ship operating in smooth waters that does not make voyages of more than 15 minutes duration.
IMDG Code • *International Maritime Dangerous Goods Code:*	• In force. Implements provisions of both SOLAS and MARPOL Annex III relating to the carriage of dangerous goods on ships. • Sets international standards on terminology, packaging, labelling, markings, stowage, segregation, handling & emergencies.	• Navigation Act. • AMSA Marine Order 41 - Dangerous Goods.	• Transport Operations (Marine Pollution) Act & Reg.
ISPS Code • *International Ships & Port Facility Security Code:*	• In force. Applies to all passenger ships on international voyages and all other ships >500GT on international voyages, and to any port facility that serves ships on international voyages. • Requires ship owners to have a company security officer: • Requires ships to have: ○ Ship security officer. ○ Ship security assessment & ship security plan ○ Ship Security Certificate ○ Daily designation of security Level. ○ Manned gangway when alongside in port, and mandatory sign-on and off of all persons joining and leaving ship, with certified security ID. • Requires port facilities to have: ○ Port facility security officer. ○ Port facility security assessment & port facility security plan. ○ Daily designation of security Level. ○ Security fencing and signage. ○ Manned gateways and mandatory sign-in and out of all persons entering port facility with certified security ID.	• Maritime Transport & Offshore Facilities Security Act & Regs.	• AUS legislation applies.

TABLE B2: Summary of the Marine Environment Protection Regime Applicable to SoE Construction Shipping
(Note: not exhaustive - only the main instruments of most relevance to SoE construction shipping are listed)

IMO Instrument	Major Provisions	Implementing AUS Instruments	Implementing QLD Instruments
Prevention of pollution, discharges & emissions from ships:			
MARPOL Convention • *International Convention for the Prevention of Pollution from Ships:*	• Refer Annexes I to VI below.	• Navigation Act. • Protection of the Sea (Prevention of Pollution from Ships) Act. • Protection of the Sea (Prevention of Pollution form Ships) (Orders) Reg.	• Transport Operations (Marine Pollution) Act & Reg.
• *MARPOL Annex I - Oil:*	• In force. Applies to all vessels except as otherwise specified. • Discharge of oil, oily mixtures and oil residues is PROHIBITED from ALL vessels, except for vessels ≥ 400GT if the vessel is underway and the discharge is <15ppm oil content and certain other provisions (additional for oil tankers ≥ 150GT), • All vessels ≥ 400GT must have (additional for oil tankers ≥ 150GT - see below), *inter alia:* ○ Notices that clearly display oil discharge prohibitions to crew. ○ Waste oil tanks. ○ IMO approved oil filtering equipment (oily-water separators) and oil discharge monitoring & control systems. ○ Standard oil discharge connection (for pumping waste oil ashore in port). ○ Oil Record Book Part I (Machinery Space Operations). ○ Shipboard Oil Pollution Emergency Plan (SOPEP). ○ Survey & certification for compliance at specified intervals. ○ Valid International Oil Pollution Prevention Certificate, certifying compliance. • All oil tankers ≥ 150GT must have, in addition to above, *inter alia:* ○ Oil Record Book Part II (Cargo or Ballast Operations). ○ Slops tanks. ○ Segregated ballast tanks. ○ Double hulls/ double bottoms & pump room bottom protection. ○ Specified limitations on size and arrangements of oil	• As per MARPOL overall plus: • AMSA Marine Order 91 (Marine Pollution Prevention - Oil).	• Transport Operations (Marine Pollution) Act & Reg. Requirements outlined in Pollution Prevention – documents required for ships (TMR 2010 or current version) • SOPEP required by: (a)All ships more than 35 m in length overall (b)Ships more than 24 m in length overall if Carrying oil as cargo or if there is a vehicle on-board carrying more than 400L of oil as cargo • Oil record book to be kept by (a) a ship that is an oil tanker of 150gt or more; (b) a ship, other than an oil tanker, of 150gt or more that carries oil in a portable tank with a capacity of 400L or more; (c) a ship, other than an oil tanker, of 400gt or more.

IMO Instrument	Major Provisions	Implementing AUS Instruments	Implementing QLD Instruments
	cargo tanks. ○ Minimum design standards for intact and damaged stability and oil pumping, piping and discharge arrangements. • All ships with aggregate fuel capacity of ≥ 600m3 must have specified fuel tank protection. • Ports must provide adequate reception facilities for waste oil from ships where required.		
• *MARPOL Annex 2 - Noxious Liquid Substances (chemicals):*	• In force. Applies to all vessels except as otherwise specified. • Discharge of residues of noxious liquid substances and the discharge of ballast water, tank washings or other mixtures containing such substances is prohibited unless in accordance with specified strict conditions. • All vessels carrying noxious liquid substances in bulk must have, *inter alia:* ○ Specified construction and pollution prevention equipment ○ Procedures and Arrangements Manual and Cargo Record. ○ Shipboard Marine Pollution Emergency Plan (SMPEP). ○ Survey & certification for compliance at specified intervals. ○ Valid International Prevention Certificate for the Carriage of Noxious Liquid Substances in Bulk, certifying compliance. • Ports must provide adequate reception facilities for noxious liquid substances where required.	• As per MARPOL overall plus: • AMSA Marine Order 93 (Marine Pollution Prevention - Noxious Liquid Substances)	• Transport Operations (Marine Pollution) Act & Reg. Requirements outlined in Pollution Prevention – documents required for ships (TMR 2010 or current version)
• *Annex 3 - Harmful Substances in Packaged Form (dangerous goods - see also IMDG Code):*	• In force. Applies to ANY ship carrying harmful substances in packaged form. • The discharge of harmful substances, including discharge of a package carrying harmful substances and leakage of harmful substances from packages, is PROHIBITED. • Specifies requirements for the packing, marking, labelling and stowing of packages carrying harmful substances (see also IMDG Code). • Requires a Harmful Substances Manifest and Stowage Plan to be carried by the ship, kept at shore office and submitted to authorities 48 hrs prior to departure.	• As per MARPOL overall plus: • AMSA Marine Order 94 (Marine Pollution Prevention - Harmful Substances in Packaged Form).	• Transport Operations (Marine Pollution) Act & Reg. Requirements outlined in Pollution Prevention – documents required for ships (TMR 2010 or current version)
• *MARPOL Annex IV - Sewage:*	• In force. Applies to all vessels ≥ 400GT and all vessels < 400GT if certified to carry ≥ 15 persons. • PROHOBITS ALL discharges of sewage except when: ○ ship has approved, IMO-compliant sewage treatment plant and discharge does not contain solids or cause discoloration of the receiving waters;	• As per MARPOL overall plus: • AMSA Marine Order 96 (Marine Pollution Prevention - Sewage).	• Transport Operations (Marine Pollution) Act & Reg. Requirements outlined in Pollution Prevention – documents required for ships (TMR 2010 or current

IMO Instrument	Major Provisions	Implementing AUS Instruments	Implementing QLD Instruments
	or ○ ship is >3nm from l nearest and sewage has been comminuted and disinfected using approved, IMO complaint system; or ○ ship is >12 nm from nearest land and any sewage that has been stored in a holding tank is not discharged instantaneously, but at a moderate rate. • Ports must provide adequate reception facilities sewage for ships where required.		version) • State-specific provisions applying to smaller vessels, requiring holding tanks on certain vessels & designating restricted areas). • For ships with 16 or more persons onboard, no discharge of untreated sewage is permitted in Queensland coastal waters (3nm).
• *MARPOL Annex V - Garbage:*	• In force. Applies to ALL vessels. • "Garbage" includes ALL forms of PLASTIC, food wastes, domestic wastes from ship's crew, operational wastes, cans, tins, bottles, rags, paper, cardboard, timber, cargo residues, cooking oils, fishing gear and animal carcasses. • PROHOBITS ALL discharges of ALL garbage except: ○ Food wastes ground to 25mm when the vessel is >3nm from nearest land. ○ Food wastes when the vessel is >12nm from nearest land. ○ Cargo residues that do not contain substances that are harmful to the marine environment and when the vessel >12nm from nearest land. ○ Animal carcasses when the vessel is as far as possible from nearest land. ○ (stricter conditions within Special Areas) • All vessels must have Notices that clearly display garbage discharge prohibitions to crew & passengers. • All vessels ≥ 400GT and all vessels < 400GT if certified to carry ≥ 15 persons must have Garbage Management Plan, and any such vessels engaged in international voyages must also have a Garbage Record book.	• As per MARPOL overall plus: • AMSA Marine Order 95 (Marine Pollution Prevention - Garbage).	• Transport Operations (Marine Pollution) Act & Reg. Requirements outlined in Pollution Prevention – documents required for ships (TMR 2010 or current version)
• *MARPOL Annex VI - Air Emissions:*	• In force. Applies to all vessels ≥ 400GT. • Limits the main air pollutants contained in ships' exhaust gas, including sulphur oxides and nitrous oxides. • Prohibits emissions of ozone depleting substances. • Regulates shipboard incineration and the emissions of volatile organic compounds from tankers. • Declares Emission Control Areas with stricter controls. • Seeks to reduce Greenhouse Gas emissions from ships through mandatory Energy Efficiency Design Index (EEDI) for new ships and the Ship Energy Efficiency Plan (SEEMP) for all ships.	• As per MARPOL overall plus: • AMSA Marine Order 97 (Marine Pollution Prevention - Air Pollution).	• None.

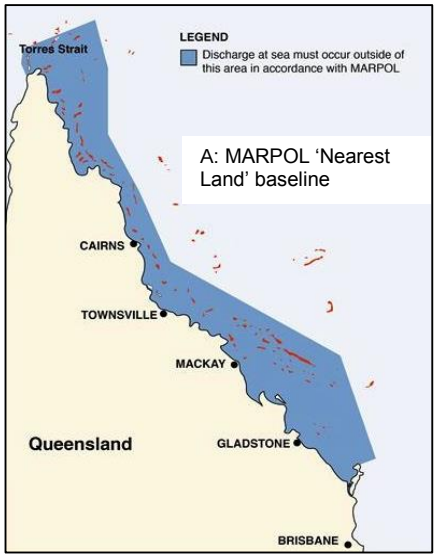
IMO Instrument	Major Provisions	Implementing AUS Instruments	Implementing QLD Instruments
AFS Convention • *International Convention on the Control of Harmful Anti-fouling Systems on Ships:*	• In force. Applies to ALL vessels & marine plant. • PROHOBITS the use of anti-fouling systems containing harmful substances listed in Annex 1 of the Convention • (currently only lists Organotin Compounds but others may be added over time). • Requires ships ≥ 400GT engaged in international voyages to be surveyed and certified for compliance (AFS Certificate). • Requires vessels <400GT but ≥ 24 m engaged in international voyages to be certified for compliance (AFS Declaration).	• Protection of the Sea (Harmful Anti-fouling Systems) Act.	• None.
Underwater Noise Guidelines • *Guidelines on reduction of underwater noise from commercial shipping to address adverse impacts on marine life (MEPC.1/Circ.833):*	• Guidelines. Countries can legislate to make mandatory. • Applies to all commercial ships. • Recommends use of computational models for both new and existing ships to understand what noise reductions might be achievable for certain changes in design or operational behaviour. • Recommends standards and references to measure underwater noise against: o (ISO/PAS) 17208-1 - Acoustics - Quantities and procedures for description and measurement of underwater sound from ships – Part 1: General requirements for measurements in deep water. o American National Standards Institute and the Acoustical Society of America (ANSI/ASA) S12.64-2009 "Quantities and Procedures for Description and Measurement of Underwater Sound from Ships, Part 1: General Requirements". o ISO/DIS 16554 - Ship and marine technology - Measurement and reporting of underwater sound radiated from merchant ships - deep-water measurement. o Recommends: o Design considerations for new ships - including coordinated hull and propeller design. o Propeller designs that reduce cavitation. o Vibration control measures for on-board machinery.	• Not currently legislated in but provides the best practice for this issue in AUS.	• None.

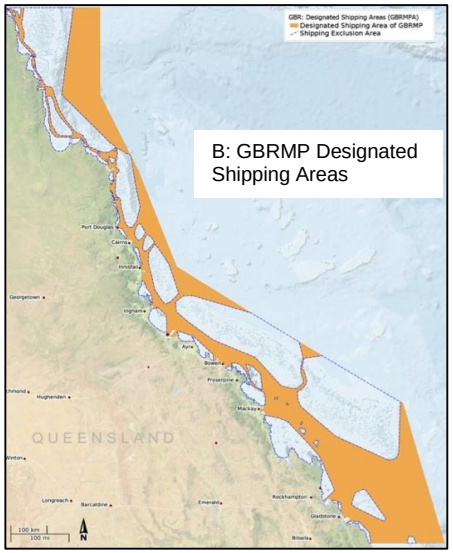
IMO Instrument	Major Provisions	Implementing AUS Instruments	Implementing QLD Instruments
	○ Regular hull and propeller cleaning. ○ Speed restrictions where relevant. ○ Vessel routing to avoid aggregations of sound-sensitive marine life.		
Ships' waste reception facilities in ports:			
MARPOL Annexes I, II, IV and V as above plus:			
• *Guide to Best Practice for Port Reception Facility Providers and Users (MEPC.1/Circ.671/Rev.1):*	• Provides useful, IMO-standardised guidance on how to provide and use ships' waste reception facilities in ports.	• As per MARPOL. • AMSA Marine Notice 14/2013 advises shipping & ports of these Guidelines.	• As per MARPOL.
• *Guidance for Ensuring the Adequacy of Port Waste Reception Facilities (IMO Publication 598E):*	• Provides useful, IMO-standardised guidance on how to ensure the "adequacy" of ships' waste reception facilities in ports, in relation to demand for such facilities.	• As per MARPOL.	• As per MARPOL.
• *Comprehensive Manual on Port Reception Facilities (IMO Publication 597E):*	• Provides useful, IMO-standardised guidance on how to provide and use ships' waste reception facilities in ports.	• As per MARPOL.	• As per MARPOL.
Marine pest transfers by ships:			
BWM Convention • *International Convention for the Control and Management of Ships' Ballast Water and Sediments (+14 supporting Guidelines):*	• Not yet in force - anticipated to enter into force 2015. • Applies to all vessels which carry and discharge ballast water on international voyages. Countries can choose to apply to domestic voyages. • Requires ships to undertake Ballast Water Management in accordance with prescribed standards, with Ballast Water Exchange at Sea as an interim measure, at prescribed distances from the coast, replaced by on-board or port-side treatment systems, with phase in periods depending on ship build date and ballast capacity. • Requires ships to have: ○ Approved Ballast Water Management Plans and Record Books. ○ Survey & certification for compliance at specified intervals. ○ Valid International Ballast Water Management Certificate, certifying compliance. • Requires ships to remove and dispose of sediments from ballast tanks in accordance with the Ballast Water Management Plan	• AUS legislation has been prepared but not yet passed - anticipated as soon as Convention enters into force. • AUS was a driving country in the development of the Convention at IMO and did adopt it at IMO so it does provide the best practice for this issue in AUS. • The *Quarantine Act* requires international ships to undertake Ballast Water Exchange at Sea.	• None
Biofouling Guidelines • *Guidelines on control and management of ships' biofouling to minimize the transfer of invasive aquatic species*	• Guidelines. Countries can legislate to make mandatory. • Applies to all vessels. • Recommends that:	• Not currently legislated in AUS however AUS they do provide the best practice for this issue in AUS. • AMSA Marine Notice 19/2013 advises	• None

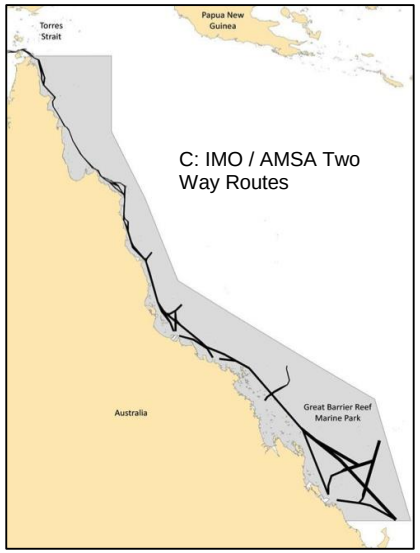
IMO Instrument	Major Provisions	Implementing AUS Instruments	Implementing QLD Instruments
(MEPC 62/24/Add.1 Annex 26):	○ Vessels should have a Biofouling Management Plan and Record Book. ○ Vessels should have an effective and well-maintained anti-fouling system on all wet surfaces. ○ Vessels should have regular dry-docking and hull cleaning, with attention to high-risk areas. ○ In-water inspection and cleaning can be useful, with cautions that in-water cleaning to be subject to national/local controls reflecting concerns in-water cleaning can cause marine pest introductions, as well as anti-fouling pollution. ○ Vessel crews should be educated and trained in biofouling risks and management. • Identifies design improvements for vessels to minimize biofouling.	shipping of these Guidelines. • In-water cleaning restricted in Australia • AUS has also published the following guidance of direct relevance to SoE construction shipping: ○ Australian National Biofouling Management Guidance for Commercial Vessels. ○ Australian National Biofouling Management Guidance for Non-trading Vessels	
Strikes by ships on cetaceans:			
Ship Strikes Guidelines • *Guidance document for minimizing the risk of ship strikes with cetaceans (MEPC.1/Circ.674):*	• Guidelines. Countries can legislate to make mandatory. • Applies to all commercial ships. • Recommends possible actions to be taken at national level, including: ○ Governments seeking to reduce ship strikes of cetaceans in their waters should first clearly define the problem in the target area, including identifying what specific species are at risk: what physical characteristics, distribution, and behaviour make them susceptible to ship strikes; seasonality of presence, and vessel traffic characteristics that contribute risk. ○ Maritime safety is of paramount concern. ○ Education and outreach (including for vessel crews to make them aware). ○ Routing and reporting measures. ○ Speed restrictions. ○ Watches and lookouts.	• Not currently legislated in AUS but provide the best practice for this issue in AUS. • AMSA Marine Notice 12/2011 advises shipping of these Guidelines. • References EP(BC) Act and protection of cetaceans under this Act, and need for ships to report all cetacean strikes in accordance with the EP(BC) Act.	• None
Preparedness & response to oil and chemical spills:			
OPRC Convention • *International Convention on Oil Pollution Preparedness, Response & Cooperation:*	• In force. Applies to nations, ports and terminals. • Lays out the procedures for countries to cooperate and assist each other in oil pollution preparedness and response. • At national level: ○ Requires countries to have national oil spill response plans. ○ Requires ports and terminals to have site-specific oil spill response plans.	• Not legislatively mandated in AUS. • However National administrative arrangements between AMSA and the States under NATPLAN require port operators to maintain first strike oil spill response capability at their ports. • AMSA (2103) Technical Guidelines for the Preparation of Marine Pollution Contingency Plans for Marine & Coastal Facilities. • Additionally, the Protection of the Sea	• Transport Operations (Marine Pollution) Act. • Queensland Coastal Contingency Plan (QCCP)

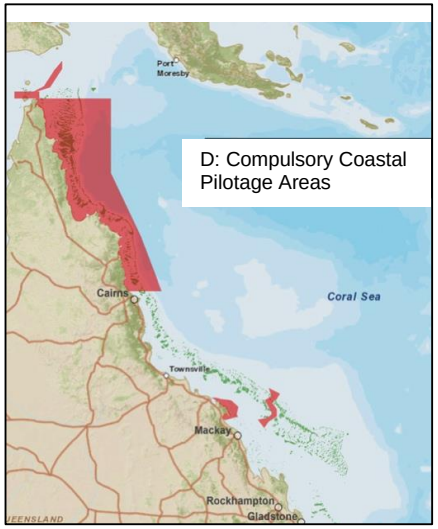
IMO Instrument	Major Provisions	Implementing AUS Instruments	Implementing QLD Instruments
		(Shipping Levy) Act and Protection of the Sea (Shipping Levy Collection) Act require ships entering AUS ports to pay GT-based levy, in order to fund the NATPLAN arrangements. • May apply to relevant SoE construction ships arriving at Weipa and Project site.	
OPRC-HNS Protocol • *Protocol on Preparedness, Response & Cooperation to Pollution Incidents by Hazardous and Noxious Substances:*	• In force. As per OPRC applied to chemical spills.	• As above applied to chemical spills as well.	• As above applied to chemical spills as well
SOPEP Guidelines • *Guidelines on the development of shipboard oil pollution emergency plans (MEPC/54(32)):*	• Provides guidelines and template for SOPEPs.	• Protection of the Sea (Prevention of Pollution form Ships) Act & Reg. • AMSA Marine Order 91 (Marine Pollution Prevention - Oil).	• Transport Operations (Marine Pollution) Act & Reg. • MSQ, 2015. Guide for the prevention of ship sourced pollution and for the safe transfer of bunkers in Queensland waters. •
Liability & compensation for oil & chemical spills:			
CLC Convention • *International Convention on Civil Liability for Oil Pollution Damage:*	• In force. Applies to all oil tankers irrespective of size - except as specified below. • Makes owner liable for the costs of damages caused by any oil pollution from the tanker, up to a prescribed limit based on tonnage. • Requires owner of tankers that carry >2,000 tons of oil in bulk as cargo to have mandatory insurance or financial security to cover the liability. • Requires tankers that carry >2,000 tons of oil in bulk as cargo to have International Oil Pollution Certificate certifying that insurance is in place. • Provides procedure for victims to claim compensation.	• Protection of the Sea (Civil Liability) Act & Regs.	• None
Bunkers Convention • *International Convention on Civil Liability for Bunker Oil Pollution Damage:*	• In force. Applies to all ships irrespective of size - except as specified below - including bunker fuel (non-cargo) spills from oil tankers. • Makes owner liable for the costs of damages caused by any oil pollution from the ship's bunkers, up to a prescribed limit under the Convention on Limitation of Liability for Maritime Claims (LLMC). • Requires owner of ships ≥ 400GT to have mandatory insurance or financial security to cover the liability. • Requires all ships ≥ 400GT to have International Bunkers Pollution Certificate certifying that insurance is in place.	• Protection of the Sea (Civil Liability for Bunker Oil Pollution Damage) Act & Regs.	• None

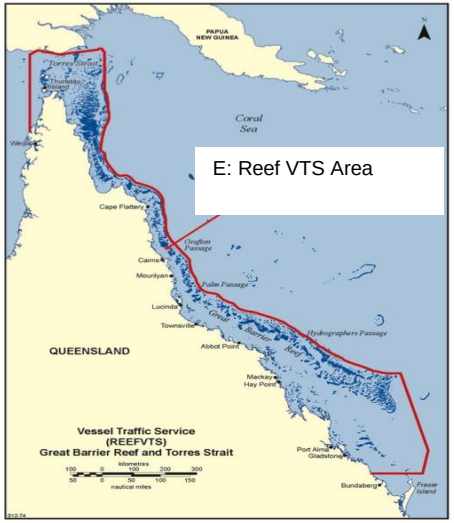
Appendix C Shipping Management Areas for the GBRMP











Shipping Management Areas for the Great Barrier Reef

A: MARPOL 'Nearest Land' baseline
(all MARPOL discharges are measured to seaward of the outer line).

B: Designated Shipping Areas
(GBRMP Zoning Plan).

C: Two Way Routes
(IMO & AMSA Marine Notice 11/2014).

D: Compulsory Pilotage Area
(AMSA Navigation Act 2012 & Marine Order 54).

E: Reef VTS Area
(AMSA Navigation Act 2012 & Marine Order 56).

Appendix D Letter of approval for management plan from Minister

Australian Government
Department of the Environment

Our reference: 2010/5642

Contact Officer: Kahli Beissner
Telephone: (02) 6274 1472 Facsimile: (02) 6274 1878
Email: post.approvals@environment.gov.au

Mr Paul Dewar
General Manager, HS&E
Rio Tinto Alcan - Bauxite and Alumina
123 Albert Street
Brisbane, QLD 4000

Dear Mr Dewar,

EPBC 2010/5642 – South of Embley Bauxite Mine and Port Development– Construction Shipping and Marine Management Plan

Thank you for your email of 2 November 2015 to the Department requesting approval of the *SoE Project Construction Marine and Shipping Management Plan (Final), 30 October 2015,* in accordance with conditions 5 – 8(i) and 12 of the approval decision dated 14 May 2013.

Officers of the Department have reviewed the Construction Marine and Shipping Management Plan and are satistifed that it meets the requirements of conditions 5 – 8(i) and 12 of the approval for this project. On this basis, and as delegate of the Minister for the Environment, I have decided to approve the Construction Marine and Shipping Management Plan. This plan must now be implemented

Should you require any further information please contact Kahli Beissner, Project Officer, Post Approvals Section, on (02) 6274 1472 or by email: post.approvals@environment.gov.au.

Yours sincerely

S. Gaddes

Shane Gaddes
Assistant Secretary
Compliance & Enforcement Branch

19/11/ 2015

Australian Government
Department of the Environment and Energy

Ms Marcia Hanrahan
General Manager Amrun Project
Rio Tinto Alcan Weipa
123 Albert Street
BRISBANE QLD 4000

South of Embley Project, Qld (EPBC 2010/5642)

Dear Ms Hanrahan

Thank you for your letter dated 7 May 2017 to the Department, seeking approval of the *Amrun Project – Construction Marine and Shipping Management Plan, REV 2.1, 19 June 2017* (the plan) in accordance with conditions 5 – 8 and condition 12 of the approval decision EPBC 2010/5642.

Officers of this Department have reviewed and advised me on the plan. On this basis, and as a delegate of the Minister for the Environment and Energy, I have decided to approve the *Amrun Project – Construction Marine and Shipping Management Plan, REV 2.1, 19 June 2017.* The approved plan must be implemented.

In accordance with varied condition 72 of EPBC approval 2010/5642, if the approval holder wants to act other than in accordance with this approved plan, the approval holder must submit a revised plan for approval. Until the Minister (or his delegate) has approved the revised plan, the approved version of the plan must continue to be implemented.

Should you require any further information please contact Ms Panna Patel, Senior Post Approvals Officer, Post Approvals Section, on 02 62759299 or by email: panna.patel@environment.gov.au.

Yours sincerely

James Barker
Assistant Secretary
Assessments (Qld, Tas, Vic) and Governance Branch
Environment Standards Division

26 July 2017