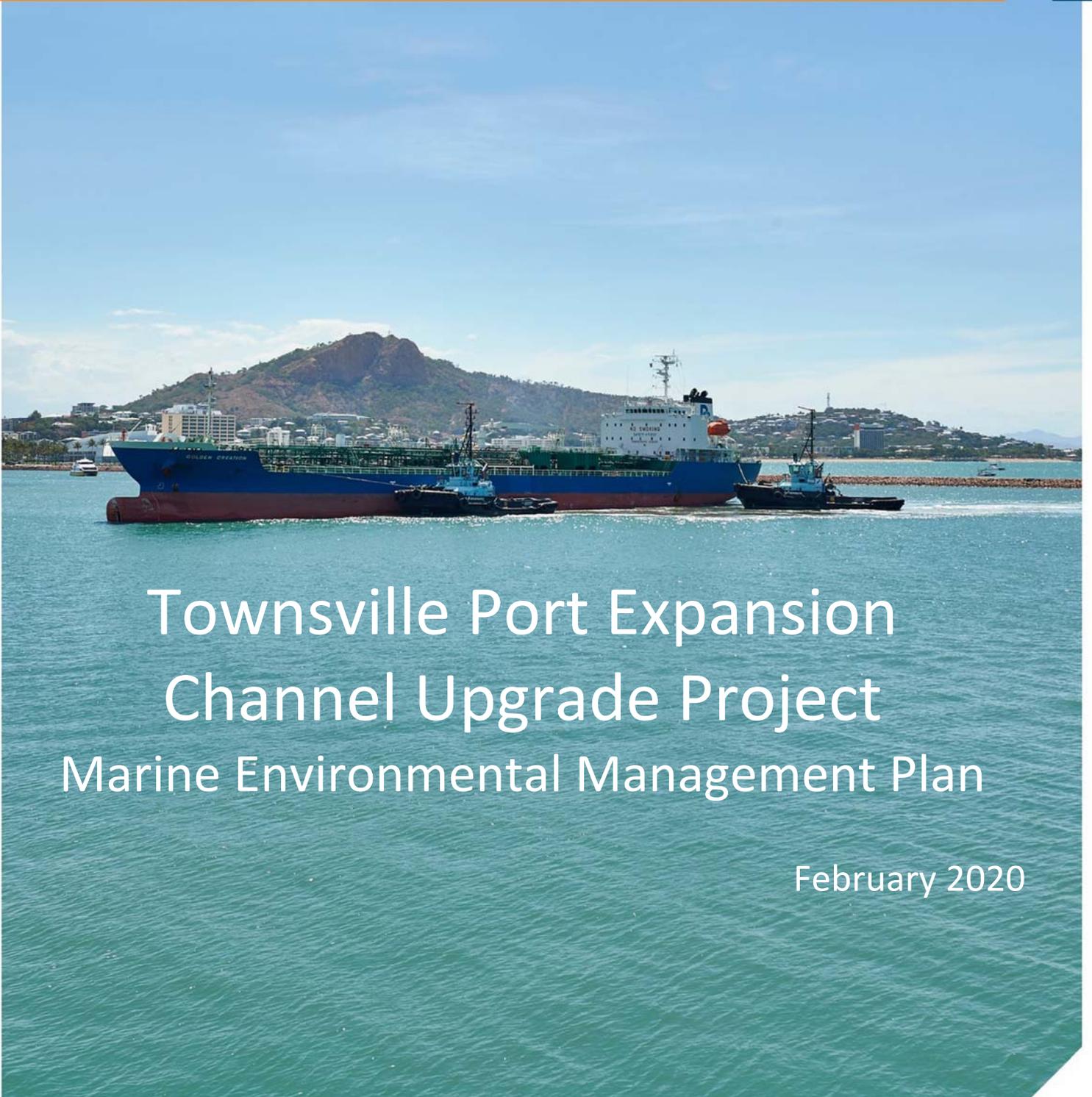


PORT OF TOWNSVILLE LIMITED
PORT EXPANSION PROJECT
CHANNEL UPGRADE



Townsville Port Expansion Channel Upgrade Project Marine Environmental Management Plan

February 2020

Document Control Sheet

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Document approval

Approval of the final MEMP was issued by DAWE on 26 February 2020.

This version of the MEMP is published on the CU Project’s website on 11 March 2020.

This document has been prepared to meet the Commonwealth Government’s EPBC Approval No. 2011/5979 Conditions and the Queensland’s Coordinator General’s Conditions for the Port of Townsville Limited's Port Expansion Project (ACN 130 077 673).

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DECLARATION OF ACCURACY

EPBC Number 2011/5979
Project Name Port of Townsville Port Expansion Project
Approval Holder Port of Townsville Limited
ACN / ABN 130 077 673 / 44 411 774 236
Approved Action To expand the Port of Townsville, in Townsville Queensland. The action is for dredging, land reclamation and construction of infrastructure.
Location of the Action Townsville, Queensland

In making this declaration, I am aware that section 491 of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) makes it an offence in certain circumstances to knowingly provide false or misleading information or documents to specified persons who are known to be performing a duty or carrying out a function under the EPBC Act or the *Environment Protection and Biodiversity Conservation Regulations 2000* (Cth). The offence is punishable on conviction by imprisonment or a fine, or both. I am authorised to bind the approval holder to this declaration and that I have no knowledge of that authorisation being revoked at the time of making this declaration.

Signed



Full name (please print)

Marissa Wise

Organisation (please print)

Port of Townsville Limited

Date 21 / 02 / 2020

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GLOSSARY

AEIS	Townsville Port Expansion Project: Additional Information to the Environmental Impact Statement - Final (June 2017).
ASS	Acid Sulphate Soil
Berth	Any dock, pier, jetty, quay, wharf, marine terminal or similar structure, (whether floating or not) connected to the shore, at which a ship may tie up, not including floating plant, jack-up barge, or other similar structure not connected to the shore
Bunkering	The act of taking in fuel on board a vessel/ship
Capital Dredge Material	Material (clays, silts and sands) derived from capital dredging
Capital Dredging	As defined in the NAGD, being 'dredging for navigation, to enlarge or deepen existing channels and port areas or to create new ones'
CU Project	Channel Upgrade Project
CEMP	Construction Environmental Management Plan
CROC	Compliance Regulatory Oversight Committee
CSSPPP	Construction Ship-Sourced Pollution Prevention Plan
CVTMP	Construction Vessel Traffic Management Plan
DAWR	The Australian Government Department of Agriculture and Water Resources
Department / DAWE	The Australian Government Department of Agriculture, Water and Environment, or any other agency administering the <i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cth) from time to time
DES	Queensland Government Department of Environment and Science
DMP	Dredge Management Plan
EIS	PEP Environmental Impact Statement
EMP	Environmental Management Plan
EMS	Environmental Management System
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
Emergency	Any circumstance which causes, or gives rise to a risk of, serious injury or damage to a person, property or the environment
Exclusion Zone	A radius, from the centre of the pile to be driven, around pile driving operations to minimise the risks of physiological impacts to marine fauna, based on current scientific evidence. The zone must be visually observed at all times during piling driving operations, and where pile driving operations must cease if marine fauna are observed within the relevant radius.
Extreme Weather Events	Includes but not limited to periods of high rainfall, strong winds, very high tides and cyclones

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ITAC	Independent Technical Advisory Committee
Listed Dolphin Species	Australian snubfin dolphin (<i>Orcaella heinsohni</i>) and Indo-Pacific humpback dolphin (<i>Sousa chinensis</i>)
Listed Turtle Species	Green turtle (<i>Chelonia mydas</i>), hawksbill turtle (<i>Eretmochelys imbricate</i>); flatback turtle (<i>Natator depressus</i>); loggerhead turtle (<i>Caretta caretta</i>); olive ridley turtle (<i>Lepidochelys oliveceae</i>); and leatherback turtle (<i>Dermochelys coriacea</i>)
Marine Megafauna	Listed turtle species, dugong (<i>Dugong dugon</i>), listed dolphin species, and all other Cetaceans
Master	A person having command or charge of the vessel
MEMP	Marine Environmental Management Plan
Minister	The Minister administering the <i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cth) and includes a delegate of the Minister
MNES	Matters of National Environmental Significance: In the context of this approval: Great Barrier Reef World Heritage Area, Great Barrier Reef National Heritage place, listed turtle species, listed dolphin species and all other Cetaceans, Dugong (<i>Dugong dugon</i>), Commonwealth marine area and the Great Barrier Reef Marine Park
NAGD	<i>National Assessment Guidelines for Dredging (2009)</i> , as amended or substituted
Observation Zone	The zone whereby the movement of marine fauna should be monitored to determine whether they are approaching or entering the exclusion zone. For whales, dolphins or dugongs, this includes a 2 kilometre horizontal radius from the piling equipment, and for listed turtle species, this includes a 300 metre horizontal radius from the piling equipment. An alternate distance for the observation zone may be considered, if it provides equivalent or better protection to marine fauna, in accordance with Condition 23.
OEMP	Operations Environmental Management Plan
PASS	Potential Acid Sulphate Soils
PEP	Port Expansion Project
Port	The Port of Townsville
POTL	Port of Townsville Limited
Preliminary Works	Includes works of a temporary nature necessary to undertake investigations and to prepare the project area for development
Re-strike testing activities	Testing of an installed pile to confirm that the pile has been installed to the appropriate engineering standards
SDS	Safety Data Sheet
Significant	An event that is important, notable or of consequence, having regard to its context or intensity, and is not temporary in nature.

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Marine Environmental Management Plan

Site	The northern extent of the Eastern Reclaim Area at the Port (Lot 791 on EP2348 Strategic Port Land) and the new reclamation area (not yet a declared lot)
Suitably qualified marine observer(s)	A dedicated and suitably trained person, with demonstrated experience in marine fauna observation, identification and monitoring of marine fauna, distance estimation and reporting. The marine observer must only be tasked with undertaking visual observations for marine fauna whilst they are engaged to do so, and must not have any other duties while engaging in visual observations. This is applicable to piling activities only.
TSHD	Trailer Suction Hopper Dredge – a self-propelled ship with a hold (hopper), and a dredging mechanism comprised of suction pipes connected to draghead(s), by which it can fill the hopper with dredge material
TSS	Total Suspended Solids
Vessel	A Ship, as defined under the TOMPA and a Domestic Commercial Vessel, as defined under the “National Law”

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1. INTRODUCTION

Port of Townsville Limited (POTL) is a Government Owned Corporation established under the *Government Owned Corporations Act 1993* which manages the Port of Townsville (the Port). The Port is located on Cleveland Bay, approximately three kilometres east of the city centre in Townsville, North Queensland (Figure 1). It is a multi-purpose port that handles predominantly bulk and general cargo with a land and sea jurisdiction in excess of 450 km². The Port is situated in the Great Barrier Reef World Heritage Area, outside of the Great Barrier Reef Marine Park. Surrounding the Port of Townsville is Cleveland Bay and the community of Townsville. Townsville is a long-established township with a history of urbanisation and industrial activities in the Ross River and Ross Creek drainage system.

The Townsville Port Expansion Channel Upgrade Project (CU Project) is Stage 1 of POTL’s long-term Port Expansion Project (PEP). The PEP aims to create a series of strategic assets which will address current capacity constraints and accommodate future growth in trade over a planning horizon to 2040. It includes development of port infrastructure, namely work to “top of wharf” facilities, capital dredging; reclamation; breakwaters and revetments; berths; access roads; rail loop; and trunk services and utilities. It does not include the development of “above wharf” infrastructure such as terminal pavements; ship-loaders and unloaders; product conveyors; storage buildings for products; rail loaders and unloaders; stacking and reclaiming equipment; storage tanks; and pipelines, which will be subject to separate statutory assessment and approval requirements prior to the start of their operations.

1.1. Scope

The CU Project involves the supply and haulage of marine-grade armour rock; the construction of a reclamation area; and capital dredging and placement of capital dredge material at the Port. This Marine Environmental Management Plan (MEMP) outlines the environmental management requirements to reduce the potential for negative impacts on Matters of National Environmental Significance (MNES) associated with the CU Project’s activities in the marine environment, particularly:

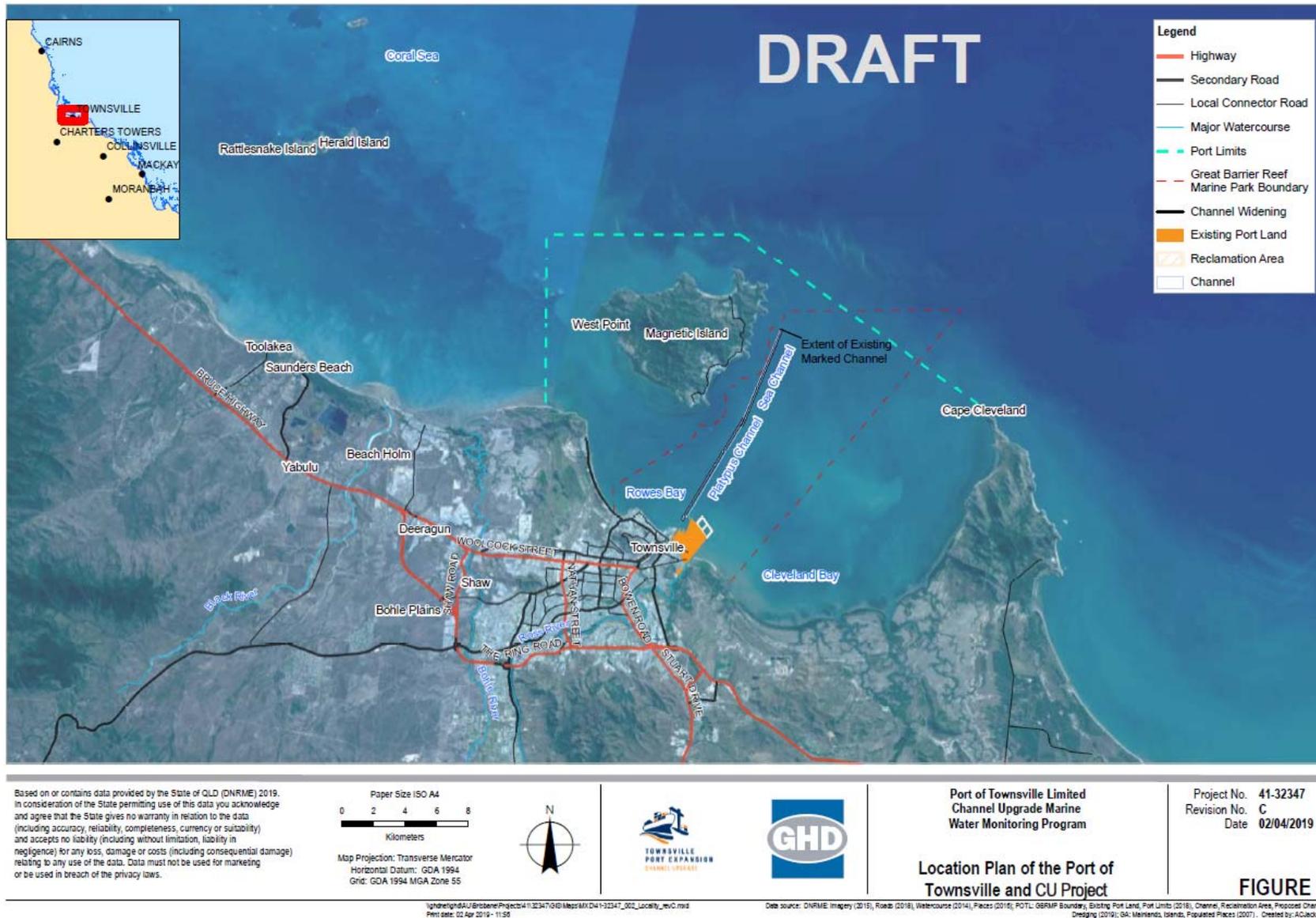
- Construction of the rock walls to form the reclamation area;
- Placement of capital dredge material in the reclamation area; and
- Management of capital dredge tailwater at the reclamation area.

This MEMP is focused on the rockwall and reclamation activities only – the plan will be revised and expanded with dredging related elements and controls prior to commencement of dredging activities.

This MEMP is only one of a number of management plans which will be implemented in the CU Project as listed in Table 1.

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Figure 1: Locality Plan of the Port of Townsville & CU Project



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Table 1: Phases of CU Project & Associated Management Plans

Phase	Management Plan	Description of Content
Rock wall & Reclamation	Offset Management Strategy (Reclamation)	Outlines the offset management strategy for the construction of the rock wall
	Construction Environmental Management Plan (CEMP)	Outlines the overview of the construction and reclamation activities and associated environmental management requirements and contingency plans for extreme weather events
	Marine Environmental Management Plan (MEMP)	Outlines the environmental management requirements for Matters of National Environmental Significance (MNES) from activities in the marine environment
	Construction Vessel Traffic Management Plan (CVTMP)	Outlines the navigational safety and environmental requirements for all vessels during the construction activities
	Construction Ship-Sourced Pollution Prevention Plan (CSSPPP)	Outlines the environmental requirements to prevent pollution from vessels during the construction activities
	Inshore Dolphin Monitoring Plan	Outlines the monitoring program for the inshore dolphins
Capital Dredging	Offset Management Strategy (Dredging)	Outlines the offset management strategy for the capital dredging
	Dredge Management Plan (DMP)	Outlines the overview of the capital dredging activities and associated environmental management requirements and contingency plans for extreme weather events
	Updated Marine Environmental Management Plan (MEMP)	Outlines the environmental management requirements for MNES in relation to the capital dredging activities
	Updated Construction Vessel Traffic Management Plan (CVTMP)	Outlines the navigational safety and environmental requirements for all vessels during the capital dredging activities
	Updated Construction Ship-Sourced Pollution Prevention Plan (CSSPPP)	Outlines the environmental requirements to prevent pollution from vessels during the capital dredging activities
Operations	Operations Environmental Management Plan (OEMP)	Outlines the environmental requirements for operational activities associated with the expanded future outer harbour operations

1.2. Purpose and Objectives

The purpose of the MEMP is to manage risk and reduce the potential for negative impacts on Matters of National Environmental Significance (MNES) associated with the CU Project’s activities in the marine environment. This will be through identifying key risks and impacts associated with the project activities and establishing appropriate and preferred environmental management and controls to address these risks.

It is to be noted that as per Condition 13, the MEMP is being submitted in stages. This MEMP applies to the CU Project only, as stage 1 of the broader PEP. This plan currently relates to the marine activity and conditions associated with the rock bund construction and reclamation and will be expanded to cover dredging component as part of a future submission.

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The key environmental values likely to be affected by the construction activities associated with the CU Project were identified in the PEP Environmental Impact Statement (EIS) and re-assessed in the PEP Additional Information to the Environmental Impact Statement (AEIS). For each key value identified, the environmental management controls to address potential risks and impacts have been provided in this MEMP.

This MEMP has been developed from, and is consistent with, the description and assessment contained within the PEP EIS and AEIS, and sets out the framework for management, mitigation and monitoring of relevant impacts associated with construction activities. It has been developed to include measures that POTL believes are necessary for protection of MNES in the marine environment and to incorporate additional actions/controls as required by approvals/permits/licences that relate to the CU Project.

This MEMP addresses the marine environmental aspects associated with the CU Project only, including:

- avoid or minimise impacts to MNES from construction and operational activities in the marine environment;
- avoid or minimise pollution of the marine environment;
- manage risks associated with extreme weather events; and
- avoid vessel accidents and oil spills from vessels associated with the action.

The principal objectives of this MEMP are to:

- Overview and provide a description of construction activities, methodologies and timing, as covered under this MEMP;
- Identify MNES present in Cleveland Bay and specifically the area of the proposed action;
- Identify potential and actual environmental impacts associated with the proposed action;
- Describes POTL’s commitments regarding environmental performance and the reduction of adverse impacts on MNES;
- Specifies the actions that would be taken to implement the commitments (such as monitoring);
- Provides an action plan to enable delivery of the environmental commitments so they are achieved and implemented; and
- Identifies corrective actions to rectify any deviation from performance standards.

1.3. Legislative Requirements

Environmental assessment for the proposed PEP was undertaken in accordance with the requirements of the Queensland *State Development and Public Works Organisation Act 1971* and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) as it was considered likely to have impacts on the following MNES:

- World Heritage properties (EPBC Act sections 12 and 15A);
- National Heritage places (EPBC Act sections 15B and 15C);
- Wetlands of international importance (EPBC Act sections 16 and 17B);
- Listed threatened species and communities (EPBC Act sections 18 and 18A);
- Listed migratory species (EPBC Act sections 20 and 20A);

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- Commonwealth marine areas (EPBC Act sections 23 and 24A); and
- Great Barrier Reef Marine Park (EPBC Act sections 24B and 24C).

Descriptions of each MNES and a summary of previous survey results for threatened and migratory marine fauna species and their habitats are provided in the EIS / AEIS.

This MEMP has been developed cognisant of legislative requirements set out in Commonwealth and State Government Acts and Regulations, including Acts implementing relevant international conventions where relevant. Port Notices and the Port Land Use Plan have also been taken into account. An overview of the relevant legislation is provided in Appendix A.

1.4. Approvals

The following approvals have been obtained for PEP and the CU Project.

Commonwealth Approvals

- EPBC Approval No. 2011/5979 issued 5 February 2018

Appendix B lists the conditions from this approval relevant to this MEMP.

State Approvals

- Coordinator-General’s Evaluation Report on the Environmental Impact Statement for the Townsville Port Expansion Project issued September 2017 (and all associated operational development permits)

No specific requirement relevant to the establishment of MEMP is required under the State approvals. As noted previously, a number of the actions and controls directed under the conditions of the state approvals will be contained in the relevant management plans and will be implemented via those plans.

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2. PROJECT DESCRIPTION

The CU Project construction activities in the marine environment primarily involves:

- Creation of a 62-hectare reclamation area (Figure 2) via the construction of rock walls and revetments forming receival ponds for beneficial re-use of all capital dredge material from the channel widening works;
- Capital dredging works of approximately 3.9 million cubic metres from the channels using predominately a mechanical dredge, involving:
 - On its western side to widen the Platypus Channel (Figure 3) from 92 metres width to 180 metres (at the harbour entrance) tapering to 135 metres (at the seaward end);
 - On its eastern side to widen the Sea Channel (Figure 3) from 92 metres to 120 metres along its length;
- Installation of navigation aids in alignment with the new channel configuration; and
- Installation of temporary unloading jetty structure to facilitate the reclamation works.

The capital dredging, construction activities and infrastructure development for the CU Project will occur inside the existing port limits, the designated water areas in which navigation falls under the control of the Regional Harbour Master (RHM).

The capital dredge campaign will last approximately 2 to 3 years and dredge approximately 3.9 million cubic metres from the channels predominantly using a mechanical backhoe dredge, with support from a trailer suction hopper dredge (TSHD). All the capital dredge material will be placed within the new reclamation area as part of land reclamation activities. Dewatering and ground improvement of emplaced sediments within this area will be undertaken.

Land-based construction activities will occur on the new reclamation area, namely Lot 794 on SP308904 adjacent to the northern extent of the East Port area, namely Lot 791 on EP2348 (the Site), which is already Strategic Port Land (Figure 2).

Repositioning of the navigation aids will be done in conjunction with Maritime Safety Queensland. An overview of the piling requirements is in the Environmental Procedure for Piling (see Appendix J).

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Figure 2: Lot Plan for CU Project Rock Wall Construction & Reclamation Activities



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Figure 3: Site Plan for CU Project Capital Dredging Activities –Platypus & Sea Channels



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2.1. Marine Construction Activities

This section provides a high-level overview of the marine construction activities associated with the rock wall and reclamation activities for the CU Project. This is not intended to be a detailed description of these activities – the Construction Environmental Management Plan and the Dredge Management Plan for the project will provide detailed methodology information.

ROCKWALL AND RECLAMATION

The CU Project will involve the construction of approximately 2.2km of external rockwall on the North Eastern side of the existing port area.

Rockwall construction will occur from the land side only, with articulated vehicles moving material into the leading area of the wall construction where bulldozers and excavators will place the rockwall material into the sea. Construction of the rockwall will feature the following:

- Construction of the new rock wall will commence perpendicular to the existing reclamation wall with the interface being prepared by removing the existing primary armour only and retaining the existing core and secondary armour.
- The eastern most wall will commence first (next to Ross River), as this wall generally fronts the prevailing swells and winds and will generate a leeward shelter as it progresses. In parallel, the construction teams will build a core wall as an internal bund wall with wall construction to meet along the Northern wall. Once the first cell is completed, the construction teams will commence the western wall to create the western cell.
- Heavy duty geotextile will be placed at the interface and wrapped on the inside between the new and existing walls to ensure continuity in the sedimentation control system for the new reclamation.
- Completion of rock wall including the installation of geotextile and primary outside armour will be completed within 18 months. Completion of the wall is to be sequenced in with commencement of the capital dredge campaign.
- The toe lines of the rock wall will be surveyed and markers placed in the water to allow visual reference for the construction teams.
- Rock wall construction working hours will be Monday-Sunday up to 12 hours per day dependent upon tidal ranges (may need to stand down for part of the day due to tide levels). The site will be closed for Public Holidays and for short periods over the Easter and Christmas breaks to enable all staff and contractors to take leave.

The rockwall construction design will be subject to multiple design criteria assessments, covering a range of factors including design life, geotechnical and rock stability and settlement design. The outcomes of these assessments will be compared to relevant Australian Standards or design guidelines, to confirm the basis for design. These requirements and standards are detailed in the Reclamation Integrity Plan, a sub-plan of the CU Project CEMP. Further, POTL will ensure that the final constructed rockwall is certified by a Registered Professional Engineer of Queensland (RPEQ) as having been constructed in accordance with the approved design plans, the applicable regulations and good engineering practice.

All the capital dredge material from the project will be placed within the new reclamation area as part of land reclamation activities. Reclamation activities will be undertaken 24 hours per day, seven days per week sequenced in with the capital dredge activities. The capital dredge material will be transported in barges to a designated unloading area within the reclamation structure. to facilitate the efficient discharge of capital dredge material from the barges

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The barge activities transiting between the reclamation and dredge work fronts will be considered further in the dredging works (Dredge Management Plan) and is not covered as part of this rockwall and reclamation submission.

Once dredge materials have been brought to the reclamation area, civil equipment will unload the capital dredge material to form a construction capping layer. Dewatering and ground improvement of emplaced sediments within the reclamation area will be undertaken and covered as part of the tailwater management plan as included as part of the CEMP.

INSTALLATION OF NAVIGATIONAL AIDS

A key component of the CU Project works will be the installation of navigational aids. This will be in the form of:

- a) Installation of temporary navigational aids in and around the construction site; and
- b) re-alignment of the permanent channel marker navigational beacons with the new channel configuration.

The installation of these aids will be undertaken using approved installation techniques, incorporating piling and anchoring.

MARINE PLANT

During the rockwall and reclamation works, the marine construction vessels and plant to be utilised will be limited to a small number of work boats and domestic piling barges and associated tugs. Primarily these vessels will be a small vessel (<5m) and will be used for survey, observation and rescue activities. Piling activities will be limited in this phase of the works to piles to enable the temporary unloading platform to be constructed and will need to be undertaken using marine barges and tugs. The piling is expected to occur for a period of up to 3 months.

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3. ENVIRONMENTAL MANAGEMENT SYSTEM

The POTL Environmental Management System (EMS) complies with all applicable requirements contained in ISO 14001:2015 and encompasses environmental operations conducted at all POTL facilities. POTL Management are committed to the development and implementation of the EMS and to the facilitation of the continual improvement of environmental performance by:

- Integrating environmental considerations and risk-based thinking into decision making and work practices;
- Providing an effective mix of resources to achieve sustainable development and outcomes;
- Utilising systems which act to minimise the risk of environmental impacts through the identification reporting, assessment, monitoring and control of environmental risks; and
- Maintaining a high level of environmental awareness throughout the Corporation and the wider port Community.

This MEMP includes the work elements necessary to satisfy environmental requirements in the construction phase of the CU Project and generally complies with applicable elements of POTL’s EMS. Executive management responsibilities, incident management, emergency response, non-conformances, environmental training, monitoring, reporting, auditing and complaint handling for the CU Project will be controlled in accordance with POTL’s EMS and other integrated management documents. CU Project environmental records will be controlled in accordance with POTL’s integrated management system and will be:

- Kept as objective evidence of compliance with environmental requirements; and
- Maintained according to POTL’s Recordkeeping Procedure.

Continuous improvement is a mandatory requirement of POTL’s EMS. As part of the continuous improvement, this MEMP will be updated or amended annual, or as required. Any future amendments will take into account the scope and purpose of this document and the conditions of the existing approvals.

3.1. Environmental Policy

POTL’s Environmental Policy (Figure 4) identifies POTL’s key environmental objectives and sets the direction of the EMS and environmental management within the organisation, including at the construction site. The Environmental Policy is:

- Displayed at prominent locations in the workplace of POTL site personnel;
- Communicated to all POTL site personnel during induction and training; and
- Reviewed and updated regularly.

All POTL site personnel, contractors and visitors must comply with the spirit and intent of the policy and with the requirements stated below from the *Environmental Protection Act 1994*.

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Figure 4: Environmental Policy



ENVIRONMENTAL POLICY

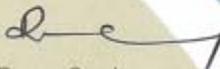
POTL is committed to sustainable development and operation through responsible environmental management and continual improvement of environmental performance and the effectiveness of its Environmental Management System.

To achieve corporate performance consistent with this policy, POTL will:

- Integrate environmental considerations and life cycle thinking into decision making and work practices related to POTL's core functions.
- Maintain a high level of environmental awareness throughout POTL and the wider port community
- Require and encourage employees to work in an environmentally responsible manner.
- Implement systems which act to minimise the risk of environmental harm through the identification, reporting, assessment, monitoring and control of environmental risks.
- Establish a framework for setting and reviewing environmental objectives and targets and measuring POTL's performance.
- Establish and maintain systems for assessing the environmental impacts associated with POTL's activities.
- Comply with all relevant legislation, codes of practice and standards.
- Conduct core functions in a manner that will minimise waste, prevent pollution, promote efficient use of resources through life cycle thinking, reduce environmental impacts, and continually improve environmental and management system performance.
- Provide adequate resources and training to facilitate the fulfilment of POTL's environmental responsibilities.

POTL's Board, Executive and management are responsible for providing the leadership to support the development and implementation of this Policy and for ensuring it is effectively applied.

This policy will be regularly reviewed following legislative or organisational changes, or as a minimum, every three years.


 Raneë Crosby
 Chief Executive Officer

June 2017

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4. GOVERNANCE & MANAGEMENT REVIEW

4.1. Development of the MEMP

The MEMP has been developed in consultation with key stakeholders including:

- Construction teams and works designers.
- Representatives of the Traditional Owners, the Gurambilbarra Wulgurukaba people who are identified as the Native Title claimants of the land covering the Project area;
- POTL’s Community Liaison Group (CLG), which comprises a number of community representatives;
- Environmental, engineering and modelling consultants (where applicable);
- The CU Project Steering Committee, which comprises members of the POTL Executive Management Team; and
- The Commonwealth Department of Agriculture, Water and the Environment (DAWE).

Traditional Owners were consulted in accordance with Condition 25 of EPBC Approval No. 2011/5979 during the development. This consultation involved the following:

- An initial presentation to Traditional Owners on the CU Project on 20 February 2018;
- The draft MEMP was subsequently presented to a meeting of the nominated Traditional Owners representatives on 30 May 2019. Comments raised were noted during the meeting with the Traditional Owners Working Group asked to provide any further comments on the MEMP within a nominated timeframe. All comments received from Traditional Owners were compiled, with only generic queries raised in relation to the MEMP and its related aspects. A copy of all comments made by the Traditional Owners Working Group was provided to the Minister with the MEMP;
- An update regarding the consultation with the Traditional Owners Working Group was then presented to the CU Project Steering Committee, which formally noted that the Traditional Owners Working Group had been consulted in relation to the MEMP development.

4.2. Independent Peer Review of the MEMP

In accordance with Condition 31 of EPBC Approval No. 2011/5979, the draft MEMP and associated monitoring plans were independently peer reviewed by GHD Pty Ltd (who have not been directly involved with either the rock wall design or construction planning) before submission to the Minister for approval. This review included an analysis of the effectiveness of the outcomes, targets or management measures identified in the MEMP (Condition 32). Relevant monitoring plans (i.e. Megafauna Monitoring Plan, Inshore Dolphin Monitoring Plan) associated with the MEMP were also reviewed by the CU Project ITAC.

A copy of all advice and recommendations made by the independent peer reviewer, including feedback on POTL changes, was provided to the Minister with the MEMP at time of submission (per Condition 33).

4.3. Finalisation & Approval of MEMP

The draft MEMP was submitted on 07/08/2019 for the Commonwealth Minister for the Environment’s approval to meet the submission timing requirements of EPBC Approval No. 2011/5979 Condition 12.

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4.4. Implementation

A copy of the approved MEMP will be kept on-site and implemented for the duration of the works and be easily accessible. This MEMP will not be implemented or amended in any way that contravenes any conditions of any development approval / permit or environmental authority. The Project Director CU must ensure that all measures necessary to ensure compliance with any conditions of any development approval / EPBC Act Approval / permit or environmental authority are taken / installed / maintained and operated.

The MEMP will include a number of activities and strategies incorporated in the CEMP (and the DMP once developed) and the MEMP will be revised in line with any amendments to relevant aspects of these Management Plans.

4.5. Organisational Structure & Responsibilities

A clear organisational structure for the CU Project, including key responsibilities and reporting lines (Figure 5) will be implemented to achieve the over-arching objective of sound operational and environmental management at the site with the least possible impacts on the environment. Authorities and responsibilities for the environmental management of the relevant construction activities are defined and communicated in Position Descriptions and CU Project documentation. The key responsibilities and authorities are included below. Appendix C lists contact details relevant for the Project.

Project Management

The General Manager Infrastructure and Environment (GM I&E)'s key responsibilities are to:

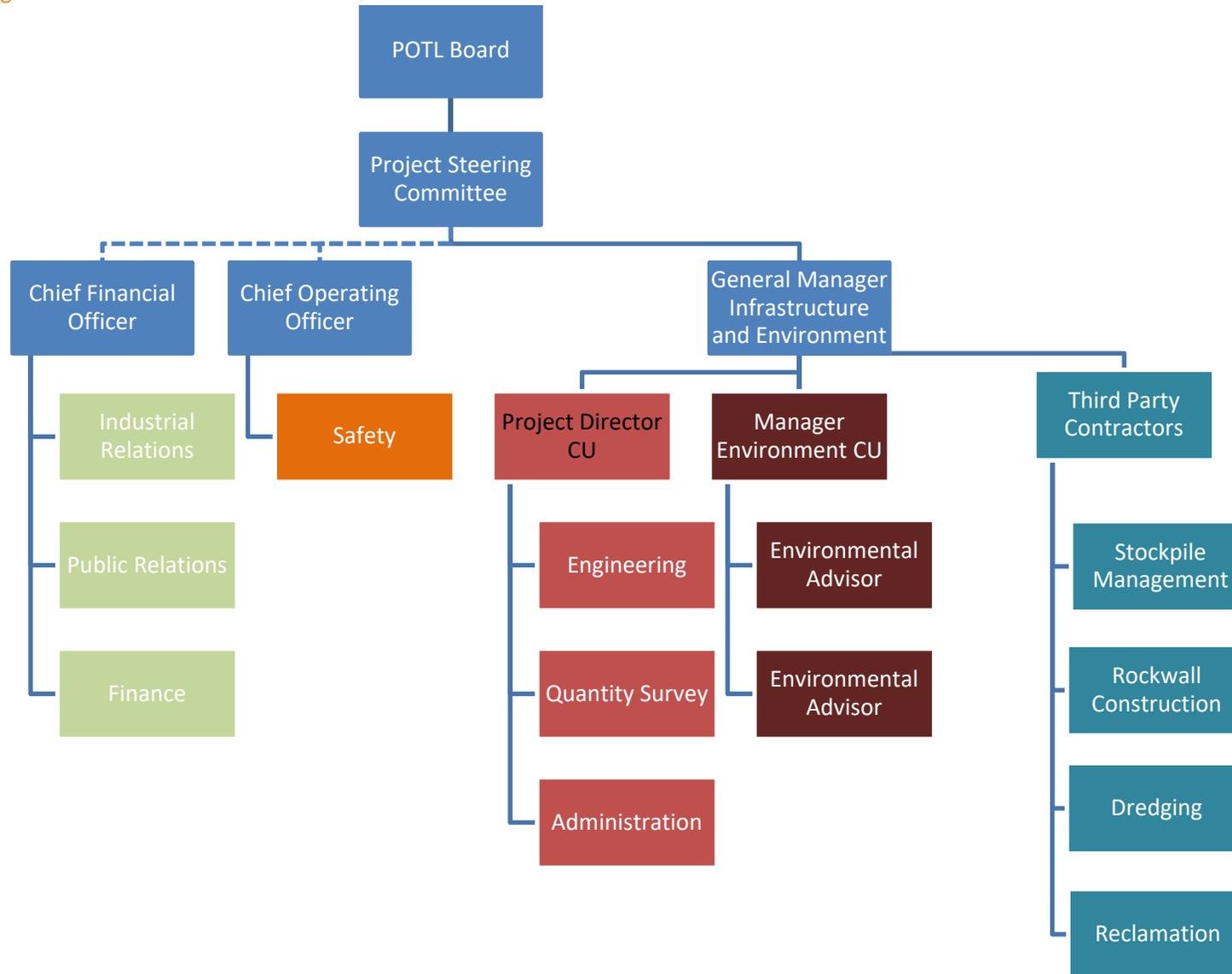
- Represent POTL's interests and requirements in the CU Project;
- Oversee the CU Project and its execution; and
- Provide final approval of all project documentation.

The Project Director CU's key responsibilities are to:

- Manage the CU Project and its execution, including providing adequate resources for environmental management requirements;
- Ensure that project responsibilities and authorities are define and communicated;
- Approve this MEMP, and all project documentation;
- Report to senior POTL management on the performance of the project and environmental non-conformances etc.; and
- Liaise with regulators, in coordination with the Environmental Advisors CU, including reporting environmental incidents and complaints to the relevant regulator(s).

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Figure 5: CU Project Organisational Chart



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The Manager Environment CU’s key responsibilities are to:

- Ensure that all relevant licenses / permits / approvals are in place prior to any works being undertaken;
- Ensure that all CU Project personnel, including contractors, are familiar with the Safety Management Plan, this MEMP, statutory approvals and legislative requirements, Australian Standards and any relevant Code of Practice and/or Industry Standard and are aware of all requirements and their responsibilities;
- Monitor and review technical, environmental and quality performance of the project including the implementation of this MEMP (and other management plans), refining procedures as necessary to ensure relevant management measures are implemented effectively and adaptive management / corrective action is taken in a timely manner;
- Take action to resolve environmental non-conformances and incidents; and
- Report to the GM I&E on the performance of the project and technical, environmental and quality non-conformances etc.

The Environmental Advisor CU’s key responsibilities are to:

- Support the CU Project Team in day-to-day management of environmental performance;
- Review compliance with all environmental legislative requirements, approvals, permits and management plans and liaise with relevant regulators;
- Ensure that all CU Project personnel receive appropriate environmental induction and training and are aware of their environmental responsibilities;
- Ensure environmental monitoring is completed in accordance with approved management and monitoring plans;
- Monitor, investigate and report on environmental performance, environmental incidents, environmental complaints and environmental non-conformances and ensure corrective actions are implemented within reasonable timeframes as required by the CU Project’s Environmental Management Plans (including this MEMP);
- Conduct environmental inspections and audits and report to the Manager Environment CU on the environmental performance and improvement opportunities;
- Review contractor environmental management plans;
- Verify that environmental non-conformances, incidents and complaints are recorded, and written reports provided and liaise with the Project Director CU to confirm the nature and adequacy of any corrective actions required; and
- Ensure that environmental records and files are collected and maintained.

The Project Engineer CU’s key responsibilities are to:

- Manage day-to-day the construction and reclamation activities under the direction of the Project Director CU, including providing sufficient resources to ensure the MEMP (and other CU Project Environmental Management Plans) controls are implemented effectively;
- Ensure that all CU Project personnel operate in accordance with the Safety Management Plan, this MEMP, statutory approvals and legislative requirements, Australian Standards and any relevant Code of Practice and/or Industry Standard;

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Marine Environmental Management Plan

- Ensure all CU Project personnel under their direction are appropriately qualified and trained;
- Facilitate regular environmental inspections by the Environmental Advisors CU and on-site monitoring as required under management and monitoring plans;
- Report all environmental non-conformances and incidents to the Project Director CU and/or Environmental Advisors CU and facilitate any investigations; and
- Coordinate the response to environmental non-conformances, incidents and complaints through implementation of corrective actions, where necessary.

Project Contractors

All contractors will report to the CU Project management and have management systems in place to meet or exceed POTL’s requirements.

The key environmental responsibilities of all CU Project Contractors, including sub-contractors, are to:

- Manage day-to-day the construction and reclamation activities, including providing sufficient resources to ensure the MEMP controls are implemented effectively;
- Ensure that all personnel operate in accordance with the Safety Management Plan, this MEMP, statutory approvals and legislative requirements, Australian Standards and any relevant Code of Practice and/or Industry Standard;
- Ensure all staff are appropriately inducted and trained;
- Comply with the environmental policy and EMS procedures;
- Maintain appropriate qualifications;
- Seek necessary guidance and advice regarding environmental requirements;
- Ensure that all equipment is maintained and “fit for purpose” of the required task;
- Facilitate regular environmental inspections by the Environmental Advisors CU and on-site monitoring as required under management and monitoring plans;
- Report environmental non-conformances, incidents, complaints and any corrective actions taken to the Project Engineer CU and/or Project Director CU; and
- Coordinate the response to environmental non-conformances, incidents and complaints through implementation of corrective actions, where necessary.

4.6. Personnel Induction, Training, Awareness & Competence

All CU Project personnel including contractors must attend a compulsory induction prior to commencing work at the site, which covers general environmental management requirements, site-specific and work-specific risks, and site-wide controls and mitigation measures. The environmental component of the induction will include, but not be limited to:

- Relevant legislation and approvals, General Environmental Duty and Duty to Notify and Cultural Heritage Duty of Care responsibilities and the implications of failing to fulfil these duties;
- Key sensitive areas, Great Barrier Reef World Heritage Area and MNES;
- Environmental values and management requirements and responsibilities under the MEMP (and other environmental management plans);

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Marine Environmental Management Plan

- Implementation of mitigation measures and corrective actions and reporting of environmental incidents and complaints;
- Environmental emergency response procedures (i.e. spill kit locations) and training in the use of this equipment; and
- Staff code of conduct and behaviour.

An induction register will be maintained to record induction attendance for all staff, contractors and visitors. All CU Project personnel attending the induction will be instructed that all external communication pertaining to the Project is to be conducted by the Project Director CU.

To assist with managing environmental risks associated with the works, a training plan will be developed, identifying training requirements for each position within the Project in order to support the implementation of mitigation measures and corrective actions. Specific environmental and cultural heritage training will be developed for various roles and personnel, such as marine fauna observers, on an as needs basis. A training register will be maintained to record attendance at the training sessions.

All CU Project personnel will attend regular toolbox talks which will include raising environmental awareness and educating personnel on environmental issues related to all aspects of construction.

4.7. Continuous Improvement

This MEMP will be subject to regular review.

It is a “living document” which requires review at least annually during the construction phase. During delivery, review and amendment will also be completed as necessary to ensure the Plan remains relevant and achieves the required objectives, inclusive of identification and implementation of any new or changing environmental risks and mitigation actions. Recommendations on improvements or amendments will be reported as part of the annual reporting process.

Feedback mechanisms will be in place for the duration of the CU Project to enable this MEMP to be updated and responsive to learning from any incidents, complaints and ongoing monitoring results.

A key trigger for review of the MEMP and associated management actions will be as a result of the adaptive management arrangements associated with the key monitoring activities that will be implemented to support the project. As noted in all monitoring and sub-management plans, where the monitoring undertaken identifies the need for revised management actions, the MEMP will be revised to incorporate the adaptive management arrangements.

Other triggers for MEMP review may include:

- Changes to organisational structure, roles and responsibilities;
- Changes in environmental legislation and/or policies; and
- New technologies / innovation relevant to applied methods and mitigation measures that provide innovative means of executing activities in order to meet performance criteria.

As noted previously, the MEMP includes a number of activities and strategies incorporated in the CEMP and the DMP (once developed), as a result the MEMP will be revised in line with any amendments to relevant aspects of these Management Plans.

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Changes to the MEMP may be developed and implemented in consultation with relevant regulators and other stakeholders over time. All changes are to maintain the approval conditions and be approved by the CU Project Management, before implementation.

If the revised MEMP meets Condition 38 of EPBC Approval No. 2011/5979, DAWE will be notified in writing and provided with an electronic copy of the revised plan. Otherwise, revised MEMP will be submitted to the Minister for approval.

4.8. Environmental Emergency Contacts and Procedures

Environmental incident and emergencies will be managed in accordance with the CU Project Emergency Response Plan. This plan is part of the POTL Emergency Response Strategy and will address a range of emergency situations and relevant procedures. This will include Cyclone preparedness and response.

Specific response activities are also identified in the relevant element with this MEMP, the CEMP and the DMP (once developed).

Key Project contacts are listed in Appendix C. Environmental emergencies will be reported to the relevant line manager in the first instance for initial response, primarily the Project Engineer and Project Director CU. Additionally, the project Environmental Advisor CU (and Environmental Manager CU) will be notified and provide technical advice and input on the incident and the most appropriate response. As per all incidents within the port, notification to the Port Tower/Duty Officer will be made.

The General Manager Infrastructure and Environment will also be notified and provide a key role in notification and reporting to POTL Executive and relevant regulators.

4.9. Environmental Incidents

All CU Project personnel and contractors will report all environmental incidents and near misses to the Project Engineer CU, who will notify the Project Director CU and the Environmental Advisor CU (Key Project contacts are listed in Appendix C). Examples of environmental incidents include:

- Fuel/Chemical spills;
- Fire and/or uncontrolled explosions;
- Vessel incidents or interactions with marine megafauna;
- Major sediment and erosion control failure; and
- Uncontrolled release of stormwater/tailwater from the reclamation area.

An Environmental Incident Investigation Form (POT 1979) will be completed, any impacts will be assessed and corrective actions will be implemented during the investigation of any incident. The Environmental Advisor CU is responsible for maintaining a Register of Incidents; investigating incidents and near misses; maintaining records of incident and near miss investigations, including corrective actions undertaken and persons/regulators notified.

The Project Director CU will provide an Environmental Incident Written Notice Form (Appendix D) or Marine Pollution Report (POLREP) to the appropriate regulator within 24 hours of any significant incident. Any marine megafauna interactions (marine animal strike, marine stranding or an injured, sick or dead turtle, dugong, dolphin or whale) will be reported to the Qld Department of Environment and Sciences (on 1300 130 372).

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4.10. Environmental Inspections, Non-Conformances & Preventative/Corrective Actions

Project worksite inspections will be carried out daily. These inspections will be documented, and deficiencies/non-conformances recorded. Non-conformances include:

- An incident or near miss with potential or actual environmental impact on MNES;
- Reasonable and justifiable complaints regarding the project construction activities in the marine environment;
- Not meeting an objective or performance criteria in the MEMP, and
- Environmental inspections not undertaken within the nominated timeframe.

The Manager Environment CU is responsible for identifying and implementing any preventative and/or corrective actions in response to any non-conformances. New preventative and corrective actions will be incorporated into the MEMP where appropriate.

4.11. Monitoring

Monitoring for each element is detailed in Section 6, with Section 7 providing the specific monitoring programs being implemented for particular MNES. This monitoring will enable:

- a) Development of baseline, or pre-construction, environmental information from which trends and changes in the environmental quality during the CU Project can be detected; and
- b) Early detection of environmental management issues during construction activities.

All monitoring equipment will be maintained and calibrated in accordance with the manufacturer’s instructions and operated by an appropriately qualified person.

Records of all monitoring will be maintained as per section 4.14.

4.12. Auditing

Environmental audits of the construction activities of the CU Project will be scheduled and conducted in accordance with the Port’s EMS requirements. The audit’s objectives will be to verify compliance with relevant Project Management Plans, applicable Commonwealth, State and Local government environmental permits, approvals and regulations. Auditing will occur as a minimum annually, with specific aspects of the construction activity to be audited as required in response to specific risks or incidents of concerns being identified. Audits will be undertaken within the POTL Quality Management Framework.

Audits of the requirements of the MEMP (including legislative changes) will be undertaken by a suitably qualified person. This is to ensure that the measures, responsibilities and corrective actions remain achievable, effective and suitable to the construction activities at all times.

Records of on-going site monitoring, inspections etc. will be maintained for review by regulators. Permanent records will be kept on-site and updated regularly, to enable audit/review.

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4.13. Reporting

As required in legislative conditions, an annual report will be produced by the Environmental Advisors CU within three months of every 12 month anniversary of commencement of the action. The report will include, but not be limited to:

- i) Compliance with the conditions of the EPBC Approval 2011/5979 and relevant State approvals;
- ii) Outcomes of environmental monitoring and periodic reviews of the MEMP, particularly against any performance indicators;
- iii) A register of any environmental incidents;
- iv) A register of environmental complaints; and
- v) A list of performance criteria that have not been met, a description of any potential environmental impacts identified, and the corrective actions taken to address.

Copies of any annual report(s) will be kept on-site, will be published on the CU Project website in accordance with Condition 36 of EPBC Approval No. 2011/5979 and will be available for regulatory inspection.

POTL will report to DAWE (or successor agency) any exceedance of performance criteria and early-warning trigger levels, along with the implemented risk management, adaptive management strategies, corrective actions or emergency response measures, within 21 days of an exceedance or action/response.

4.14. Records

During construction activities in the marine environment, records relevant to the MEMP will be maintained as objective evidence of compliance with environmental requirements. All records will be maintained according to POTL’s Record Keeping Procedures and be kept for a minimum of five (5) years after the completion of the project or as required by the legislative conditions. All MEMP records will be retained electronically, including but not limited to:

- a) Induction and any specific environmental training records;
- b) MEMP management meeting agendas and minutes;
- c) MEMP reviews and version control;
- d) Monitoring data sheets, calibration records, results and internal and external environmental reports; and
- e) Environmental incidents, complaints and non-conformance and corrective action reports.

Records will allow auditing and encourage the use of preventative action, as well as corrective action following any non-conformances. Records will be made available to the regulators as requested.

4.15. Internal Communication

MEMP requirements will be included in daily “tool box” meetings, which are to be performed prior to undertaking work. As part of this meeting, the proposed activities will be reviewed with consideration given to changes in conditions such as weather, which may increase the potential for environmental impacts.

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4.16. Community & Stakeholder Engagement

Contact details for the CU Project are:

Telephone: 1800 531 561

Email: cugeneral@townsvilleport.com.au.

Address: PO Box 1031, Townsville QLD 4810

Contact can also be made electronically via POTL’s website “Contact Us” page (<https://www.townsville-port.com.au/contact/>).

A Community and Stakeholder Engagement Plan (CSEP) has been developed which details the engagement methods which will be used during the CU Project. This document is published on POTL’s website (<https://www.townsville-port.com.au/channel-upgrade/project-schedule/>). Consultation on the implementation of the MEMP will be undertaken through the mechanisms established in the CSEP.

4.17. Complaints Handling

Complaints represent an opportunity for improvement and enhancement of environmental performance. All complaints relating to the construction activities of the CU Project, including those from members of the public, stakeholder groups and regulators, will be investigated and responded to in accordance with the complaints process detailed in the CU Project’s Community and Stakeholder Engagement Plan. Complaints received directly by the Public Relations Officer CU must be recorded, including investigations undertaken, conclusions formed and actions taken. Complaints can be made verbally, via email or via the “Complaint Lodgment Form” http://www.townsvilleport.com.au/complaint_form on POTL’s website. The Public Relations Officer CU will notify the CU Project Team Line Managers who will assign a lead (pending on nature of complaint), to investigate and insert corrective measures where required.

The Public Relations Officer CU is responsible for maintaining the Register of Complaints. Notification regarding the complaint and any associated response will be provided to POTL Management in a timely fashion and all outcomes of complaint(s) will be communicated to POTL Management for further review. The outcome of the investigation and corrective actions, where required, will be communicated to the complainant to close out the issues raised.

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5. MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

This MEMP has been developed to address key risks from the approved action on Matters of National Environmental Significance (MNES). Key MNES for this project include:

- Great Barrier Reef World Heritage Area;
- Great Barrier Reef National Heritage place;
- listed turtle species;
- listed dolphin species and all other Cetaceans;
- Dugong (*Dugong dugon*);
- Commonwealth marine area; and
- the Great Barrier Reef Marine Park.

Table 2 lists the key species of each megafauna taxa identified to have been observed within the area of the port as part of the EIS/AEIS:

Table 2: Key Species of Megafauna Taxa

Taxa	Species
Listed Turtle Species	Loggerhead turtle (<i>Caretta caretta</i>)
	Leatherback turtle (<i>Dermochelys coriacea</i>)
	Olive ridley turtle (<i>Lepidochelys olivacea</i>).
	Green turtle (<i>Chelonia mydas</i>)
	Hawksbill turtle (<i>Eretmochelys imbricate</i>)
	Flatback turtle (<i>Natator depressus</i>).
Dugong	Dugong (<i>Dugong dugon</i>)
Listed Dolphin Species	Australian snubfin dolphin (<i>Orcaella heinsohni</i>)
	Indo-Pacific humpback dolphin (<i>Sousa chinensis</i>).
Other Cetaceans	Whales, especially Humpback Whale
Listed and Migratory Shorebirds	Various

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6. MEMP ACTIVITIES & ELEMENTS

There are several activities taking place during the CU Project which have the potential to impact on the marine environment, including but not limited to:

- Reclamation works;
- Rock wall construction;
- Land based construction and administration activities, including rock haulage and stockpiling;
- Capital dredging; and
- Use of water based vessels and plant for dredging activities.

This plan currently relates to the marine activity and conditions associated with the rock bund construction and reclamation; and will be expanded to cover dredging component as part of a future submission.

This section of the MEMP comprises the environmental values, as identified in the EIS / AEIS, with potential environmental issues, risks and impacts associated with project activities in the marine environment.

Where relevant, this MEMP refers to other documents that are relevant to the activity, such as the CEMP (POT 2099) and DMP (currently being developed). This MEMP will be revised in line with any amendments to relevant aspects of the other Management Plans to ensure consistency across the suite of management plans relevant to the project.

Mitigation of some potential impacts, such as the removal of marine habitat through reclamation, will be considered through potential offsetting opportunities rather than construction management measures, and are not included in detail in this MEMP, (see POTL Offset Management Strategy POT 2094).

6.1. Risk Assessment of Environment Elements

A number of construction activities have the potential to impact on environmental values in the marine environment and MNES to varying levels. The risk posed to key elements has been assessed for the CU Project, based on the risk management guidelines within POTL’s Quality Management System (risk tables reproduced in Appendix E).

The residual risk level for each element has been detailed in Table 3. These elements and risks have been subject to detailed analysis in the EIS and AEIS, with key issues to be addressed by this MEMP also identified in the EPBC Approval conditions.

The residual risk level identified for each element is in relation to the CU Project specifically; and therefore, may be refined in the context of scope of works being delivered in the CU Project (Stage 1) from the AEIS assessment. This residual risk level has been included in each element to ensure that it effectively links to actual mitigation and management actions.

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Table 3: Risk Overview for the key Activities and Elements.

Element	Primary Impacting Process	Potential Impact	Risk Receptor	Raw Likelihood / Consequence (risk rating)	Mitigation Measures	Residual Risk
Land Contamination Impacts	Failure of integrity of the rock wall has the potential to release dredge material to the marine environment.	Release of dredged material	Sensitive receptors, in close proximity to Rockwall	Possible / Major (Substantial)	Refer to section 6.4.1	Medium
	PASS material if not handled correctly could result in contamination of the land and release of contaminants to the marine environment.	Release of contaminants to marine environment	Marine Megafauna	Unlikely/ Insignificant (broad scale) (Low)		Low
	Spills and leaks of dangerous goods/hazardous materials can cause soil contamination and release of contaminants to the marine environment.			Likely / Minor (local scale) (Medium)		Low
Reclamation Footprint impacts	The construction of the land reclamation removes, and fragments habitat used by megafauna in Cleveland Bay. Seagrass meadows in the reclamation footprint are destroyed removing habitat for megafauna.	Removal of habitat may result in long term disturbance or behavioural change to marine megafauna	Sensitive receptors, in close proximity to Rockwall Marine Megafauna	Possible / Minor (Medium)	Refer to section 6.4.2	Low
Water quality (Stormwater & tailwater)	Sediment in stormwater run-off from construction activities leading to increased turbidity of marine waters Exposure and potential release of sediments and contaminants from construction activities and stormwater Stormwater contamination may arise due to leaks and spills of fuel/oil and other hazardous materials or dangerous goods.	Release of contaminants to marine environment leading to impacts on: <ul style="list-style-type: none"> marine water and marine sediments indirect impacts on marine life, indirect potential impacts to human health 	Sensitive receptors, in close proximity to Rockwall	Likely / Minor (local scale) (Medium)	Refer to section 6.5	Low
			Marine Megafauna	Likely / Minor (local scale) (Medium)		Low
			Indirect on human health	Likely / Minor (local scale) (Medium)		Low

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Element	Primary Impacting Process	Potential Impact	Risk Receptor	Raw Likelihood / Consequence (risk rating)	Mitigation Measures	Residual Risk
	Discharge of tailwater may create turbid plumes potentially immediately adjacent to the tailwater discharge point.			Possible / Minor (local scale) (Medium)		Medium
Vessel Strike and accidents	Increased vessel movements may increase Interactions between project related vessels and marine megafauna.	Interactions and strikes with vessels may result in disturbance, injury or death of marine megafauna	Marine Megafauna	Unlikely / Major (Medium)	Refer to section 6.6.1	Medium
	Increased vessel movements may increase vessel strikes with marine megafauna.			Unlikely / Major (Medium)		Medium
Rockwall construction impact/ strike	Interaction between placement of rockwall material and marine megafauna	Interactions and strikes during rockwall construction may result in disturbance, injury or death of marine megafauna	Marine megafauna	Possible / Major (Substantial)	Refer to section 6.6.2	Medium
	Equipment strikes with marine megafauna during rockwall construction			Possible / Major (Substantial)		Medium
	Underwater noise emissions and vibration from construction activities	Noise and vibration may lead to behavioural disturbance to marine megafauna, including temporarily avoiding affected area.		Possible / Major (Substantial)		Medium
Terrestrial Fauna (avifauna)	Construction activities (vehicle movements and earthworks) causing direct impact	Direct impacts may result in disturbance/ injury/ mortality of terrestrial fauna,	Shorebirds	Possible / Serious (Medium)	Refer to section 6.7	Medium
	Noise emissions and vibration from construction activities	Noise and light disturbance may lead to disorientation and behavioural disturbance		Possible / Serious (Medium)		Medium

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Element	Primary Impacting Process	Potential Impact	Risk Receptor	Raw Likelihood / Consequence (risk rating)	Mitigation Measures	Residual Risk
	Light spill from the construction site and plant and equipment	to fauna and surrounding avian habitats.		Likely / Serious (Substantial)		Medium
Invasive marine pests / Introduced pests	Incorrect handling, storage of materials and waste and stormwater management may encourage pests and provide breeding habitats for mosquitos.	Encouraging pests and mosquitos can lead to human health impacts	Shorebirds Human comfort/ health	Possible / Minor (Medium)	Refer to section 6.8	Low
	All dredges and dredge-related vessels brought in from outside the Port may potentially carry marine pests in their ballast water or hulls.	Marine pests have the potential to adversely impact on the marine ecology.	Marine habitats	Possible / Serious (Medium)		Medium
Noise and vibration from vessels	Increased vessel movements have the potential to increase underwater noise emissions and cause vibrations.	Increased noise and vibration may result in impacts to the marine environment, including megafauna	Marine Megafauna	Unlikely / Minor (Low)	Refer to section 6.9.1	Low
Noise and vibration from reclamation and piling activities	On-site construction plant and equipment (e.g. piling works) may increase noise emissions and cause vibrations.	Increased noise and vibration may result in impacts to the marine environment, including megafauna	Sensitive receptors, in close proximity to Rockwall	Possible / Serious (Medium)	Refer to section 6.9.2	Low
	Noise and vibration generated during construction activities (particularly piling works) may cause disturbance.		Marine Megafauna	Likely / Minor (Medium)		Medium

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Element	Primary Impacting Process	Potential Impact	Risk Receptor	Raw Likelihood / Consequence (risk rating)	Mitigation Measures	Residual Risk
Hazardous materials handling and storage	<p>Incorrect storage and handling of hazardous substances may result in release to surrounding lands/ marine environment.</p> <p>Spills or leakage of fuel/oil and other hazardous materials or dangerous goods may cause soil contamination.</p> <p>Incidents may occur whereby contaminants are accidentally released to surrounding land and/or the marine environment.</p>	<p>Release to waters may affect marine water quality, marine species or the quality of their habitats</p>	<p>Sensitive receptors, in close proximity to Rockwall</p> <p>Marine megafauna</p>	Unlikely / Minor (Low)	Refer to section 6.10	Low
				Unlikely / Minor (Low)		Low
				Likely / Minor (Medium)		Medium
Waste Management	<p>Incorrect handling and storage may introduce wastes into the marine environment.</p> <p>Incorrect handling and storage of waste may encourage pests and provide breeding habitats for mosquitoes.</p>	<p>Release of waste may increase the risk of entanglement and/or ingestion by marine fauna</p>	Marine megafauna	Possible / Minor (Medium)	Refer to section 6.11	Low
				Possible / Minor (Medium)		Low
Cultural Heritage (indigenous/General)	<p>Construction activities have the potential to disturb/ destroy items of cultural significance.</p> <p>Disturbance or loss of significant Traditional Owner cultural heritage values, artefacts or places may occur.</p> <p>Degradation or loss of general cultural heritage items or places may occur.</p>	<p>Disturbance of culturally significant items</p> <p>Loss or diminishing of cultural values</p>	<p>Traditional owners</p> <p>Non-traditional cultural heritage</p>	Unlikely / Serious (Medium)	Refer to section 6.12	Medium
				Possible / Serious (Medium)		Medium
				Rare / Minor (low)		Low
Artificial light	Artificial light from construction activities or port activities may impact.	Artificial light may adversely affect marine and terrestrial fauna, including behavioural change.	<p>Marine megafauna</p> <p>Terrestrial fauna</p>	Likely / Serious (Substantial)	Refer to section 6.13	Medium

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6.2. Uncertainty associated with MEMP success

The CU Project will not be without uncertainties that could influence the ability of POTL to fully implement the MEMP and associated actions. These uncertainties are varied, with the key risks to the achievement of the plan detailed in Table 4. Control measures and risk ratings are also presented. It should be noted that these uncertainties are associated with project management arrangements, whereas the Contingency Plans detailed in Section 9 are focused on activity risks and response plans.

Table 4: Key uncertainties associated with Management of the CU Project.

Element	Impacting Process/ Potential Impact	Risk Receptor	Raw Likelihood / Consequence	Mitigation Measures	Residual Risk
Data uncertainty / Inaccuracy	Failure to anticipate impacting activities due to data or information inaccuracies Environmental impacts occur due to incomplete understanding/ misunderstanding of impact	Sensitive receptors of Cleveland Bay	Likely / Major (High)	POTL will use experienced contractors to design and implement monitoring programs to ensure accuracy and rigorousness. Extensive data collection occurred prior to commencement and externally reviewed through EIS/AEIS Baseline data collected from key monitoring programs prior to commencement for comparison Expert input into ongoing monitoring programs to ensure robustness of data, particularly through ITAC review and involvement and through peer review of monitoring plans.	Substantial (Likely / Serious)
Failure to deliver controls detailed in the plan	Management Controls not delivering mitigation measures Environmental impacts occur due to failure to implement adequate controls. Breach of approval condition	Sensitive Receptors of Cleveland Bay Compliance record /Public Reputation	Possible / Major (Substantial)	POTL will engage experienced contractors to deliver the key construction fronts. POTL will implement a comprehensive monitoring and auditing program to review and confirm compliance with implementation of the controls in the plan Implementation of key monitoring programs of sensitive receptors to monitor for any potential environmental impacts from the project	Medium (unlikely / Serious)

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Element	Impacting Process/ Potential Impact	Risk Receptor	Raw Likelihood / Consequence	Mitigation Measures	Residual Risk
				Annual compliance review against approval conditions and approved documents (Management Plans etc) will be undertaken to demonstrate compliance.	
Project monitoring not delivered	<p>Monitoring programs not implemented due to lack of commitment, funding and resourcing</p> <p>Monitoring program not conducted due to failure to engage contractors or contractor poor performance</p> <p>Environmental impacts occur due to incomplete understanding of impact</p>	<p>Sensitive receptors of Cleveland Bay</p> <p>Consultant responsibilities</p> <p>Compliance & complaints record</p>	Possible / Serious (Medium)	<p>POTL will use experienced contractors to design and implement monitoring programs to ensure accuracy and rigorousness.</p> <p>Baseline data collected from key monitoring programs prior to commencement for comparison.</p> <p>Expert input into ongoing monitoring programs to ensure robustness of data, particularly through ITAC review and involvement and through peer review of monitoring plans.</p> <p>Detailed contract management process for key monitoring programs to ensure delivery of the program and identification of any limitations early.</p> <p>CU Environmental staff (Manager and Advisors) remain across all monitoring programs to ensure continuation of programs in the absence of a staff member.</p>	Medium (unlikely / Serious)
Loss of funding commitment to deliver project	<p>Project ceases part way through delivery, or delivery reduced due to loss of funding.</p> <p>Environmental impacts occur due to incomplete delivery of project and controls.</p> <p>Breach of approval condition</p>	<p>Workforce</p> <p>Sensitive receptors of Cleveland Bay</p> <p>Compliance record / Public reputation</p>	Unlikely / Major (Medium)	<p>Funding arrangements established prior to project commencement, including significant Government funding commitments (both Qld and Commonwealth)</p> <p>Regular reporting to Government to justify funding and demonstrating delivery of the project.</p> <p>POTL commitment to deliver project and will be responsible for any funding shortfall.</p> <p>Annual compliance review against approval conditions and approved documents (management plans etc) will be undertaken to demonstrate compliance</p>	Low (Unlikely / Minor)

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Element	Impacting Process/ Potential Impact	Risk Receptor	Raw Likelihood / Consequence	Mitigation Measures	Residual Risk
Severe / Extreme weather	<p>Severe and extreme weather events result in damage to partially constructed infrastructure, which in turn can impact on MNES and marine environment</p> <p>Severe/extreme weather results in loss of contaminants and sediment to the marine environment</p> <p>Damage to the constructed rockwall can result in release of dredge material to the marine environment.</p> <p>Severe/extreme weather events personally impacting upon POTL /contractors /monitoring consultants and equipment – significantly delaying deliverables</p>	<p>POTL infrastructure</p> <p>Sensitive Receptors of Cleveland Bay</p> <p>POTL employees, POTL contractors, POTL monitoring consultants</p>	Likely / Major (High)	<p>Implement POTL Cyclone Response Plan which establishes clear actions and steps to be taken in the preparation for, response to and recovery from a cyclone event for the Port of Townsville.</p> <p>Key construction activities to be planned to commence and be mostly completed in dry seasons where risk of severe weather is reduced.</p> <p>Reclamation integrity plan incorporates severe weather contingency arrangements to minimise impact.</p> <p>Key construction fronts designed to accommodate and withstand standard severe weather events.</p> <p>POTL will engage experienced contractors to deliver the key construction fronts.</p> <p>POTL’s Cyclone Response Plan enacted to ensure all POTL staff are safe and equipment removed where practical prior to extreme events.</p> <p>CU Environmental staff (Manager and Advisors) remain across all monitoring programs to ensure continuation of programs in the absence of a staff member.</p>	Medium (Possible /Serious)

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6.3. Risk Assessment of Environment Elements

The following section of the MEMP identifies the key environmental threats associated with the activities in the marine environment that have the potential to impact on the key MNES. For each environmental threat, management and mitigation measures to address the issue are documented along with overall associated performance objectives, performance criteria, monitoring, reporting, corrective actions and emergency response measures Table 5.

Table 5: MEMP Element Assessment Structure

Component	Description of Content
Element	The environmental issue at the site requiring management consideration, response strategies and actions during construction activities.
Objective	The guiding performance objective that applies to the element.
Risk level	The assessed level of residual risk posed from the CU Project on the Element (based on EIS/AEIS assessment)
Aspects & Impacts	The construction activities and potential environmental impacts that apply to the element.
Mitigation Measures	The mechanisms and management actions through which the objective will be achieved.
Performance Criteria	The measurable performance criteria (outcomes/indicators) by which the success of the achievement of the objective will be determined.
Monitoring / Auditing	The process of measuring actual performance, or how well the objective has been achieved, including the format, timing and responsibility for auditing of the monitoring results.
Reporting	The format, timing and responsibility for reporting of monitoring and audit results.
Corrective Actions	The actions to be implemented in the case where a performance criterion is not met.
Responsibility	The site personnel involved in the various tasks required for each element.

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6.4. Land and Reclamation footprint

6.4.1. Minimise Impacts from Land Contamination

This section is related to CEMP (POT 2099) Section 5.4 – Land. All works are to meet the criteria of both the CEMP and MEMP.

Element	Minimise impacts from Land Contamination
Residual Risk level	Objective
MEDIUM	To avoid environmental harm as a result of reclamation activities from instability of rock walls, Potential Acid Sulphate Soils (PASS) and contaminated Soil.
Activities	
<ul style="list-style-type: none"> – Collapses or failures of the structural integrity of the rock walls may release dredge material and cause adverse impacts in the marine environment (Section 6.5). – Disturbed capital dredge material or excavated PASS material or imported soil/fill placed in the reclamation area may cause potential land contamination that leaches into Cleveland Bay. – Spills or leakage of fuel/oil and other hazardous materials or dangerous goods may cause soil contamination (Section 6.10) and release of contaminants to the marine environment. 	

Performance Criteria / Indicators

- All works are managed in accordance with the relevant management plan (CEMP POT 2099), the applicable Commonwealth and State legislation and standards and any other relevant approvals, standards, guidelines (NAGD, NEPM, Queensland Acid Sulfate Soil Technical Manual) and statutory requirements.
- PASS and contamination management procedures are implemented.
- Tailwater monitoring results are within trigger levels.
- All rock or fill material from external sources brought into site will meet design specifications and relevant environmental standards.
- No complaints are received from regulators or the community in relation to water quality impacts from the reclamation and/or impacts on megafauna.

Mitigation	Responsibility
– Undertake an analysis of the sediment to be dredged in capital dredge areas (against the NAGD standards), before commencement of dredging, to determine contamination status/management requirements including the Holocene soils to confirm PASS status/management requirements (to meet Performance Criteria A).	Manager Environment CU
– Keep dredge material wet and saturated during transport to reclamation area to ensure compliance with holding times outlined in the Queensland Acid Sulfate Soil (ASS) Technical Manual (to meet Performance Criteria A and B).	Contractor
– Place dredge material carefully to limit the extent of heaving and formation of mud waves from the existing soft soil seabed (typically <1.5 m thick) to below the mid-water level using confining pressure and encapsulation (to meet Performance Criteria A and E).	Contractor
– Implement and maintain a relevant Acid Sulfate Soil and Contamination Management Plan (POT 2100) for management and monitoring of the rock wall construction and reclamation to inform CU Project personnel of the risks and management requirements for PASS (to meet Performance Criteria A to E).	Project Engineer CU/ Contractor/ Environmental Advisor CU

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Element	Minimise impacts from Land Contamination	
	- Implement the Tailwater Management Plan (POT 2101) including appropriate trigger levels and protocols for settling pond(s) within the reclamation area and release of tailwater (to meet Performance Criteria C).	Project Director CU
	- Implement the Reclamation Integrity Monitoring Plan for monitoring the integrity of rock walls (to meet Performance Criteria A and D).	Project Director CU
	- Reclamation ponds to be lined with geofabric prior to deposition of dredge material to contain materials and potential contaminants (to meet Performance Criteria A).	Project Engineer CU
Training (to meet Performance Criteria A to E)		
	- Ensure that the appropriate site personnel undertake environmental awareness and training covering the requirements for PASS and contaminated soil management.	Manager Environment CU

Monitoring / Auditing

- Tailwater monitoring conducted as per Tailwater Management Plan (POT 2101).
- Monitoring conducted as per the Acid Sulphate Soil and Contamination Management Plan (POT 2100).
- Conduct monitoring in accordance with the Reclamation Integrity Plan.
- Undertake regular sites inspections to monitor land contamination to determine the effectiveness of mitigation measures.

Responsibility

- Environmental Advisor CU/
- Environmental Advisor CU
- Project Engineer CU
- Environmental Advisor CU

Corrective Actions

Where Performance Criteria A to E are not met at any point throughout construction and reclamation, the following corrective actions must be undertaken:

- Manage any material impacted by spills and/or contamination through:
 - Prompt clean-up of any spills;
 - Investigation and sampling; and
 - Excavation and disposal of contaminated material at a suitable disposal facility by a licensed waste disposal contractor as required.
- Undertake a review of reclamation management practices if pH and/or dissolved oxygen drops in tailwater within the reclamation area.
- Review reclamation management practices if adverse impacts are observed.
- Treat any PASS impacted areas in accordance with the mitigation actions outlined in the Acid Sulphate Soil and Contamination Management Plan (POT 2100).
- Manager Environment CU / Environmental Advisor CU Investigate all incidents in relation to identified land contamination within 5 business days, including reporting to the appropriate regulator.
- Manager Environment CU will respond to all complaints in relation to land contamination within 2 business days.
- Undertake a review of both the MEMP and CEMP and associated plans to determine if further controls or mitigation measures are needed where investigations show unacceptable impacts from land contamination issues.
- Implement any other corrective actions as directed by regulators.

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Element **Minimise impacts from Land Contamination**

Reporting

- The Contractor will maintain a site activity log, recording the type of activities occurring during various times of the day to assist with the retrospective investigation of any incidents / complaints / land contamination issues.
- All CU Project personnel will inform the Manager Environment CU and Project Engineer CU as soon as possible in the event of a significant land contamination or PASS control issue. The Manager Environment CU will report to the GM I&E with any additional investigation(s) undertaken as required.
- Reporting of tailwater monitoring and management as established in the Tailwater Management Plan.
- The Manager Environment CU will report to DAWE (or successor agency) any exceedance of the MNES performance criteria and early warning trigger levels, including any implementation of MNES risk management, adaptive management strategies, corrective actions and emergency response measures implemented, within 21 days of the initial incident/exceedance notification.

Adaptive management program

- The Manager Environment CU will ensure new data/information is collected and incorporated into this plan/CEMP, as a result of implementing this plan and new information from external sources (e.g. academic literature, EPBC policy statements);
- The Environmental Advisor CU will effectively coordinate, schedule and/or trigger monitoring, risk management, auditing and reporting activities in association with the CEMP Land aspects;
- The Manager Environment CU will periodically (min 6 monthly) review risks associated with land contamination from construction activities and reclamation integrity, including in response to the risk level, changing circumstances or the results from implementing contingency response/corrective actions;
- The Manager Environment CU will periodically (min 6 monthly) review the effectiveness of management measures with relatively long implementation timeframes, significant levels of uncertainty and upon which the plan is highly dependent;
- The Manager Environment CU will implement corrective actions and amended mitigation measures should the monitoring programs specified in this element demonstrate a risk to the environment or MNES.
- The Manager Environment CU will address the consequences of significant environmental incidents (planned and unanticipated); and
- The Manager Environment CU will review the plan under the following circumstances:
 - performance reports indicate performance targets/indicators may not be achieved;
 - according to approved timeframes; or the impacts of significant environmental incidents.

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6.4.2. Minimise Impacts from Reclamation footprint

Element		Minimise the impact of the Reclamation footprint
Residual Risk level	Objective	
LOW	To minimise the impact of the Reclamation footprint on MNES, particularly marine megafauna.	
Activities		
<ul style="list-style-type: none"> – The construction of the land reclamation removes, or fragments habitat used by megafauna in Cleveland Bay – Seagrass meadows in the reclamation footprint are destroyed removing habitat for megafauna. – Removal of habitat may result in long term disturbance or behavioural change to marine megafauna. 		

Performance Criteria / Indicators

- All reclamation works are kept within the boundary of the approved area.
- Any seagrass meadows in the reclamation footprint surveyed and quantified (via the Seagrass Footprint Survey, 2018).
- If seagrass meadows are found in the reclamation footprint, they are offset to the satisfaction of the regulators.
- No long-term distributional or behavioural impacts to inshore dolphins from rockwall construction activities, as measured/determined through the Inshore Dolphin Monitoring Plan (POT 2154, Appendix F).

Mitigation	Responsibility
– Reclamation footprint restricted to location and size as per EPBC Act approval 2011-5979, as shown in Figure 2 (to meet Performance Criteria A).	Manager Environment CU
– If seagrass meadows are found within the reclamation footprint, they will be subject to project offset requirements (to meet Performance Criteria B and C).	Manager Environment CU
– If residual impacts to inshore dolphins arise from works associated with rock wall construction, they will be subject to project offset requirements (to meet Performance Criteria D).	Manager Environment CU
– Review the results of each monitoring survey to capture any potentially negative trends forming in behavioural patterns associated with the construction works (to meet Performance Criteria D).	Environmental Advisor CU

Monitoring / Auditing

- | | Responsibility |
|---|------------------------|
| – Undertake a survey of the reclamation area before the commencement of rockwall construction to determine the presence and density of seagrass within the reclamation footprint (as per EPBC Act Approval Condition 9). Completed in 2018. | Manager Environment CU |
| – Reclamation works will be spatially/cadastral surveyed to ensure works remain within the approved reclamation footprint (under the Reclamation Integrity Plan within the CEMP POT 2099). | Project Engineer CU |
| – Reclamation works will be subject to RPEQ certified ‘for construction drawings’ and ‘as constructed drawings’ demonstrating the exact location of the reclamation. | Project Engineer CU |

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Element **Minimise the impact of the Reclamation footprint**

- Conduct monitoring in accordance with Inshore Dolphin Monitoring Plans (POT 2154) (Appendix F) to determine if any rock wall construction related long term impacts, occur on inshore dolphin distribution and behaviour within Cleveland Bay. Manager Environment CU

Corrective Actions

Where Performance Criteria A to D are not met at any point throughout construction and reclamation, the following corrective actions must be undertaken:

- Where performance criteria are exceeded, formal investigation of the exceedance is to commence by Environmental Advisor CU/ Manager Environment CU within 5 business days of identification of exceedance, including reporting to the appropriate regulator.
- Project Director CU / Project Engineer CU to investigate any incidents where material is found to be placed outside of the approved footprint.

Rock associated with the revetment wall found to be outside of the approved alignment to be removed unless otherwise agreed.

Reporting

- The Contractor will maintain a site activity log, recording the type of activities occurring during various times of the day to assist with the retrospective investigation of any incidents / complaints.
- The Project Engineer CU will ensure regular spatial surveys of the reclamation construction are undertaken to ensure it remains within the identified alignment.

The Manager Environment CU will report to DAWE (or successor agency) any exceedance of the MNES performance criteria and early warning trigger levels, including any implementation of MNES risk management, adaptive management strategies, corrective actions and emergency response measures implemented, within 21 days of the initial incident/exceedance notification.

Adaptive management program

- The Manager Environment CU will ensure new data/information is collected and incorporated into this plan/CEMP, as a result of implementing this plan and new information from external sources (e.g. academic literature, EPBC policy statements);
- The Environmental Advisor CU will effectively coordinate, schedule and/or trigger monitoring, risk management, auditing and reporting activities in association with the rockwall footprint aspects;
- The Manager Environment CU will periodically (min 6 monthly) review risks associated with rockwall footprint, including in response to the risk level, changing circumstances or the results from implementing contingency response/corrective actions;
- The Manager Environment CU will implement corrective actions and amended mitigation measures should the monitoring programs specified in this element demonstrate a risk to the environment or MNES.
- The Manager Environment CU will address the consequences of significant environmental incidents (planned and unanticipated); and
- The Manager Environment CU will review the plan under the following circumstances:
 - performance reports indicate performance targets/indicators may not be achieved;
 - according to approved timeframes; or the impacts of significant environmental incidents.

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6.5. Water Quality (Stormwater & Tailwater)

Related to CEMP Section 5.5 – Marine Water and Sediment

Element	Water Quality (Stormwater & Tailwater)
Residual Risk level	Objectives
MEDIUM	<ul style="list-style-type: none"> – To avoid or minimise turbidity impacts to MNES in the marine environment from construction activities (of the rock wall), or stormwater releases (outside) the construction footprint. – To avoid MNES in the marine environment from being contaminated by construction activities. – To implement effective sediment and erosion control measures which avoid sediments generated by construction activities causing a hazard or nuisance to MNES in the marine environment. – To ensure the release of tailwater (discharge waters from the reclamation area) to the environment is of an acceptable standard.

Activities

- Earthworks activities will expose soil that may increase erosion leading to increased suspended sediment concentration in stormwater runoff.
- Rock stockpiling activities and truck haulage may increase the suspended sediment concentration in stormwater.
- Exposure and potential release of sediments and contaminants from construction activities and stormwater to marine water and marine sediments may have adverse direct or indirect impacts on marine life.
- The capital dredge material will be hydraulically placed into the reclamation area, with tailwater moving through the site to an ultimate tailwater outlet weir box into Cleveland Bay (adjacent to the Ross River).
- The release of tailwater has the potential to adversely impact on the adjacent marine water and sediment quality.
- Rain events / wet season can lead to sediment-laden stormwater entering the marine environment, which may impact upon the localised water quality.

Performance Criteria / Indicators

- A. All works are managed in accordance with the relevant management plans (including project CEMP POT 2099, Stormwater, Sediment and Erosion Control Plan POT 2137, Tailwater Management Plan POT 2101, and Acid Sulfate Soil Contamination Management Plan POT 2100)), the *Soil Erosion and Sediment Control – Engineering Guidelines for Queensland Construction Sites* (The Institution of Engineers, Australia (Qld), the *Environmental Protection (Water) Policy 2009*, best earthworks practice and any other relevant approvals, standards, guidelines and statutory requirements (such as IECA 2008).
- B. No exceedance of surface water release limits stipulated in the Qld State Government Approval, or limits set out in the CU Site Monitoring Plan (POT 2103) or CU Tailwater Management Plan (POT 2101).
- C. No impact to water quality in the receiving environment as a result of contaminated stormwater, ineffective sediment and erosion control, or through tailwater releases as identified through the site monitoring plan (POT 2103) and tailwater management plan (POT 2101).
- D. No failure of sediment and erosion controls (i.e. controls are maintained and fit for purpose) in normal wet season conditions/events.
- E. No complaints are received from regulators or the community in relation to stormwater management or sediment and erosion control issues.

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Element	Water Quality (Stormwater & Tailwater)	
Mitigation		Responsibility
<ul style="list-style-type: none"> – Implement the site specific sediment and erosion control as detailed in the Stormwater, Sediment and Erosion Control Plan (POT 2137), in accordance with the International Erosion Control Association’s “Best Practice Erosion and Sediment Control” guidelines (to meet Performance Criteria A.). 		Project Engineer CU/ Environmental Advisor CU
<ul style="list-style-type: none"> – Cease operation of the construction site and move equipment to a safe location in the event of extreme weather conditions (e.g. cyclone) (to meet Performance Criteria A, B, C and E). 		Contractor
<ul style="list-style-type: none"> – Manage ASS and PASS in accordance with the Acid Sulfate Soil and Contamination Management Plan (POT 2100) (to meet Performance Criteria A and B). 		Project Engineer CU / Contractor
<ul style="list-style-type: none"> – Control potential piping of sediment fines through the wall from the reclamation area with appropriate site management, and tailwater controls (i.e. tailwater prevented from entering the sea by use of rock geotextile fabric filter layer on bund walls or other control measures) (to meet Performance Criteria A to E). 		Project Engineer CU / Contractor
<ul style="list-style-type: none"> – Make available sufficient materials to enable required geotechnical controls to be implemented, before commencing capital dredging related activities (to meet Performance Criteria A, B and C). 		Project Director CU
<ul style="list-style-type: none"> – Implement the CU Site Monitoring Plan (POT2103) to provide routine and event based monitoring to predict potential water quality issues (to meet Performance Criteria B). 		Environmental Advisor CU
<ul style="list-style-type: none"> – Direct and control all tailwater releases through a height adjustable tailwater outlet weir box (to meet Performance Criteria A to E). 		Contractor
<ul style="list-style-type: none"> – Implement the Tailwater Management Plan (POT2101) (to meet Performance Criteria A to D), comprising: <ul style="list-style-type: none"> • Turbidity/Total Suspended Solids (TSS)/pH/metals sampling at the tailwater outlet; • Appropriate triggers and protocols e.g. monitor water quality of standing water within the reclamation area prior to a controlled release; and • Plume validation monitoring of turbidity/TSS in receiving waters adjacent to the tailwater outlet. 		Manager Environment CU / Environmental Advisor CU
<ul style="list-style-type: none"> – Review the on-site control measures promptly, if turbidity/TSS in the tailwater exceeds the performance criteria, to ensure that all reasonable and practicable measures are being taken in terms of both settling pond operations and the hydrologic and sediment loading in the settling pond(s) (to meet Performance Criteria A to E). 		Environmental Advisor CU Project Engineer CU / Contractor
Training (to meet Performance Criteria A to E)		
<ul style="list-style-type: none"> – Ensure that the appropriate CU Project personnel undertake environmental awareness and training covering the requirements regarding stormwater management and sediment and erosion control and tailwater management. 		Manager Environment CU

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Element Water Quality (Stormwater & Tailwater)

Monitoring / Auditing	Responsibility
– Conduct monitoring and observation of weather conditions and alerts relevant to the site, including extreme weather events.	Project Engineer CU
– Conduct monitoring in accordance with the CU Site Monitoring Plan, including review of any results against the standards stated in the plan.	Environmental Advisor CU
– Conduct tailwater monitoring in accordance with the Tailwater Management Plan and analyse the results in comparison to the Qld Government approval conditions.	Environmental Advisor CU
– Conduct monitoring of the spatial extent of the mixing zone during tailwater release events.	Environmental Advisor CU
– Conduct tailwater plume validation monitoring and analyse the results to verify modelling results.	Environmental Advisor CU
– Undertake regular site inspections to check for damage to sediment and erosion controls and the effectiveness of sediment and erosion control measures in accordance with the CU Stormwater & Sediment Erosion Control Plan.	Environmental Advisor CU
– Undertake regular inspections of stormwater run-off areas to check for cleanliness and potential for contaminants to impact on water quality and effectiveness of stormwater and sediment and erosion control measures, particularly after significant rainfall events.	Environmental Advisor CU
– Conduct visual observations of the settling ponds to check for scum formations, oil spills etc.	Environmental Advisor CU
– Undertake regular site inspections to check for damage to reclamation area and the effectiveness of geofabric control measures on the bund walls.	Environmental Advisor CU
– Undertake regular inspections of the site to check for effectiveness of tailwater control measures, particularly after significant rainfall events.	Environmental Advisor CU

Corrective Actions

Where Performance Criteria A to E are not met at any point throughout construction and reclamation, the following corrective actions must be undertaken:

- Where stormwater controls are observed to be ineffective, or site monitoring results in exceedance of water quality guidelines, sediment and erosion control structures/procedures are to be fixed within 5 business days (where safe to do so). This will include: re-instating silt fences and bunds, compaction and covering of loose/unconsolidated material, adding to the height adjustable tailwater weir box to limit releases.
- The Environmental Advisor CU/Manager Environment CU will investigate all incidents in relating to stormwater, sediment and erosion control, or tailwater management issues within 5 business days of an exceedance, including reporting to the appropriate regulator.
- The Environmental Advisor CU/Manager Environment CU will respond to all complaints in relation to stormwater, sediment and erosion control, or tailwater management issues within 2 business days and rectify legitimate problems, as required.
- Undertake a review of the MEMP, CEMP and associated plans, to determine if further controls or mitigation measures are needed where investigations show unacceptable impacts from stormwater quality, failure of sediment and erosion controls, or tailwater management.

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Element	Water Quality (Stormwater & Tailwater)
	<ul style="list-style-type: none"> - Specific to Performance Criteria B - Implement the following corrective actions if continual turbidity/TSS exceedances are observed: <ul style="list-style-type: none"> • Increase tailwater residence time in the tailwater ponds; • Redirect tailwater through the settling pond(s) to allow further settlement before being released, installing additional internal bund walls if required; • Modify decanting rates via the tailwater outlet weir box and ensure hydraulic efficiency; and/or • Install additional controls in the settling pond(s) or other controls that can regulate wind and wave action in the settling pond(s). - Specific to Performance Criteria C - Implement the following corrective actions if the tailwater pH is outside of the specified range: <ul style="list-style-type: none"> • Add lime or other mechanism to increase pH and monitor pH during dosing to limit risk of over dosing; and/or • Review implementation of ASS/PASS treatment measures to ensure effectiveness. - Implement any other corrective actions as directed by regulators.

Reporting

- The Contractor will maintain a site activity log, recording the type of activities occurring during various times of the day to assist with retrospective investigation of incidents / complaints.
- All CU Project personnel will inform the Manager Environment CU and Project Director CU as soon as possible in the event of a stormwater or sediment and erosion control issue, tailwater discharge issue, an uncontrolled stormwater release and/or uncontained spill. The Manager Environment CU will report to the GM I&E, with any additional investigation(s) undertaken as required.
- The Environmental Advisor CU will maintain monitoring results in a database within one week of each monitoring event. On completion of the CU Project, the database will be stored in accordance with legal record retention requirements.
- The Environmental Advisor CU will develop a report within 40 Business days of commencing tailwater releases to identify and describe any adverse impacts to receiving water environmental values (including suitability of tailwater release limits) due to authorised tailwater releases.
- The Environmental Advisor CU will report tailwater performance regularly to relevant committees.
- The Environmental Advisor CU will prepare an annual report which will identify any exceedances of performance criteria, any significant changes to the quality of tailwater release and any corrective actions taken or to be implemented. The surveillance report will be submitted to POTL senior management and to regulators.
- The Environmental Advisor CU will prepare a final monitoring report at the end of the CU Project.
- The Manager Environment CU will report to DAWE (or successor agency) any exceedance of the MNES performance criteria and early warning trigger levels, including any implementation of MNES risk management, adaptive management strategies, corrective actions and emergency response measures implemented, within 21 days of the initial incident/exceedance notification.

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Element	Water Quality (Stormwater & Tailwater)
Adaptive management program	
<ul style="list-style-type: none"> - The Manager Environment CU will ensure new data/information is collected and incorporated into this plan/CEMP, as a result of implementing this plan and new information from external sources (e.g. academic literature, EPBC policy statements); - The Environmental Advisor CU will effectively coordinate, schedule and/or trigger monitoring, risk management, auditing and reporting activities in association with stormwater, sediment and erosion control; - The Manager Environment CU will periodically (min 6 monthly) review risks associated with stormwater contamination and sediment and erosion control, including in response to the risk level, changing circumstances or the results from implementing contingency response/corrective actions; - The Manager Environment CU will periodically (min 6 monthly) review the effectiveness of management measures with relatively long implementation timeframes, significant levels of uncertainty and upon which the plan is highly dependent; - The Manager Environment CU will implement corrective actions and amended mitigation measures should the monitoring programs specified in this element demonstrate a risk to the environment or MNES. - The Manager Environment CU will address the consequences of significant environmental incidents (planned and unanticipated); and - The Manager Environment CU will review the plan under the following circumstances: <ul style="list-style-type: none"> • performance reports indicate performance targets/indicators may not be achieved; • according to approved timeframes; or the impacts of significant environmental incidents. 	

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6.6. Vessel /Equipment strike and accidents

Related to CEMP Section 5.6 and 5.7 – Marine and Terrestrial Ecology

6.6.1. Vessel strike and Accidents

Element	Vessel strike and accidents
Residual Risk level	Objectives
MEDIUM	<ul style="list-style-type: none"> - To avoid impacts from project related vessels, including vessel strike and accidents - To avoid the risk of disturbance or injury to marine megafauna resulting from project related vessels associated with the rockwall construction, including vessel strikes and accidents. - To establish and maintain awareness of the importance of protecting marine megafauna
Activities	
<ul style="list-style-type: none"> - Interactions between project related vessels and marine megafauna may result in disturbance or injury to marine megafauna. - Vessel strikes to marine fauna may result in injury or death of individuals. 	

Performance Criteria / Indicators

- A. No injury or loss of marine megafauna because of project vessel operations.
- B. Small vessel masters and crew to complete training in marine megafauna observation and response procedures.
- C. All works are managed in accordance with the relevant management plans (MEMP), the Nature Conservation Act 1992 and any other relevant approvals, standard, guidelines and statutory requirements, including no movement of vessels within required distances of megafauna.
- D. No complaints are received from regulators or the community in relation to marine megafauna issues.

Mitigation	Responsibility
<ul style="list-style-type: none"> - Ensure suitably trained Marine Fauna Observers for the construction activities where required (i.e. main work fronts) to identify where megafauna are within set distances during vessel operations (to meet Performance Criteria A and B). 	Manager Environment CU
<ul style="list-style-type: none"> - Ensure small vessel masters and crew are trained in marine megafauna observation and mitigation techniques (to meet Performance Criteria B and C). 	Contractors
<ul style="list-style-type: none"> - Maintain active awareness of marine megafauna throughout daily construction activities, including within the exclusion zone (to meet Performance Criteria A to D). 	Contractors / Marine Megafauna Observer
<ul style="list-style-type: none"> - Adopt marine megafauna (marine mammal and turtle) observation and response procedures (to meet Performance Criteria A to D), including: <ul style="list-style-type: none"> o Maintaining a lookout for cetaceans and turtles while small vessels are operating; o Adjusting vessel speed and direction, within the safety constraints of the vessel, to avoid impact on the observed individuals in the event that megafauna is sighted, including remaining greater than 150m from dolphins, turtles and dugongs, and 300m from whales. 	Contractors / Project Engineer CU
<ul style="list-style-type: none"> - Enforce vessel speed limits where appropriate (i.e. less than 6 knots in waters less than 2.5m depth or within 50m of shoreline) to reduce potential for marine megafauna collision (to meet Performance Criteria A). 	Contractors / Project Engineer CU

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Element	Vessel strike and accidents	
	Noting that this may be exceeded during emergencies or for vessels requiring higher speed to maintain navigational safety.	
	– Limit vessel usage near sensitive habitat areas to prevent disturbance to sensitive receptors (to meet Performance Criteria A and C).	Project Engineer CU
Training (to meet Performance Criteria A to D)		
	– Ensure that the appropriate vessel crews undertake environmental awareness and training covering the requirements of the MEMP regarding marine megafauna/ecology.	Manager Environment CU
	– Provide appropriate training and information to all vessel crew on marine megafauna management requirements during induction.	Contractor

Monitoring / Auditing

Responsibility

- | | |
|--|--------------------------|
| – Conduct monitoring in accordance with Inshore Dolphin and Marine Megafauna Monitoring Plans (POT 2154 Appendix F, POT 2155 Appendix G) before, during and after completion of the project, to the results in comparison to the performance criteria and approval conditions. | Environmental Advisor CU |
| – Conduct observations for marine megafauna by vessel masters and crew during vessel operations on each vessel, including maintaining a log of when megafauna is sighted, and action is taken to avoid interaction. | Contractors |
| – Review marine stranding’s data to identify any death or injury to megafauna that could be attributed to CU construction activities. | Manager Environment CU |
| – Undertake regular site and vessel inspections to monitor for issues that may adversely impact on marine megafauna. | Environmental Advisor CU |

Corrective Actions

Where Performance Criteria A to D are not met at any point throughout construction and reclamation, the following corrective actions must be undertaken:

- Implement emergency response measures as per vessel SMS in the event of a marine megafauna injury or incident; and:
 - Liaise with DES or other relevant body (i.e. GBRMPA) immediately to identify rescue options and develop future corrective actions if injury to marine megafauna occurs.
 - Assist in capture of injured animals following advice from regulators.
- The Manager Environment CU will commence an investigation into incidents relating to marine megafauna vessel strikes and accidents within 24 hours, including reporting to the appropriator regulator.
- Implement revised control measures (modified observation process and/or further exclusion zones) immediately where performance criteria are not met, or marine megafauna issues are identified or have the potential to occur in the future.
- The Environmental Advisor CU/Manager Environment CU will respond to all complaints in relation to marine megafauna within 2 business days and rectify legitimate problems as required.
- Any impacts identified via the marine fauna and inshore dolphins monitoring plans as a result of construction activities will be reported via the specific monitoring plans and inform reviews of the relevant management plans.
- Undertake a review of the MEMP and associated plans, to determine if further controls or mitigation measures are needed where investigations show unacceptable impacts to marine megafauna.
- Implement any other corrective actions and mitigation measures as directed by the appropriate regulator.

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Element **Vessel strike and accidents**

Reporting

- Small vessel masters will maintain a site activity log, recording the type of activities occurring during various times of the day to assist with the retrospective investigation of any incidents / complaints.
- All vessel crew will inform the Master as soon as possible in the event of a significant marine megafauna disturbance issue, or vessel strike/accident and the Master will investigate and report to the Project Director CU.
- Small vessel masters will maintain a record of sighted animals indicating the sighting of each individual animal and actions taken.
- Record and report immediately any incident involving marine megafauna interactions (marine animal strike, marine stranding or an injured, sick or dead turtle, dugong, dolphin or whale) will be reported to the Qld DES (on 1300 130 372).
- Compile an incident report of all the details of any incident involving marine megafauna.
- The Manager Environment CU will report to DAWE (or successor agency) any exceedance of the MNES performance criteria and early warning trigger levels, including any implementation of MNES risk management, adaptive management strategies, corrective actions and emergency response measures implemented, within 21 days of the initial incident/exceedance notification.

Maintain records of all inductions and training undertaken by small vessel Masters, crews and fauna observers that included relevant marine megafauna management requirements.

Adaptive management program

- The Manager Environment CU will ensure new data/information is collected and incorporated into this plan/CEMP, as a result of implementing this plan and new information from external sources (e.g. academic literature, EPBC policy statements);
- The Environmental Advisor CU will effectively coordinate, schedule and/or trigger monitoring, risk management, auditing and reporting activities in association with marine ecology and MNES;
- The Manager Environment CU will periodically (min 6 monthly) review risks associated with vessel usage and marine MNES, including in response to the risk level, changing circumstances or the results from implementing contingency response/corrective actions;
- The Manager Environment CU will periodically (min 6 monthly) review the effectiveness of management measures with relatively long implementation timeframes, significant levels of uncertainty and upon which the plan is highly dependent;
- The Manager Environment CU will implement corrective actions and amended mitigation measures should the monitoring programs specified in this element demonstrate a risk to the environment or MNES.
- The Manager Environment CU will address the consequences of significant environmental incidents (planned and unanticipated); and
- The Manager Environment CU will review the plan under the following circumstances:
 - o performance reports indicate performance targets/indicators may not be achieved;
 - o according to approved timeframes; or the impacts of significant environmental incidents.

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6.6.2. Rockwall construction impact or strike

Element	Rockwall construction impact or strike
Residual Risk level	Objectives
MEDIUM	<ul style="list-style-type: none"> - To avoid Impacts from rock wall construction involving animal strike and accidents - To avoid the risk of disturbance or injury to marine megafauna resulting from the rockwall construction activities involving animal strike and accidents. - To avoid adverse direct and indirect impacts on MNES, particularly marine megafauna from rock wall construction activities. - To manage risks associated with extreme weather events on MNES during rock wall construction; - To establish and maintain awareness of the importance of protecting marine megafauna.
Activities	
<ul style="list-style-type: none"> - Interactions between placement of rockwall material and marine megafauna may result in disturbance or injury to marine megafauna. - Equipment strikes during rockwall construction to marine megafauna may result in injury or death of individuals. - Underwater noise emissions and vibration may lead to behavioural disturbance in marine megafauna or marine megafauna temporarily avoiding affected area - Rock wall construction works cease mid construction due to extreme weather events, leaving (submerged) core rock exposed or unprotected - which may lead to rock movement during extreme events 	

Performance Criteria / Indicators

- A. No injury or loss of marine megafauna because of rock wall construction activities.
- B. No significant long-term behavioural impacts to marine megafauna from rockwall construction activities as measured/determined through the Inshore Dolphin and Megafauna Monitoring Plans (POT 2154 Appendix F, POT 2155 Appendix G).
- C. All CU Project personnel to complete an induction that includes marine megafauna management requirements.
- D. All works are managed in accordance with the relevant management plans (including POT 2099 Construction Environmental Management Plan), the Nature Conservation Act 1992 and any other relevant approvals, standard, guidelines and statutory requirements.
- E. No complaints received from regulators or the community in relation to marine megafauna issues.
- F. Project scheduling to include adaptive management for the North Queensland wet season; and the potential for extreme weather events occurring during the construction timeline.

Mitigation	Responsibility
<ul style="list-style-type: none"> - Ensure suitably trained Marine Fauna Observers for key construction activities (including piling, rock wall placement) (to meet Performance Criteria A and C). 	Manager Environment CU
<ul style="list-style-type: none"> - Implement marine megafauna (marine mammal and turtle) observation and response procedures (to meet Performance Criteria A and C), including: <ul style="list-style-type: none"> • Conducting checks for marine megafauna in the immediate vicinity of the rock wall construction, directly before rock is placed in the water 	Contractors / Project Engineer CU / Environmental Advisor CU

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Marine Environmental Management Plan

<ul style="list-style-type: none"> • Applying a 150 m observation and exclusion zone during rockwall construction activities. • Stopping rockwall construction/rock placement when marine megafauna are observed within 150 m of the work front; until the animals have moved further than 150 m or have not been sighted for 30 minutes. • Maintaining a trained marine fauna observer for marine megafauna during rock wall construction activities. 	
<ul style="list-style-type: none"> - Monitor the rock wall/revetment area during lead up to, and enclosure of rockwall areas to identify if any marine megafauna are in danger of, or are, entrapped. Implement a protocol to remove individuals safely if entrapment occurs (to meet Performance Criteria A). 	Contractors / Environmental Advisor CU
<ul style="list-style-type: none"> - Review the results of each monitoring survey conducted under the Inshore Dolphin and Megafauna Monitoring Plans to capture any potentially negative trends forming in behavioural patterns associated with the construction works (to meet Performance Criteria B). 	Environmental Advisor CU
<ul style="list-style-type: none"> - Create contingency planning into the Work Schedule to minimise the potential time the core rock is exposed (i.e. not covered by armour rock) during the North Queensland Wet season (to meet Performance Criteria F). 	Project Director CU
<ul style="list-style-type: none"> - Ensure the CEMP has been also implemented on site (to meet Performance Criteria D). 	Manager environment CU / Project Engineer CU
Training (to meet Performance Criteria A to F)	
<ul style="list-style-type: none"> - Ensure that the appropriate CU Project personnel undertake environmental awareness and training covering the requirements of the CEMP/MEMP regarding marine megafauna/ecology. 	Manager Environment CU
<ul style="list-style-type: none"> - Provide appropriate training to construction personnel responsible for marine megafauna spotting prior to undertaking rock wall construction activities. 	Manager Environment CU
<ul style="list-style-type: none"> - Provide appropriate information to all CU Project personnel on marine megafauna management requirements during induction. 	Manager Environment CU

Monitoring / Auditing

Responsibility

<ul style="list-style-type: none"> - Conduct monitoring in accordance with Inshore Dolphin and Marine Megafauna Monitoring Plans (POT 2154 Appendix F, POT 2155 Appendix G) before, during, and after completion of the project, to determine if any project related impacts occur on megafauna diversity, distribution and behaviour. 	Environmental Advisor CU
<ul style="list-style-type: none"> - Conduct observations for marine megafauna prior to commencing, and during, key construction activities and cease works if marine megafauna enter exclusion zones. 	All CU contractors / Marine Megafauna Observer/ Environmental Advisor CU / Project Director / Manager Environment CU
<ul style="list-style-type: none"> - Undertake checks of compliance with the CEMP/MEMP by the Contractors. 	Environmental Advisor CU
<ul style="list-style-type: none"> - Undertake regular site and equipment inspections to monitor for issues that may adversely impact on MNES or marine megafauna. 	Environmental Advisor CU

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Corrective Actions

Where Performance Criteria A to F are not met at any point throughout construction and reclamation, the following corrective actions must be undertaken:

- Implement emergency and response measures in the event of a marine megafauna injury or incident; and:
 - o Liaise with DES or other relevant body (i.e. GBRMPA) immediately to identify rescue options and develop future corrective actions if injury to marine megafauna occurs.
 - o Assist in capture of injured animals following advice from regulators.
- The Manager Environment CU will commence an investigation into incidents (as per section 4.9) relating to marine megafauna injury/incidents within 24 hours of initial notification, including reporting to the appropriate regulator (within 48 hours)..
- Implement revised control measures (modified observation process and/or further exclusion zones) immediately where performance criteria are not met or marine megafauna issues are identified or have the potential to occur in the future
- The Environmental Advisor CU/Manager Environment CU respond to all complaints (as per section 4.17) in relation to MNES/marine megafauna within two business days and rectify legitimate problems.
- Any impacts identified via the marine megafauna and inshore dolphins monitoring plans as a result of construction activities will be reported via the specific monitoring plans and inform reviews of the relevant management plans.
- Undertake a review of the MEMP and associated plans, to determine if further controls or mitigation measures are needed where investigations show unacceptable impacts to marine megafauna.
- Implement any other corrective actions and mitigation measures as directed by the appropriate regulator.

Reporting

- The Contractor will maintain a site activity log, recording the type of activities occurring during various times of the day to assist with the retrospective investigation of any incidents / complaints.
- All CU Project Personnel will inform the Manager Environment CU and Project Director CU as soon as possible in the event of a significant marine megafauna disturbance issue. The Manager Environment CU will investigate and report to the GM I&E.
- Maintain a record of sighted animals indicating the sighting of each individual animal and actions taken.
- Report down-time due to marine megafauna interactions as Environmental Delay in the daily dredge log.
- Record and report immediately any incident involving marine megafauna interactions (marine animal strike, marine stranding or an injured, sick or dead turtle, dugong, dolphin or whale) will be reported to the Qld DES (on 1300 130 372).
- Compile an incident report of all the details of any incident involving marine megafauna.
- The Manager Environment CU will report to DAWE (or successor agency) any exceedance of the MNES performance criteria and early warning trigger levels, including any implementation of MNES risk management, adaptive management strategies, corrective actions and emergency response measures implemented, within 21 days of the initial incident/exceedance notification

Maintain records of all inductions and training undertaken by small vessel Masters, crews and fauna observers that included relevant marine megafauna management requirements.

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Adaptive management program

- The Manager Environment CU will ensure new data/information is collected and incorporated into this plan/CEMP, as a result of implementing this plan and new information from external sources (e.g. academic literature, EPBC policy statements);
- The Environmental Advisor CU will effectively coordinate, schedule and/or trigger monitoring, risk management, auditing and reporting activities in association with marine ecology and MNES;
- The Manager Environment CU will periodically (min 6 monthly) review risks associated with construction activities and marine MNES, including in response to the risk level, changing circumstances or the results from implementing contingency response/corrective actions;
- The Manager Environment CU will periodically (min 6 monthly) review the effectiveness of management measures with relatively long implementation timeframes, significant levels of uncertainty and upon which the plan is highly dependent;
- The Manager Environment CU will implement corrective actions and amended mitigation measures should the monitoring programs specified in this element demonstrate a risk to the environment or MNES.
- The Manager Environment CU will address the consequences of significant environmental incidents (planned and unanticipated); and
- The Manager Environment CU will review the plan under the following circumstances:
 - performance reports indicate performance targets/indicators may not be achieved;
 - according to approved timeframes; or the impacts of significant environmental incidents.

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6.7. Terrestrial Fauna (avifauna)

Related to CEMP Section 5.7 – Terrestrial Ecology

Element	Terrestrial Ecology
Residual Risk Level	Objectives
MEDIUM	<ul style="list-style-type: none"> - To conduct construction activities in a manner that minimises adverse impacts on terrestrial fauna and flora. - To avoid injury to and death of fauna, particularly avifauna from construction activities. - To avoid or minimise the level of noise and light spill during construction activities on adjacent habitat areas used by shorebirds.

Activities

- Construction activities such as vehicle movements and earthworks may result in disturbance/injury/mortality of terrestrial fauna, particularly avifauna (Section 6.6.2).
- Noise emissions and vibration may lead to behavioural disturbance in fauna (Section 6.9).
- Light spill from the construction site and plant and equipment may lead to disturbance to surrounding avian habitats (Section 6.13).
- Introduction and/or spread of animal pests may adversely impact on terrestrial fauna (Section 6.8).

Performance Criteria / Indicators

- All works are managed in accordance with the relevant management plans (CEMP, MEMP), the *Environmental Protection Act 1994* and any other relevant approvals, standards, guidelines and statutory requirements.
- No incidents of harm or mortality to terrestrial fauna as a result of construction activities.
- No significant long-term distribution or diversity impacts to terrestrial fauna (avifauna) at off port sites (i.e. Ross River sandspit) as a result of construction activities, as measured by the Shorebird Monitoring Program (Appendix H, Document number POT 2156).
- No complaints are received from regulators or the community in relation to flora and/or fauna issues.

Mitigation	Responsibility
- Enforce site traffic management arrangements including speed limits to reduce avifauna collision (to meet Performance Criteria B).	Project Engineer CU
- Restrict haul truck movements to daylight hours to prevent disturbance to terrestrial fauna, particularly avifauna (to meet Performance Criteria A to D).	Project Engineer CU
- Limit disturbance of existing port lands for the project to maintain opportunistic habitat for avifauna; noting the reclamation works once completed will create more opportunistic avifauna habitat (to meet Performance Criteria C and D).	Project Engineer CU
- Implement procedures on the handling and reporting of injured fauna (to meet Performance Criteria A and D).	Environmental Advisor CU
- Ensure the CEMP and MEMP have been implemented on site (to meet Performance Criteria A).	Project Director Cu
- Review the results of each monitoring survey to capture any potentially negative trends forming in behavioural patterns associated with the construction works (to meet Performance Criteria C).	Environmental Advisor CU

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Element	Terrestrial Ecology	
Training (to meet Performance Criteria A to D)		Manager Environment CU
<ul style="list-style-type: none"> – Ensure that the appropriate CU Project personnel undertake environmental awareness and training covering the requirements regarding terrestrial fauna. 		

Monitoring and Auditing

Responsibility

- | | |
|---|--|
| <ul style="list-style-type: none"> – Conduct monitoring in accordance with Shorebird Monitoring Plan (POT 2156 Appendix H) before and during construction, to monitor for adverse impacts on shorebird populations and determine if any project related impacts occur on avifauna distribution and diversity. – Undertake regular site inspections for injured wildlife and record any incident(s). | Environmental Advisor CU

Environmental Advisor CU |
|---|--|

Corrective actions

Where Performance Criteria A to D are not met at any point throughout construction and reclamation, the following corrective actions must be undertaken:

- The Environmental Advisor CU / Manager Environment CU will commence an investigation of all incidents in relation to terrestrial fauna and/or flora within five business days and undertake appropriate actions, including reporting to the appropriate regulator within 48 hours where MNES are involved.
- The Manager Environment CU will respond to all complaints in relation to terrestrial fauna and/or flora within 2 business days and rectify legitimate problems as required.
- Implement revised control measures terrestrial fauna disturbance issues are identified (e.g. by way of further training, extended exclusion zones, further speed restrictions – depending upon exceedance locations).
- Undertake a review of the CEMP and MEMP and associated plans, to determine if further controls or mitigation measures are needed, where investigations show unacceptable impacts to terrestrial fauna.
- Implement any other corrective actions or mitigation measures as directed by the appropriate regulators.

It is to be noted that use of POTL land by shorebirds is opportunistic given it is to be developed and therefore this trigger is for diversity and abundance across the study area (not just POTL land).

Reporting

- The Contractor will maintain a site activity log, recording the type of activities occurring during various times of the day to assist with the retrospective investigation of any incidents / complaints.
- All CU Project personnel will inform the Manager Environment CU and Project Director CU as soon as possible in the event of a significant terrestrial fauna disturbance. The Manager Environment CU will investigate and report to the GM I&E, with any additional investigation(s) also undertake as required.
- The Manager Environment CU will report to DAWE (or successor agency) any exceedance of the MNES performance criteria and early warning trigger levels, including any implementation of MNES risk management, adaptive management strategies, corrective actions and emergency response measures implemented, within 21 days of the initial incident/exceedance notification.
- Any impacts identified via the shorebirds monitoring plan as a result of construction activities will be reported via that monitoring plan and inform reviews of the MEMP and CEMP.

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Element	Terrestrial Ecology
Adaptive management program	
<ul style="list-style-type: none"> - The Manager Environment CU will ensure new data/information is collected and incorporated into this plan/CEMP, as a result of implementing this plan and new information from external sources (e.g. academic literature, EPBC policy statements); - The Environmental Advisor will effectively coordinate, schedule and/or trigger monitoring, risk management, auditing and reporting activities in association with terrestrial ecology and MNES; - The Manager Environment CU will periodically (min 6 monthly) review risks associated with terrestrial ecology impacts, including in response to the risk level, changing circumstances or the results from implementing contingency response/corrective actions; - The Manager Environment CU will periodically (min 6 monthly) review the effectiveness of management measures with relatively long implementation timeframes, significant levels of uncertainty and upon which the plan is highly dependent; - The Manager Environment CU will implement corrective actions and amended mitigation measures should the monitoring programs specified in this element demonstrate a risk to the environment or MNES. - The Manager Environment CU will address the consequences of significant environmental incidents (planned and unanticipated); and - The Manager Environment CU will review the plan under the following circumstances: <ul style="list-style-type: none"> • performance reports indicate performance targets/indicators may not be achieved; • according to approved timeframes; or the impacts of significant environmental incidents. 	

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6.8. Invasive Marine Species*/Introduced Pests

Related to CEMP Section 5.8 – Weed and Animal Pest Management

* While Invasive Marine Species are a key element for the CU Project, it is a dredging related issue and therefore will be detailed and addressed in future versions of the MEMP.

Element		Invasive Marine Species/Introduced Pests
Residual Risk Level	Objectives	
LOW	To implement effective pest species management controls and avoid the increase of existing pest populations at the Project site.	
Activities		
<ul style="list-style-type: none"> Incorrect handling, storage of materials and waste and stormwater management may encourage pests and/or pest animals. 		

Performance Criteria / Indicators

- All works are managed in accordance with the obligations under the relevant management plans and any other relevant approvals, standards, guidelines and statutory requirements.
- Existing populations of introduced pests are controlled.
- No new pest infestations from construction activities.

Mitigation	Responsibility
<ul style="list-style-type: none"> Avoid conditions favourable to pest species (to meet performance Criteria A to C) by: <ul style="list-style-type: none"> Keeping the construction site area free of food waste or other attractants to pests such as mice, rats, dogs, cats and cane toads; and Undertaking appropriate waste management measures (Section 6.11). Implement appropriate pest control measures where necessary (i.e. when pest species are identified on the site). 	Project Engineer CU / Contractor
Training (to meet Performance criteria A to C)	
<ul style="list-style-type: none"> Ensure that the appropriate CU Project personnel undertake environmental awareness and training covering the requirements for pest management. 	Manager Environment CU

Monitoring and Auditing

- | Monitoring and Auditing | Responsibility |
|--|--------------------------|
| <ul style="list-style-type: none"> Monitor the presence and abundance of introduced fauna pests in the construction site. | Environmental Advisor CU |

Corrective actions

Where Performance Criteria A to C are not met at any point throughout construction, the following Corrective Actions must be undertaken:

- Engage licensed pest control contractor(s) to control pest numbers if required.
- Implement appropriate control measures where pest infestation or their potential to spread is identified in order to prevent reoccurrences.
- Investigate all incidents or complaints in relation to pest infestation promptly and undertaken appropriate actions.
- Undertake a review of the MEMP/CEMP, to determine if further controls are needed where investigations show new or expanded pest infestation.
- Implement any other corrective actions as directed by the appropriate regulators.

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6.9. Noise & Vibration

6.9.1. Minimise Impacts from Noise and Vibration from vessels (in association with rock wall construction)

Element	Noise & Vibration - Vessels
Residual Risk Level	Objectives
LOW	<ul style="list-style-type: none"> – To avoid or minimise impacts to MNES from noise or vibration associated with rock wall construction vessels – To meet all noise and vibration standards relating to marine vessels. – To protect the acoustic amenity and reduce nuisance noise that may impact on marine megafauna.
Activities	
<ul style="list-style-type: none"> – Small vessels associated with the construction works have the potential to increase noise emissions. – Noise emissions and vibration may lead to behavioural disturbance in marine megafauna or marine megafauna temporarily avoiding affected area. 	

Performance Criteria / Indicators

- A. No incidents of construction-related vessels causing direct or residual noise impacts to MNES, as measured through: -
 - o the Inshore Dolphin Monitoring Plan (MEMP App F, POT 2154);
 - o The Marine Megafauna Monitoring Plan (MEMP App G, POT 2155); and
 - o The Shorebird Monitoring Plan (MEMP App H, POT 2156).
- B. No injury or loss of marine megafauna because of construction-related vessel activities.
 - o No significant long-term behavioural impacts to marine megafauna from noise from construction-related vessels

Mitigation	Responsibility
– Ensure that engines and equipment on-board the construction-related vessels are properly maintained in good working order through carrying out routine and preventative maintenance (to meet Performance Criteria A, B and C).	Contractor
– Maintain and operate all equipment on-board the construction-related vessels in a safe and efficient manner (to meet Performance Criteria B).	Contractor
– Review the results of each monitoring survey to capture any potentially negative trends forming in behavioural patterns associated with the construction works (to meet Performance Criteria A)	Environmental Advisor CU
– Consider noise mitigation when operating small vessels (if appropriate) (to meet Performance Criteria C), including: <ul style="list-style-type: none"> • Selecting low-noise plant and equipment and maintain in good working order; • Installing high-quality mufflers and appropriate silencers that meet design specifications on plant and equipment where required; • Keeping equipment well maintained according to manufacturer’s instructions and recommendations; • Shutting down plant/ equipment which are used intermittently in the intervening periods between works or throttling down to minimum; 	Contractor

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Element	Noise & Vibration - Vessels	
	<ul style="list-style-type: none"> • Shutting down plant and equipment when not in use; and • Ensuring that only necessary power levels are used to complete activities. 	
	<ul style="list-style-type: none"> - Adopt marine megafauna (marine mammal and turtle) observation and response procedures (to meet Performance Criteria A and B) including: <ul style="list-style-type: none"> • Maintaining a lookout for cetaceans and turtles while small vessels are operating; • Adjusting vessel speed and direction, within the safety constraints of the vessel, to avoid impact on the observed individuals in the event that megafauna is sighted, including remaining greater than 150m from dolphins, turtles and dugongs, and 300m from whales. • Enforce vessel speed limits where appropriate (i.e. less than 6 knots in waters less than 2.5m depth or within 100m of shoreline) to reduce potential marine megafauna collision. <p>Noting that this may be exceeded during emergencies or for vessels requiring higher speed to maintain navigational safety.</p>	Contractors / Project Engineer CU / Manager Environment CU
	<p>Training (to meet Performance Criteria A and B)</p> <ul style="list-style-type: none"> - Ensure that the appropriate CU Project personnel undertake environmental awareness and training covering the requirements of this MEMP regarding noise and vibration controls. - Provide appropriate training to vessel crew responsible for marine megafauna spotting prior to commencement of small vessel operations. 	Contractors / Project Engineer CU Manager Environment CU

Monitoring / Auditing

- Conduct observations of marine megafauna by small vessel masters and crew on each construction-related vessel.
- Undertake regular audits / inspections to identify the need for noise suppression measures and the effectiveness of measures undertaken.
- Undertake Inshore Dolphin and Marine Megafauna Monitoring Plans (POT 2154 Appendix F, POT 2155 Appendix G) before, during, and after (for some) completion of the project, to determine if any project related impacts occur on megafauna behaviour..
- Review marine stranding’s data to identify any death or injury to megafauna that could be attributed to CU vessel operations through the Marine Megafauna Monitoring Plan (POT 2155 Appendix G).

Responsibility

- Contractors
- Environmental Advisor CU
- Environmental Advisor CU
- Environmental Advisor CU

Corrective Actions

Where Performance Criteria A to C are not met at any point throughout rock wall construction, the following corrective actions must be undertaken:

- The Manager Environment CU will commence an investigation into all incidents or complaints relating to potential noise/vibration impacts on marine megafauna within five business days including reporting to the appropriate regulator (within 48 hours for MNES).
- For acute impacts to marine megafauna from noise or vibration, Manager Environment CU will liaise with DES immediately to identify rescue options and develop future corrective actions if injury to marine megafauna occurs; and Assist in capture of injured animals following advice from regulators.

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Element	Noise & Vibration - Vessels
	<ul style="list-style-type: none"> - Undertake a review of the MEMP and associated plans, to determine if further controls or mitigation measures are needed where investigations show unacceptable impacts to marine megafauna. - Implement additional control measures (i.e. revised exclusion zones) where noise related performance criteria are exceeded or potential MNES / marine ecology issues are indicated. - Implement any other corrective actions as directed by the appropriate regulators.

Reporting

- The small vessel Master will maintain a site activity log, recording the type of activities occurring during various times of the day to assist with the retrospective investigation of any incidents / complaints.
- All vessel crew will inform the Master as soon as possible in the event of a small vessel noise issue that may lead to impact on marine megafauna and the Master will investigate and report to the Technical Manager CU.
- Maintain a record of sighted animals indicating the sighting of each individual animal and actions taken.
- Report down-time due to marine megafauna interactions as Environmental Delay in the daily vessel log.
- Record and report immediately any incident involving marine megafauna interactions (marine animal strike, marine stranding or an injured, sick or dead turtle, dugong, dolphin or whale) will be reported to the Qld DES (on 1300 130 372).
- Compile an incident report of all the details of any incident. The Project Director CU will inform the regulators in a timely manner in the event of a significant noise issue.
- Any impacts identified via the marine megafauna, inshore dolphins and shorebirds monitoring plans because of noise from small vessels will be reported via the specific monitoring plans and inform reviews of the relevant Management Plan.
- The Manager Environment CU report to DAWE (or successor agency) any exceedance of the MNES performance criteria and early warning trigger levels, including any implementation of MNES risk management, adaptive management strategies, corrective actions and emergency response measures implemented, within 21 days of the initial incident/exceedance notification.

Adaptive management program

- The Manager Environment CU will ensure new data/information is collected and incorporated into this plan/CEMP, as a result of implementing this plan and new information from external sources (e.g. academic literature, EPBC policy statements);
- The Environmental Advisor will effectively coordinate, schedule and/or trigger monitoring, risk management, auditing and reporting activities in association with vessel noise aspects;
- The Manager Environment CU will periodically (min 6 monthly) review risks associated with noise impacts from vessel operations, including in response to the risk level, changing circumstances or the results from implementing contingency response/corrective actions;
- The Manager Environment CU will periodically (min 6 monthly) review the effectiveness of management measures with relatively long implementation timeframes, significant levels of uncertainty and upon which the plan is highly dependent;
- The Manager Environment CU will implement corrective actions and amended mitigation measures should the monitoring programs specified in this element demonstrate a risk to the environment or MNES.
- The Manager Environment CU will address the consequences of significant environmental incidents (planned and unanticipated); and
- The Manager Environment CU will review the plan under the following circumstances:
 - performance reports indicate performance targets/indicators may not be achieved;
 - according to approved timeframes; or the impacts of significant environmental incidents.

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6.9.2. Minimise Impacts from Noise and Vibration from reclamation and piling activities

Related to CEMP Section 5.10 – Noise and Vibration; Section 5.6 and 5.7 – Marine and Terrestrial Ecology

Element	Noise & Vibration – Reclamation and Piling
Residual Risk Level	Objective
MEDIUM	<ul style="list-style-type: none"> – To avoid or minimise impacts to MNES from noise or vibration associated with reclamation and piling activities – To meet all noise and vibration standards relating to reclamation and piling activities, to minimise impacts on MNES, particularly marine and terrestrial megafauna.
Activities	
<ul style="list-style-type: none"> – Noise and vibration generated during construction activities may lead to behavioural disturbance to terrestrial or marine megafauna temporarily avoiding affected area. – On-site construction plant and equipment, particularly during piling works and rockfill reclamation, have the potential to increase noise emissions and cause vibrations that may disturb the surrounding natural environment / marine megafauna (MNES). 	

Performance Criteria / Indicators

- A. All works are managed in accordance with the relevant management plans (POT2135 MEMP, POT 2099 CEMP), the *Environmental Protection (Noise) Policy 2008* and *Environmental Protection Regulation 1998* and any other relevant approvals, standards, guidelines and statutory requirements.
- B. No significant long-term behavioural impacts to megafauna or shorebirds from reclamation and piling activities, as measured through: -
 - o the Inshore Dolphin Monitoring Plan (Appendix F, POT 2154);
 - o The Marine Megafauna Monitoring Plan (Appendix G, POT 2155); and
 - o The Shorebird Monitoring Plan (Appendix H, POT 2156).
- C. No piling occurs while marine megafauna are within the exclusion zone.
- D. No injury or loss of marine or terrestrial megafauna due to noise or vibration from reclamation or piling activities

Mitigation	Responsibility
Rockwall construction:	
<ul style="list-style-type: none"> – Restrict rockwall construction vehicle movements to daylight hours to prevent noise disturbance to roosting avifauna (to meet Performance Criteria D). 	Contractor / Project Engineer CU
<ul style="list-style-type: none"> – Ensure that engines and construction equipment are properly maintained in good working order through carrying out routine and preventative maintenance (to meet Performance Criteria A). 	Contractor
<ul style="list-style-type: none"> – Consider noise mitigation when operating construction equipment (where appropriate) (to meet Performance Criteria A and B), including: <ul style="list-style-type: none"> • Selecting low-noise plant and equipment and maintain in good working order; • Installing high-quality mufflers and appropriate silencers that meet design specifications on plant and equipment where required; • Shutting down plant and equipment which are used intermittently in the intervening periods between works or throttling down to minimum; • Shutting down plant and equipment when not in use; and 	Contractor

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Element	Noise & Vibration – Reclamation and Piling		
	<ul style="list-style-type: none"> Ensuring that only necessary power levels are used to complete capital-dredging related activities. 		
	<ul style="list-style-type: none"> Avoid megafauna interactions or impacts e.g. undertake marine fauna observations prior to start-up and during rockwall construction, applying observation and exclusion zones of 150m (to meet Performance Criteria A to D). 	Contractors / Project Engineer CU	
	<ul style="list-style-type: none"> Undertake underwater noise monitoring at commencement of construction to confirm impact zone distances for noise disturbance (as part of the Marine Megafauna Monitoring Plan (Appendix G, POT 2155) (to meet Performance Criteria A to D). 	Environment Advisor CU	
	<ul style="list-style-type: none"> Orientate noise emitting equipment away from foreshore whilst ensuring that Health and Safety requirements including Navigation Safety are maintained to minimise impacts on shorebirds (to meet Performance Criteria B). 	Contractor	
Piling:			
	<ul style="list-style-type: none"> Implement the Environmental Procedure for Pile Driving (Appendix J) for all piling works to manage noise and vibrations risks to marine megafauna (to meet Performance Criteria A to D), including: <ul style="list-style-type: none"> Establishing an exclusion zone to minimise the risk to marine megafauna from pile driving operations; Undertake initial underwater noise monitoring at the commencement of piling to validate the exclusion zone implemented. Ensuring pre-start visual observations for marine megafauna are undertaken across the observation zone by a suitably qualified marine observer for at least 30 mins prior to commencement of pile driving operations, and during pile driving operations. Only commence pile driving operations if marine megafauna have not been sighted in the exclusion zone for 30 mins; Initiate soft start procedures at the commencement of pile driving operations with a gradual increase in piling impact energy of no more than 50% of full impact energy for 10 minutes, including after breaks in piling of 30 mins or more; Implementation of stand-by procedures if marine megafauna are sighted within the observation zone during the soft-start or normal operations; Ceasing pile driving operations if marine megafauna are observed in, or about to enter, the exclusion zone; Not commencing pile driving operations between the hours of sunset and sunrise. Pile driving that has commenced before sunset (or a period of low visibility) may continue after sunset, unless pile driving operations have been suspended for more than 15 minutes. 	Contractors / Project Engineer CU	
	<ul style="list-style-type: none"> The requirements of the Environmental Procedure for Pile Driving (as detailed above) must also be applied to re-strike testing activities. A maximum of 15 full force blows of the pile hammer may be applied to each test pile on a maximum of two re-strike test events per test pile (to meet Performance Criteria D). 	Contractors / Project Engineer CU	
	<ul style="list-style-type: none"> Consider alternative piling methods, e.g. screw-type piling in place of impact piling if these alternative methods are available and feasible and 	Contractors / Project Engineer CU	

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Element	Noise & Vibration – Reclamation and Piling	
	provide equivalent or better protection to marine fauna (to meet Performance Criteria D).	
	<ul style="list-style-type: none"> If alternative piling methods are to be implemented, the MEMP and associated Environmental Procedure for Pile Driving will be updated to include the alternative mitigation measures, peer reviewed and approval of the revised MEMP sought in accordance with EPBC Act Approval Condition 23 (to meet Performance Criteria B and D). Review the results of each monitoring survey to capture any potentially negative trends forming in behavioural patterns associated with the construction works (to meet Performance Criteria B) 	<p>Manager Environment CU</p> <p>Environmental Advisor CU</p>
	<p>Training (to meet Performance Criteria A to D).</p> <ul style="list-style-type: none"> Ensure that the appropriate CU Project personnel undertake environmental awareness and training covering the requirements of this MEMP, particularly: <ul style="list-style-type: none"> appropriate training to construction crews in relation to noise and vibration. appropriate training to construction crew responsible for marine megafauna spotting prior to commencement of rockwall construction activities. 	<p>Manager Environment CU / Contractor</p>

Monitoring / Auditing

Responsibility

- | | |
|--|--------------------------|
| <ul style="list-style-type: none"> Records of visual observations by marine fauna observers during pile driving operations. | Contractor |
| <ul style="list-style-type: none"> Undertake regular inspections/audits to identify the need for noise and vibration suppression measures and the effectiveness of measures undertaken. | Environmental Advisor CU |
| <ul style="list-style-type: none"> Conduct monitoring in accordance with the Inshore Dolphin, Marine Megafauna and Shorebird Monitoring Plans (Appendix F, Appendix G, Appendix H). | Environmental Advisor CU |
| <ul style="list-style-type: none"> Monitor and adjust where necessary, elements of piling such as reducing the height and weight of the impact hammer. | Contractor |
| <ul style="list-style-type: none"> Conduct observations for marine megafauna by marine observers prior to commencing and during rockwall and reclamation construction activities and cease works if marine megafauna enter exclusion zones. | Environment Manager CU |
| <ul style="list-style-type: none"> For piling, continue observations for marine megafauna across the observation zone by a suitably qualified marine observer before and during pile driving operations. | Environment Manager CU |

Corrective actions

Where Performance Criteria A to D are not met at any point throughout reclamation and piling, the following corrective actions must be undertaken:

- The Manager Environment CU will commence an investigation into all incidents relating to potential noise impacts on marine megafauna and shorebirds within five business days, including reporting to the appropriator regulator.
- Undertake a review of the CEMP/MEMP to determine if further controls are needed where investigations show unacceptable noise or vibration levels from reclamation or piling activities.

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Element	Noise & Vibration – Reclamation and Piling
	<ul style="list-style-type: none"> - Implement additional control measures, including reviewing and modifying plant, equipment and construction practices, in a timely manner where noise or vibration performance criteria are exceeded or are identified. - The Environmental Advisor CU/Manager Environment CU will respond to all complaints in relation to noise or vibration impacts to megafauna within 2 business days and rectify legitimate problems as required. - Implement any other corrective actions as directed by regulators.

Reporting

- The Contractor will maintain a site activity log, recording the type of activities occurring during various times of the day to assist with the retrospective investigation of any incidents / complaints.
- All CU Project personnel will inform the Manager Environment CU and Project Director CU as soon as possible in the event of a significant noise or vibration management issue that could disturb marine or terrestrial ecology. The Manager Environment CU will investigate and report to the GM I&E CU, with any additional investigation(s) undertaken as required.
- The Manager Environment CU will report to DAWE (or successor agency) any exceedance of the MNES performance criteria and early warning trigger levels, including any implementation of MNES risk management, adaptive management strategies, corrective actions and emergency response measures implemented, within 21 days of the initial incident/exceedance notification.
- Any impacts identified via the marine megafauna, inshore dolphins and shorebirds monitoring plans because of construction activities including piling will be reported via the specific monitoring plans and inform reviews of the relevant Management Plan (MEMP and CEMP).

Adaptive management program

- The Manager Environment CU will ensure new data/information is collected and incorporated into this plan/CEMP, as a result of implementing this plan and new information from external sources (e.g. academic literature, EPBC policy statements);
- The Environmental Advisor will effectively coordinate, schedule and/or trigger monitoring, risk management, auditing and reporting activities in association with construction noise aspects;
- The Manager Environment CU will periodically (min 6 monthly) review risks associated with noise impacts from construction activities, including in response to the risk level, changing circumstances or the results from implementing contingency response/corrective actions;
- The Manager Environment CU will periodically (min 6 monthly) review the effectiveness of management measures with relatively long implementation timeframes, significant levels of uncertainty and upon which the plan is highly dependent;
- The Manager Environment CU will implement corrective actions and amended mitigation measures should the monitoring programs specified in this element demonstrate a risk to the environment or MNES.
- The Manager Environment CU will address the consequences of significant environmental incidents (planned and unanticipated); and
- The Manager Environment CU will review the plan under the following circumstances:
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 - according to approved timeframes; or the impacts of significant environmental incidents.

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6.10. Hazardous Materials Handling & Storage

Related to CEMP 5.11 – Hazardous Materials Handling and Storage

Element		Hazardous Materials Handling & Storage
Residual Risk Level	Objectives	
MEDIUM	To minimise the risks associated with the handling and storage of hazardous materials used in construction activities, from impacting on MNES, particularly terrestrial and marine megafauna.	
Activities		
<ul style="list-style-type: none"> – Potential impacts to the environment and terrestrial or marine megafauna (MNES) from exposure to hazards and hazardous materials. – Incorrect storage and handling of hazardous substances and wastes including regulated waste may result in contamination of the marine environment. – Spills or leakage of fuel/oil and other hazardous materials or dangerous goods may cause contamination of the marine environment. – Incidents may occur whereby contaminants are accidentally released which may adversely impact the surrounding marine environment. 		

Performance Criteria / Indicators

- A. All works are managed in accordance with the relevant management plans (MEMP, CEMP), the *Environmental Protection Act 1994* and any other relevant approvals, standards, guidelines and statutory requirements.
- B. Fuel / chemical storage is kept in a secure area, and banded to prevent spills.
- C. All spills are reported and adequately contained and promptly cleaned up.
- D. No marine or stormwater contamination from leaks and spills on land or on-board vessels.
- E. No injury to terrestrial or marine megafauna because of the handling and storage of hazardous materials on site.
- F. No inappropriate storage or disposal of hazardous waste.

Mitigation	Responsibility
– Hold and maintain relevant statutory licenses, permits and/or approvals prior to the storage and use of hazardous goods (particularly licensed dangerous goods) if required (to meet Performance Criteria A).	Manager Environment CU
– Undertake storage and transport of chemicals, fuel/oil, hazardous/dangerous goods in accordance with relevant manufacturer’s instructions, Australian standards, guidelines and legislation (to meet Performance Criteria B), including: <ul style="list-style-type: none"> • AS1940 The Storage and Handling of Flammable and Combustible Liquids; • AS4452 The Storage and Handling of Toxic Substances; and • Dangerous Goods Safety Management Act 2001 and other legislative requirements. 	Contractor
– Ensure storage areas include appropriate bunding to contain spillages in accordance with applicable standards and are covered to prevent stormwater/wave infiltration (to meet Performance Criteria B).	Contractor
– Locate storage areas away from the marine environment (to meet Performance Criteria B and C).	Contractor / Project Engineer CU

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Element	Hazardous Materials Handling & Storage	
-	Maintain records on chemicals, fuel, dangerous goods and hazardous materials used during construction activities as required by SDSs (to meet Performance Criteria A and F).	Contractor
-	Keep SDSs for hazardous materials readily available in a prominent location and manage hazardous products in accordance with the SDS requirements (to meet Performance Criteria A).	Contractor
-	Minimise the use of hazardous materials and implement alternatives where feasible (to meet Performance Criteria A and F).	Contractor
-	Plan the delivery of hazardous materials to site in line with construction requirements to avoid the need to store significant quantities of hazardous materials on site (to meet Performance Criteria A and F).	Contractor
-	Minimise the risk of fuel/oil spills by undertaking regular inspections and maintenance of plant and equipment at or above manufacturers requirements (to meet Performance Criteria B, C and D), including: <ul style="list-style-type: none"> • Daily inspection of plant and equipment; and • Maintenance of site plant and equipment in accordance with manufacturer’s recommendations. • Ensuring service records are up to date and the equipment has the applicable permits, licences and insurances. 	Contractor
-	Conduct plant and equipment maintenance and refuelling only in designated workshop areas (to meet Performance Criteria C, D and E).	Contractor
-	Undertake collection and transportation of designated hazardous wastes by an appropriately licensed contractor only (to meet Performance Criteria A and F).	Contractor
-	Minimise the risk of contaminant spills (to meet Performance Criteria A, B and F) by: <ul style="list-style-type: none"> • Developing and implementing hazardous material handling procedures; • Developing and implementing emergency response procedures; • Undertaking spill response training for staff; and • Providing spill control materials including booms and absorbent materials in the event of any spills. 	Contractor
-	Maintain an appropriate spill kit, personal protective equipment and relevant operator instructions / emergency procedures for the management of hazardous materials on all vessels, in a conveniently location so that spills can be quickly responded to, (to meet Performance Criteria A and F).	Contractor
-	Implement emergency response procedures for fuel, oil and chemical use including as a minimum the use of appropriate spill response kits, the involvement of adequately trained CU Project personnel and the incorporation of a contact protocol for emergency services and the notification of regulators (to meet Performance Criteria A and C).	Contractor
-	Make available first aid and firefighting equipment (handheld extinguishers and fire hoses) at the site (to meet Performance Criteria A).	Contractor

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Element		Hazardous Materials Handling & Storage	
Training (to meet Performance Criteria A to F)		Manager Environment CU	
<ul style="list-style-type: none"> – Ensure that the appropriate CU Project personnel undertake environmental awareness and training covering the requirements of the MEMP and CEMP regarding hazardous materials handling and storage and spill response 			
Monitoring and Auditing		Responsibility	
<ul style="list-style-type: none"> – Undertake routine inspections to monitor construction site for compliance with hazardous material handling and storage requirements, including maintenance of spill kits, checking for leaks, spillage and damage to bunded/storage/refuelling areas and plant and equipment. 		Environmental Advisor CU	
<ul style="list-style-type: none"> – Undertake regular visual inspections of hazardous waste storage containers to determine their integrity and identify if any spills or leakage has or is occurring. 		Environmental Advisor CU	
<ul style="list-style-type: none"> – Undertake visual inspections of fuel transferring equipment and surrounding water during and after fuel transfer 		Contractor	
<ul style="list-style-type: none"> – Inspect the SDS register regularly for currency and completeness. 		Safety Officer CU	
<ul style="list-style-type: none"> – Undertake checks of compliance against the relevant management plan (i.e. CEMP) through auditing processes (Section 4.12). 		Environmental Advisor CU	

Corrective actions

Where Performance Criteria A to F are not met at any point throughout construction and reclamation, the following corrective actions must be undertaken:

- Maintain and repair any damage to storage areas and/or bunds promptly.
- Implement additional control measures as soon as practicable where performance criteria are exceeded or hazardous materials issues are identified.
- The Manager Environment CU will commence an investigation into all incidents relating to hazardous materials and/or fuel bunkering and undertake appropriate corrective or remedial actions, as required to render the area safe and avoid or minimise environmental harm.
- The Manager Environment CU will respond to all complaints in relation to hazardous materials within two business days and rectify legitimate problems as required.
- Review fuelling practices and rectify immediately if an unintentional release or spill occurs.
- Undertake a review of the management plans (e.g. CEMP) to determine if further controls are required where investigations show control measures are not fit for purpose.
- Review procedures, if procedures breakdown or a spill occurs and train staff about appropriate responses.
- Implement any other corrective actions and mitigation measures as directed by the appropriate regulators.

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Element Hazardous Materials Handling & Storage

Reporting

- The Contractor will maintain a site activity log, recording the type of activities occurring during various times of the day to assist with the retrospective investigation of any incidents / complaints / land contamination issues.
- All CU Project personnel will inform the Manager Environment CU and Project Engineer CU immediately of any incidents caused by the handling and storage of hazardous materials resulting in potential or actual environmental harm. The Manager Environment CU will investigate and report to the GM I&E with any additional investigation(s) undertaken as required.
- The Manager Environment CU will report to the appropriate regulators any release of contaminants or other significant incident, including any follow up actions/remediation/adaptive management undertaken.
- Provide incident reports detailing any spills or incidents involving hazardous waste, fuel bunkering and clean-up operations as per Environmental Incident procedures.

Adaptive management program

- The Manager Environment CU will ensure new data/information is collected and incorporated into this plan/CEMP, as a result of implementing this plan and new information from external sources (e.g. academic literature, EPBC policy statements);
- The Environmental Advisor will effectively coordinate, schedule and/or trigger monitoring, risk management, auditing and reporting activities in association with hazardous materials handling and storage;
- The Manager Environment CU will periodically (min 6 monthly) review risks associated with hazardous materials on site, including in response to the risk level, changing circumstances or the results from implementing contingency response/corrective actions;
- The Manager Environment CU will periodically (min 6 monthly) review the effectiveness of management measures with relatively long implementation timeframes, significant levels of uncertainty and upon which the plan is highly dependent;
- The Manager Environment CU will implement corrective actions and amended mitigation measures should the monitoring and auditing specified in this element demonstrate a risk to the environment or MNES.
- The Manager Environment CU will address the consequences of significant environmental incidents (planned and unanticipated); and
- The Manager Environment CU will review the plan under the following circumstances:
 - performance reports indicate performance targets/indicators may not be achieved;
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6.11. Waste Management

Related to CEMP Section 5.12 – Waste Management

Element	Waste Management
Residual Risk Level	Objective
LOW	<ul style="list-style-type: none"> – To avoid impacts from general waste impacting upon MNES from construction activities – To appropriately handle, store, recycle and dispose of all waste materials generated during construction activities to prevent impacts on MNES, particularly marine megafauna. – To prevent litter or waste generated by the construction activities from causing a hazard or nuisance.
Activities	
<ul style="list-style-type: none"> – Construction activities will generate waste (i.e. packaging, general waste, effluent). – Incorrect handling and storage of waste may result in the introduction of wastes into the marine environment. – Incorrect handling and storage of waste may encourage pests (Section 6.11). 	

Performance Criteria / Indicators

- All waste is managed in accordance with the relevant management plans (CEMP POT 2099), the Environmental Protection Act 1994 and any other relevant approvals, standards, guidelines and statutory requirements.
- No injury of death to marine megafauna / MNES because of waste generated from construction activities.
- No complaints are received from regulators or the community in relation to waste issues.

Mitigation	Responsibility
<ul style="list-style-type: none"> – Adopt the waste management hierarchy (i.e. avoid, re-use, recycle, energy recover and dispose) (to meet Performance Criteria A). 	Project Director CU / Contractor / Manager Environment CU
<ul style="list-style-type: none"> – Avoid impacts to MNES, (to meet Performance Criteria B), by: <ul style="list-style-type: none"> • Minimising the amount of any materials required to be brought and stored on site; and • Implementing options to reduce the amount of packaging on procured goods. 	Project Director CU / Contractor / Manager Environment CU
<ul style="list-style-type: none"> – Ensure all wastes, recyclable wastes and storing non-recyclable materials/wastes (including foods, regulated and hazardous wastes) in separate bins or areas as appropriate, for regular collection by a licensed waste contractor and recycling/disposal off-site in a licensed facility (to meet Performance Criteria A). 	Project Director CU / Contractor
<ul style="list-style-type: none"> – Store hazardous and asphaltic wastes and empty drums and storage containers in an appropriate bunded and covered area (Section 6.10) (to meet Performance Criteria A, B and C). 	Contractor
<ul style="list-style-type: none"> – Secure waste disposal bins and fit with secure lids to prevent waste material being blown into the marine environment during storage or handling (to meet Performance Criteria A and B). 	Contractor
<ul style="list-style-type: none"> – Keep waste, which has the propensity to blow away or attract pest and native fauna, in receptacles with lids (to meet Performance Criteria A and B). 	Contractor

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Element	Waste Management	
	<ul style="list-style-type: none"> Conduct general waste transport in a manner that does not cause littering or unlawful waste disposal or generate excessive odours (to meet Performance Criteria A, B and C). 	Contractor
	<p>Training (to meet Performance Criteria A, B and C)</p> <ul style="list-style-type: none"> Ensure that the appropriate CU Project personnel undertake environmental awareness and training covering the requirements of the MEMP and CEMP regarding waste management. 	Manager Environment CU

Monitoring and Auditing

- Undertake regular inspections of on-site facilities to ensure all waste is being stored, handled, disposed and transported in accordance with regulations.
- Undertake regular visual inspections of waste storage containers to determine their integrity and identify if any spills or leaks have occurred.
- Undertake inspections of the effectiveness of waste management controls after significant rainfall events.
- Review marine stranding's data to identify any death or injury to megafauna that could be attributed to CU vessel operations through the Marine Megafauna Monitoring Plan (POT 2155 Appendix G).

Responsibility

- Environmental Advisor CU
- Environmental Advisor CU
- Environmental Advisor CU
- Environmental Advisor CU

Corrective Actions

Where Performance Criteria A to C are not met at any point throughout construction and reclamation, the following corrective actions must be undertaken:

- Retrieve any waste material lost to stormwater or the marine environment, if practicable.
- Review waste management practices causing material loss and take immediate action to rectify.
- Implement additional waste management control measures and training where performance criteria are exceeded or waste issues are identified.
- The Manager Environment CU will commence an investigation into all incidents in relation to waste management within five business days, including reporting to the appropriate regulator where MNES are involved (within 48 hours).
- The Manager Environment CU will respond to all complaints received in relation to waste management within two business days and rectify legitimate problems.
- Undertake a review of the MEMP/CEMP to determine if further controls are needed where investigations show unacceptable waste issues.
- Implement any other corrective actions as directed by the appropriate regulators.

Reporting

- The Contractor will maintain a waste tracking system, recording the movement of waste to assist with the retrospective investigation of any incidents / complaints.
- All CU Project personnel will inform the Manager Environment CU and Project Engineer CU as soon as possible in the event of any significant waste management issue. The Manager Environment CU will investigate and report to the GM I&E with any additional investigation(s) undertaken as required.
- The Manager Environment CU report to DAWE (or successor agency) any exceedance of the MNES performance criteria and early warning trigger levels, including any implementation of MNES risk management, adaptive management strategies, corrective actions and emergency response measures implemented, within 21 days of the initial incident/exceedance notification.

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Element	Waste Management
Adaptive management program	
<ul style="list-style-type: none"> - The Manager Environment CU will ensure new data/information is collected and incorporated into this plan/CEMP, as a result of implementing this plan and new information from external sources (e.g. academic literature, EPBC policy statements); - The Environmental Advisor will effectively coordinate, schedule and/or trigger monitoring, risk management, auditing and reporting activities in association with waste management; - The Manager Environment CU will periodically (min 6 monthly) review risks associated with construction related wastes, including in response to the risk level, changing circumstances or the results from implementing contingency response/corrective actions; - The Manager Environment CU will periodically (min 6 monthly) review the effectiveness of management measures with relatively long implementation timeframes, significant levels of uncertainty and upon which the plan is highly dependent; - The Manager Environment CU will implement corrective actions and amended mitigation measures should the monitoring and auditing specified in this element demonstrate a risk to the environment or MNES. - The Manager Environment CU will address the consequences of significant environmental incidents (planned and unanticipated); and - The Manager Environment CU will review the plan under the following circumstances: <ul style="list-style-type: none"> • performance reports indicate performance targets/indicators may not be achieved; • according to approved timeframes; or the impacts of significant environmental incidents. 	

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6.12. Cultural Heritage

Related to CEMP Section 5.15 – Cultural Heritage.

Element		Cultural Heritage
Residual Risk Level	Objectives	
MEDIUM	<ul style="list-style-type: none"> – To conduct all construction activities in accordance with the <i>Aboriginal and Cultural Heritage Act 2003 Duty of Care Guidelines</i>. – To avoid disturbance of significant Traditional Owner values, artefacts or places during construction activities. 	
Activities		
<ul style="list-style-type: none"> – Construction activities have the potential to impact on MNES that have significance from a cultural heritage perspective. – Disturbance or loss of significant Traditional Owner cultural heritage values may occur. 		
Performance Criteria / Indicators		
<p>A. All works are managed in accordance with the relevant management plans, the applicable Commonwealth and State legislation and standards and any other relevant approvals, standards, guidelines and statutory requirements.</p> <p>B. No loss or disturbance of significant Traditional Owner values resulting from construction activities.</p> <p>C. No complaints from the regulators or people likely to be affected by damage to Traditional Owner areas or sites.</p>		
Mitigation		Responsibility
<ul style="list-style-type: none"> – Existing Cultural Heritage Management Plan developed in consultation with Traditional Owners (to meet Performance Criteria B). 		POTL Legal Section
<ul style="list-style-type: none"> – Engage in ongoing consultation with Traditional Owners in accordance with the Cultural Heritage Management Plan (to meet Performance Criteria A). 		Project Director CU
<ul style="list-style-type: none"> – Provide cultural heritage induction to relevant CU Project personnel prior to commencement of work (to meet Performance Criteria B and C). 		Manager Environment CU
<ul style="list-style-type: none"> – Where Traditional Owner cultural heritage values (associated with MNES) are impacted during construction activities, works are to cease immediately in the vicinity (minimum radius of 20m) of the location pending a review by Traditional Owner representative(s) (to meet Performance Criteria A). 		Project Director CU/ Contractor
<ul style="list-style-type: none"> – Works in the area are not to recommence in the vicinity of the location until agreed actions are implemented or Traditional Owner representative/s confirm issue is resolved (to meet Performance Criteria A, B and C). 		Project Director CU/ Contractor
Training (to meet Performance Criteria A, B and C).		
<ul style="list-style-type: none"> – Ensure that the appropriate CU Project personnel undertake environmental awareness and training covering the requirements of the MEMP regarding cultural heritage. 		Manager Environment CU

Monitoring and Auditing

- Undertake regular site inspections to assess the effectiveness of implementation of the mitigation measures to confirm that specific controls and work practices are employed and effective.

Responsibility

Environmental Advisor CU

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Element	Cultural Heritage
<p>Corrective actions</p> <ul style="list-style-type: none"> - Review the Cultural Heritage Management Plan and consultation protocol if there are risks of unexpected adverse impacts or in response to complaints. - Follow advice provided after site inspections by a representative from the Traditional Owners. - Investigate all incidents in relation to cultural heritage promptly and implement recommended and appropriate management actions. - Investigate all complaints in relation to cultural heritage promptly and rectify legitimate problems. - Undertake a review of the MEMP/CEMP and implement further controls where investigations show non-conformances in relation to cultural heritage or cultural heritage issues are identified or have the potential to occur in the future and rectify in an appropriate manner and in consultation with the Traditional Owners. - Implement any other corrective actions as directed by the appropriate regulators. 	

Reporting

- All CU Project personnel will notify the Manager Environment CU and Project Director CU immediately of any actions that have the potential to impact on matters of cultural heritage significance. The Manager Environment CU will investigate and report to the GM I&E.
- The Manager Environment CU and POTL Legal will inform the Traditional Owners / DES of any suspected Traditional Owner discoveries in accordance with the Cultural Heritage Management Plan.

Adaptive management program

- The Manager Environment CU will ensure new data/information is collected and incorporated into this plan/CEMP, as a result of implementing this plan and new information from external sources (e.g. academic literature, EPBC policy statements);
- The Environmental Advisor will effectively coordinate, schedule and/or trigger monitoring, risk management, auditing and reporting activities;
- The Manager Environment CU will periodically (min 6 monthly) review risks associated with Traditional owner cultural heritage, including in response to the risk level, changing circumstances or the results from implementing contingency response/corrective actions;
- The Manager Environment CU will periodically (min 6 monthly) review the effectiveness of management measures with relatively long implementation timeframes, significant levels of uncertainty and upon which the plan is highly dependent;
- The Manager Environment CU will implement corrective actions and amended mitigation measures should the monitoring and auditing specified in this element demonstrate a risk to the environment or MNES; and
- The Manager Environment CU will review the plan under the following circumstances:
 - performance reports indicate performance targets/indicators may not be achieved;
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6.13. Artificial Light

Related to CEMP Section 5.16 – Visual Amenity and Lighting; Section 5.6 and 5.7 – Marine and Terrestrial Ecology

Element		Artificial Light
Residual Risk Level	Objective	
MEDIUM	<ul style="list-style-type: none"> - To minimise temporary/potentially adverse light impacts on MNES, particularly marine megafauna, associated with construction activities including capital dredging-related activities. - To avoid light pollution generated for construction activities including capital dredging-related activities. 	
Activities		
<ul style="list-style-type: none"> - Light spill from construction activities may disturb or negatively impact on MNES, particularly marine and terrestrial megafauna. 		

Performance Criteria / Indicators

- No significant long-term behavioural impacts to marine megafauna or terrestrial avifauna due to light disturbance from the construction activities, as measured through: -
 - the Inshore Dolphin Monitoring Plan (Appendix F, POT 2154);
 - The Marine Megafauna Monitoring Plan (Appendix G, POT 2155); and
 - The Shorebird Monitoring Plan (Appendix H, POT 2156).
- All works are managed in accordance with the relevant management plans (CEMP), the applicable Commonwealth and State legislation and standards and any other relevant approvals, standards, guidelines and statutory requirements.
- Minimal light spill outside of POTL controlled areas, whilst maintaining suitable and safe navigational lighting throughout construction and reclamation (including dredging)
- No complaints are received from regulators or the community in relation to visual amenity or lighting.

Mitigation	Responsibility
<ul style="list-style-type: none"> - Manage lighting design, installation and orientation to reduce light spill, ensuring it remains compliant with Operational Health and Safety and maritime safety requirements (to meet Performance Criteria A). 	Contractor / Project Director CU
<ul style="list-style-type: none"> - Where safe to do so, design and orientate lighting on the construction site, (to meet Performance Criteria C and D) to: <ul style="list-style-type: none"> • Reduce light spill from the site in the direction of shorebird habitat on the spit at the mouth of Ross River; and • Reduce light spill from the site onto the surrounding marine environment. 	Project Engineer CU / Contractor
<ul style="list-style-type: none"> - Comply with relevant guidelines for exterior lighting, such as AS4282: Control of the Obtrusive Effects of Outdoor Lighting to minimise light spill (to meet Performance Criteria B and C). 	Project Engineer CU
<ul style="list-style-type: none"> - Apply light spill control measures where it is determined there is a high risk to marine and / or terrestrial fauna (to meet Performance Criteria B). 	Project Engineer CU
<ul style="list-style-type: none"> - All land side operations, with the exception of placement of dredge material, will be daylight operations only and therefore will be limited operational lighting required (to meet Performance Criteria A to D). 	Project Director CU / Environment Manager CU

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Marine Environmental Management Plan

- Review the results of each monitoring survey to capture any potentially negative trends forming in behavioural patterns associated with the construction works (to meet Performance Criteria A) Environmental Advisor
CU

Training (to meet Performance Criteria A to D).

- Ensure that the appropriate CU Project personnel undertake environmental awareness and training covering the requirements regarding lighting issues. Manager Environment CU

Monitoring and Auditing

Responsibility

- Undertake regular inspection of areas surrounding the port development area, particularly following changed lighting conditions e.g. at different phases of the CU Project to assess any light spill. Environmental Advisor CU
- Conduct monitoring in accordance with the Inshore Dolphin, Marine Megafauna and Shorebird Monitoring Plans (Appendix F, Appendix G, Appendix H) to determine if any project related impacts occur on megafauna behaviour. Environmental Advisor CU

Corrective actions

Where Performance Criteria A to D are not met at any point throughout construction and reclamation, the following corrective actions must be undertaken:

- Review and modify lighting management practices if any adverse impacts are observed / reported.
- The Manager Environment CU will commence an investigation into all incidents in relation to lighting impacts to MNES within five business days including reporting to the appropriate regulator.
- The Manager Environment CU will respond to all complaints or issues noted in relation to lighting impacts within two business days and rectify legitimate problems as required.
- Undertake a review of the MEMP/CEMP and implement further controls where investigations show unacceptable impacts from lighting.
- Implement any other corrective actions as directed by the appropriate regulators.

Reporting

- All CU Project personnel will inform the Manager Environment CU and Project Director CU of any incidents regarding light spill or potential impacts on the marine environment. The Manager Environment CU will investigate and report to the GM I&E with any additional investigation(s) undertaken as required.
- The Manager Environment CU provide a report to DAWE (or successor agency) any exceedance of the MNES performance criteria and early warning trigger levels, including any implementation of MNES risk management, adaptive management strategies, corrective actions and emergency response measures implemented, within 21 days of the initial incident/exceedance notification.

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Adaptive management program

- The Manager Environment CU will ensure new data/information is collected and incorporated into this plan/CEMP, as a result of implementing this plan and new information from external sources (e.g. academic literature, EPBC policy statements);
- The Environmental Advisor will effectively coordinate, schedule and/or trigger monitoring, risk management, auditing and reporting activities in association with project lighting and light spill;
- The Manager Environment CU will periodically (min 6 monthly) review risks associated with construction lighting impacts, including in response to the risk level, changing circumstances or the results from implementing contingency response/corrective actions;
- The Manager Environment CU will periodically (min 6 monthly) review the effectiveness of management measures with relatively long implementation timeframes, significant levels of uncertainty and upon which the plan is highly dependent;
- The Manager Environment CU will implement corrective actions and amended mitigation measures should the monitoring and auditing specified in this element demonstrate a risk to the environment or MNES.
- The Manager Environment CU will address the consequences of significant environmental incidents (planned and unanticipated); and
- The Manager Environment CU will review the plan under the following circumstances:
 - o performance reports indicate performance targets/indicators may not be achieved;
 - o according to approved timeframes; or the impacts of significant environmental incidents.

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7. SUMMARY OF MATTERS OF NATIONAL ECOLOGICAL SIGNIFICANCE MANAGEMENT

For ease of reference, Table 6 summarises the project specific management controls, performance criteria, early warning triggers and corrective actions relevant to MNES for rockwall construction. This table incorporates relevant aspects from the Environmental Elements tables in Section 6.

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Marine Environmental Management Plan

Table 6: Summary of MNES Management aspects for CU Project Rockwall Construction (presented per relevant Plan)

MEMP

Objective	Performance Criteria	Controls	Performance Indicators	Early-warning trigger levels	Corrective Actions
<i>To avoid or minimise impacts to MNES by preventing or minimising impacts from construction and operational activities in the marine environment</i>	No injury or fatality to marine megafauna as a result of the Rock wall construction activities.	<p>Ensure suitably trained Marine Fauna Observers for rock wall construction activities to undertake visual observation of marine megafauna around construction fronts.</p> <p>Conduct daily pre-start checks for marine fauna in the nominated observation zone prior to commencing construction activities.</p> <p>Maintain active awareness of marine megafauna throughout daily construction activities, including within the exclusion zone.</p> <p>Cease all rock wall construction activities if marine fauna enter the deemed exclusion zones as specified in the MEMP (POT 2135) to avoid injury or loss of megafauna.</p>	<p>Marine megafauna exclusions zones are implemented for the duration of rock wall construction.</p> <p>Underwater noise assessments confirm the exclusion zones being implemented are appropriate.</p> <p>100% of personnel undertaking marine fauna observations are suitably trained.</p> <p>Construction works are ceased on 100% of occasions when marine megafauna are observed within the relevant exclusion zone.</p> <p>Site based inspections/audits of marine fauna observers do not identified any significant non-conformances.</p> <p>Daily fauna logs maintained by fauna observers.</p> <p>Daily fauna logs audited by POTL regularly.</p>	<p>Change in site personnel involved in activities that require marine fauna observation.</p> <p>Daily fauna logs missing or not present for all days of operation.</p> <p>Non-conformance identified from audits relating to marine fauna observation.</p> <p>Decreased trend in recorded stop works frequency.</p> <p>Any reported marine megafauna stranding or deaths in Cleveland Bay.</p> <p>Any injured marine megafauna in the vicinity of the rock wall construction activities</p>	<p>All fauna observers undergo refresher training.</p> <p>Review of onboarding process / training matrix for new employees.</p> <p>Number of fauna observation audits increased to ensure no further non-conformances.</p> <p>Attend Toolbox meetings with construction contractors.</p> <p>Escalation through contractual process if consecutive CAR raised relating to marine fauna observation.</p>

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Objective	Performance Criteria	Controls	Performance Indicators	Early-warning trigger levels	Corrective Actions
		<p>Works do not commence until the marine megafauna has exited the exclusion zone, or a period of 30 minutes has elapsed since the last sighting of the animal in the exclusion zone.</p> <p>Monitor the rock wall/revetment area during lead up to, and enclosure of rock wall areas to identify if any marine megafauna are in danger of, or are, entrapped.</p>	<p>No complaints received in relation to rock wall construction impacts on marine megafauna.</p> <p>No marine megafauna stranding reports associated with rock wall construction activities.</p> <p>Protocol followed to remove individuals safely if entrapment occurs.</p>		
	<p>No significant long-term distribution impacts to inshore dolphins.</p>	<p>Ensure suitably trained Marine Fauna Observers for the construction activities (piling, rock wall placement) to undertake visual observation of inshore dolphins around construction fronts.</p> <p>Cease all relevant activities (rock wall placement, vessel movement) if inshore dolphins enter exclusion zones as specified in the MEMP (POT 2135) to avoid injury or loss of inshore dolphins.</p>	<p>100% of personnel undertaking marine fauna observations are suitably trained.</p> <p>Construction works are ceased on 100% of occasions when inshore dolphins are observed within the relevant exclusion zone.</p> <p>No marine megafauna stranding reports (for inshore dolphins) associated with rock wall construction activities.</p> <p>Daily fauna logs maintained by marine megafauna observers.</p>	<p>Non-conformance identified from audits relating to marine fauna observation.</p> <p>Any change in marine megafauna diversity or distribution in known habitat areas.</p> <p>Any reported marine megafauna stranding or deaths in Cleveland Bay.</p> <p>Any injured marine megafauna in the vicinity of the rock wall construction activities</p>	<p>Refresher training for fauna observers.</p> <p>Number of fauna observation audits increased to ensure no further non-conformances.</p> <p>Investigate marine megafauna stranding's to determine cause.</p> <p>Attend Toolbox meetings with construction contractors.</p> <p>Consultation with ITAC / Department.</p>

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		<p>Works do not commence until any inshore dolphins have exited the exclusion zone, or a period of 30 minutes has elapsed since the last sighting of the animal in the exclusion zone.</p> <p>Regular reviews / audits undertaken for marine fauna observers.</p>	<p>Daily fauna logs audited by POTL regularly.</p> <p>No complaints received in relation to impacts to inshore dolphins from rock wall construction activities.</p>	<p>Cleveland Bay ambient water quality data indicates pre-cursor concerns for inshore dolphin abundance and health.</p> <p>Any reduction in the sightings of inshore dolphins in Cleveland Bay.</p>	
	All reclamation works are kept within the boundary of the approved area.	<p>Reclamation footprint restricted to location and size as per EPBC Act approval 2011-5979.</p> <p>Reclamation works will be spatially/cadastral surveyed to ensure works remain within the approved reclamation footprint (under the Reclamation Integrity Plan within the CEMP POT 2099).</p>	<p>100% of reclamation works are kept within the boundary of the approved area.</p> <p>All rock wall position assessments under the Reclamation Integrity Plan confirm rock wall rocks are within the development footprint.</p>	<p>Rock quantities not matching those expected.</p> <p>Routine on site audits identifies a potential deviation in rockwall construction alignment</p> <p>Contractor Toolbox meetings identifies concerns with placement or construction methodologies.</p>	<p>Revisit the construction methodology.</p> <p>Increase frequency of surveys.</p> <p>Identification and removal of any rocks or structures outside of the development footprint</p> <p>Escalation through contractual process.</p>
	No significant long-term behavioural impacts to marine megafauna from construction activities.	Suitably trained Marine Fauna Observers undertake visual observation of marine megafauna around active construction fronts and vessel movements.	<p>100% of personnel undertaking marine fauna observations are suitably trained.</p> <p>Underwater noise assessments confirm the exclusion zones being implemented are appropriate.</p>	<p>Rock wall Construction works or Piling do not cease when marine megafauna are observed in the exclusion zone.</p> <p>Any change in dolphin behaviour and/or reduced</p>	<p>Confirm reasons for decreasing trend, additional survey is necessary.</p> <p>Consultation with ITAC / Department.</p>

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		<p>Activity ceased for rock wall construction activities if marine fauna enter the exclusion zones as specified in the MEMP (POT 2135).</p> <p>Works do not commence until the marine megafauna has exited the exclusion zone, or a period of 30 minutes has elapsed since the last sighting of the animal in the exclusion zone</p> <p>Consider noise mitigation when operating construction plant and equipment.</p> <p>Active awareness maintained of marine megafauna throughout daily construction activities, including within the exclusion zone.</p> <p>Underwater noise monitoring for rock dumping and piling noise.</p>	<p>Construction works are ceased on 100% of occasions when marine megafauna are observed within the relevant exclusion zone.</p> <p>Audits of marine fauna observers and pile driving procedure do not identify any non-conformances.</p> <p>Daily fauna logs maintained by marine megafauna observers.</p> <p>Daily fauna logs audited by POTL regularly.</p>	<p>presence in known habitat areas.</p> <p>Any reduction in the sightings of marine megafauna (turtles, dolphins) in Cleveland Bay.</p>	
<i>To avoid or minimise impacts to MNES by avoiding or minimising</i>	Discharges of pollution including waste, light, noise and hazardous materials are	<p>Only project required material is bought/retained onsite.</p> <p>All bins are fitted with secure lids to prevent waste</p>	Site inspections of waste storage containers result in 100% compliance with industry standards.	Marine debris monitoring shows an increase in volumes within Cleveland Bay.	Review site management practices and CEMP Maintain and repair any damage to storage areas and/or bunds promptly.

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<i>pollution of the marine environment.</i>	<p>avoided or minimised.</p> <p>Where discharges occur, these are controlled and minimised effectively.</p> <p>Where discharge-related impacts to megafauna/MNES are detected, they are reported in a timely manner to facilitate and inform appropriate responsive action.</p>	<p>material being blown into the marine environment during storage or handling.</p> <p>Storage areas include appropriate bunding to contain spillages in accordance with applicable standards and are covered to prevent stormwater/wave infiltration.</p> <p>Site specific emergency response procedures.</p> <p>Fuel / chemical storage is kept in a secure area, and banded to prevent spills.</p>	<p>Site inspections of on-site facilities result in 100% compliance of correct waste storage, handling, disposal and transporting standards.</p> <p>100% of fuel/chemical storage and hazardous material handling is compliant with appropriate standards.</p> <p>All spills reported and adequately contained and promptly cleaned up.</p>	<p>Any reported marine megafauna stranding or deaths in Cleveland Bay.</p> <p>Any injured marine megafauna in the vicinity of the rock wall construction activities</p> <p>Any reduction in the sightings of Marine megafauna (turtles, dolphins) in Cleveland Bay.</p> <p>Multiple minor spills occur on site.</p> <p>Non-conformances with on-site storage arrangements have been identified in three consecutive inspections/audits.</p> <p>Contractor toolbox meetings identifies waste management / storage issues or concerns.</p>	<p>Investigation any incidents relating to hazardous materials and/or fuel bunkering and undertake appropriate corrective or remedial actions, as required to render the area safe and avoid or minimise environmental harm.</p> <p>Review procedures, if procedures breakdown or a spill occurs and train staff about appropriate responses.</p>
<i>To avoid and minimise impacts to MNES by managing risks</i>	Risks to megafauna/MNES that may result from the effects of extreme weather	<p>Implement POTL Cyclone Response Plan.</p> <p>Implement Site Cyclone plan which includes ceasing</p>	Conduct monitoring and observation of weather conditions and alerts relevant to the site, including extreme weather events.	Monitor the Bureau of Meteorology Tropical Cyclone for warning.	Revisit construction timeframe and planning should impact to the construction work fronts

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<p><i>associated with extreme weather events to construction activities.</i></p>	<p>events on construction activities, are identified.</p> <p>Identified risks are assessed and managed where reasonable and practicable.</p> <p>Where risks are realised, impacts to megafauna/MNES are reported in a timely manner to facilitate appropriate responsive action.</p>	<p>operation of the construction site and relocation of equipment to a safe location in the event of extreme weather conditions (e.g. cyclone).</p> <p>Schedule key construction activities to commence and be mostly completed in dry seasons where risk of severe weather is reduced.</p> <p>Work Schedule incorporates contingency to minimise the time the core rock is exposed (i.e. not covered by armour rock) during the North Queensland Wet season.</p> <p>Follow the Reclamation Integrity Plan for severe weather contingency arrangements to minimise impact.</p> <p>Key construction fronts designed to accommodate and withstand standard severe weather events.</p>	<p>POTL Cyclone emergency response procedure implementation and 100% of CU Project related actions completed (Condition Green – 1 November).</p> <p>POTL Cyclone emergency response procedure implementation and 100% of CU Project related actions completed (Condition Yellow – Intensifying risk of cyclone).</p>	<p>Project contractors do not enact cyclone response actions as per POTL cyclone procedures.</p> <p>Monitor the Townsville Regional Harbour Master, and Local Disaster Management Group alerts for disaster alert activation.</p> <p>Construction program deviates from construction schedule</p> <p>When safe to do so after an event, undertaken stormwater monitoring to identify any pre-cursor to impact.</p>	<p>occur as a result of extreme weather events.</p> <p>Revise construction sequence and armouring should impact to the construction work fronts occur as a result of extreme weather events.</p> <p>Review the POTL Cyclone Response Plan</p> <p>Attend Construction Toolbox meetings for Learning Moments and Improvements.</p> <p>After impact, assess impact to the site and construction fronts (when safe to do so) e.g.</p> <ul style="list-style-type: none"> - Reinstating any rocks moved from approved placement area, including retrieving any rocks outside the approved footprint. - Reinstalling stormwater treatment (as per stormwater, sediment, and erosion control plan).

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	Identify and report natural/non-project related impacts to MNES from extreme weather events (e.g. flood impacts, bleaching events).	Fully implement the scientifically robust monitoring programs for key aspects (inshore dolphins, seagrass, coral and marine water), including the use of baseline and reference site. Regular reporting from monitoring programs ITAC to review and provide advice on data from monitoring programs and ITAC members expert knowledge	100% of instances are communicated / referred to ITAC. 100% of monitoring programs undertaken.	GBRMPA water quality data indicate change; Reef Outlook report identifies local or regional shifts; Healthy Reef updates identify concerns; Any reported marine megafauna stranding or deaths in Cleveland Bay. Any injured marine megafauna in the vicinity of the rock wall construction activities ITAC Specialist identifies changes in their field; Any impacts to the nature and distribution of seagrass in Cleveland Bay other than EPBC Act approved.	On advice from the ITAC: - Undertake additional or reactive Monitoring, - Review Trigger Levels, - Review monitoring plans, Report findings to the relevant Departments.
<i>Avoid vessel accidents and oil spills from vessels associated with the action;</i>	No injury or fatality to marine megafauna because of project vessel operations.	All vessel masters and crew associated with the rock wall construction activities are trained in marine megafauna observation and mitigation techniques.	100% of personnel undertaking marine fauna observations undertake marine megafauna awareness training, incorporating observation and mitigation techniques.	Small vessels do not respond as per vessel response procedures when marine megafauna are observed.	Refresher training for fauna observers. Review of onboarding process / training matrix.

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Objective	Performance Criteria	Controls	Performance Indicators	Early-warning trigger levels	Corrective Actions
	Where detected, impacts to megafauna/MNES from project vessels, including spills, are reported in a timely manner to facilitate appropriate responsive action.	<p>Implement marine megafauna observation and response procedures, including:</p> <ul style="list-style-type: none"> - Maintaining a lookout for cetaceans and turtles while small vessels are operating; - Adjusting vessel speed and direction, within the safety constraints of the vessel, to avoid impact on the observed individuals in the event that megafauna is sighted, including remaining greater than 150m from dolphins, turtles and dugongs, and 300m from whales. <p>Enforce vessel speed limits where appropriate (i.e. less than 6 knots in waters less than 2.5m depth or within 50m of shoreline) to reduce potential for marine megafauna collision.</p> <p>Implement the approved Construction Vessel traffic management plan for rock wall construction.</p>	<p>Marine megafauna (dolphins, dugongs and turtles) observation and vessel response procedures are implemented on 100% of occasions when marine megafauna are observed.</p> <p>Daily marine megafauna observation logs are maintained by vessel masters.</p> <p>Daily fauna logs audited by POTL regularly.</p> <p>No complaints received in relation to rockwall construction vessels impacts on marine megafauna.</p> <p>No marine megafauna stranding reports associated with rock wall construction vessels.</p>	<p>Change in site personnel involved in activities that require marine fauna observation.</p> <p>Daily fauna logs missing or not present for all days of operation.</p> <p>Non-conformance identified from audits relating to marine fauna observation.</p> <p>Any reported marine megafauna stranding or deaths in Cleveland Bay.</p> <p>Any injured marine megafauna in the vicinity of the rock wall construction activities</p>	<p>Increase frequency of audits undertaken on Marine fauna observations to ensure no further non-conformances.</p> <p>Attend Toolbox meetings with construction contractors.</p> <p>Escalation through contractual process if consecutive CAR / non-conformances raised relating to marine fauna observation.</p>

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Objective	Performance Criteria	Controls	Performance Indicators	Early-warning trigger levels	Corrective Actions
		Limit vessel usage near sensitive habitat areas to prevent disturbance to sensitive receptors.			
	No marine water contamination from leaks and spills on-board vessels.	<p>Maintain an appropriate spill kit, personal protective equipment and relevant operator instructions / emergency procedures for the management of hazardous materials, fuel and chemicals on all vessels.</p> <p>Spills response procedures are implemented.</p> <p>Conduct plant and equipment maintenance and refuelling only in designated areas.</p> <p>Fuel / chemical storage is kept in a secure area and bunded on board vessels to prevent spills.</p>	<p>Vessel inspections result in 100% compliance of hazardous waste storage containers meeting industry standards.</p> <p>Vessel inspections result in 100% compliance for fuel transferring and equipment meeting industry standards.</p> <p>All spills are self-reported to POTL, and effectively contained and cleaned up.</p>	<p>Non-conformances with on-site storage arrangements have been identified.</p> <p>Non-conformances with fuel transferring equipment and procedure are identified.</p> <p>Small volume spills or spills that do not reach marine water occur on multiple occasions.</p>	<p>Improvement in Management practices (rubbish, sediment, chemical storage).</p> <p>Maintain and repair any damage to storage areas and/or bunds promptly.</p> <p>Review fuelling practices and rectify immediately if an unintentional release or spill occurs.</p> <p>Attend Toolbox meetings with construction contractors</p> <p>Increase frequency of audits undertaken on vessels to ensure no further non-conformances.</p> <p>Review procedures, if procedures breakdown or a spill occurs and train staff about appropriate responses.</p>

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Inshore Dolphin Monitoring Program:

Objective	Performance Criteria	Controls	Performance Indicators	Early Warning Trigger levels	Corrective Actions
<p><i>Provide for the identification of residual adverse impacts to listed dolphin species in Cleveland Bay, in cases where impacts cannot be managed</i></p>	<p>Inshore dolphin populations in Cleveland Bay are monitored to measure and detect trends and changes to the population and behaviour.</p>	<p>Fully implement scientifically robust inshore dolphin monitoring programs, including the use of pre construction and far field reference site, to identify project related impacts.</p> <p>Engage ITAC with inshore dolphin monitoring results, including Temporal and Spatial data, for review.</p>	<p>100% of data, annual and final reports and datasets/spatial layers, supplied by agreed milestone dates each year following data analysis</p> <p>100% of all surveys at the identified periods are undertaking at the scheduled time.</p> <p>Undertake Annual Program Review to identify trends and areas of potential concern to ensure all appropriate management controls or mitigations implemented</p>	<p>Surveys delayed due to weather</p> <p>Any reported dolphin stranding or deaths in Cleveland Bay.</p> <p>Any injured dolphin in the vicinity of the rock wall construction activities</p> <p>Any change in dolphin behaviour, diversity or distribution in known habitat areas</p>	<p>Undertake follow up surveys as soon as practical (if possible)</p> <p>Review monitoring plans and reschedule survey accordingly. Escalation through contractual process if consecutive CAR / non conformances raised relating to marine fauna observation</p>
	<p>No significant long term distribution impacts to inshore dolphins</p>	<p>Ensure suitably trained Marine Fauna Observers for the construction activities (piling, rock wall placement) to undertake visual observation of inshore dolphins around construction fronts.</p> <p>Cease all relevant activities (rock wall placement, vessel movement) if inshore dolphins enter exclusion zones as specified in the MEMP (POT 2135) to avoid injury or loss of inshore dolphins.</p>	<p>100% of personnel undertaking marine fauna observations are suitably trained.</p> <p>Construction works are ceased on 100% of occasions when inshore dolphins are observed within the relevant exclusion zone.</p> <p>No marine megafauna stranding reports (for inshore dolphins) associated with rock wall construction activities.</p> <p>Daily megafauna logs maintained by marine fauna observers</p>	<p>Non conformance identified from audits relating to marine fauna observation</p> <p>Any change in dolphin diversity or distribution in known habitat areas.</p> <p>Any reported dolphin stranding or deaths in Cleveland Bay.</p> <p>Any injured dolphins in the vicinity of the rock wall construction activities</p>	<p>Refresher training for fauna observers.</p> <p>Number of fauna observation audits increased to ensure no further non-conformances.</p> <p>Investigate marine megafauna stranding's to determine cause, location</p> <p>Attend Toolbox meetings with construction contractors</p> <p>Investigate ambient water quality information, with input</p>

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Objective	Performance Criteria	Controls	Performance Indicators	Early Warning Trigger levels	Corrective Actions
		Works do not commence until any inshore dolphins have exited the exclusion zone, or a period of 30 minutes has elapsed since the last sighting of the animal in the exclusion zone.	Daily fauna logs audited by POTL regularly No complaints received in relation to impacts to inshore dolphins from rock wall construction activities.	Cleveland Bay ambient water quality data indicates precursor concerns for inshore dolphin abundance and health Any reduction in recorded sightings of inshore dolphins in Cleveland Bay	from the ITAC, to determine possible flow on impact on inshore dolphins

Environmental Procedure for Piling:

Objective	Performance Criteria	Controls	Performance Indicators	Early-warning trigger levels	Corrective Actions
<i>To minimise the risk of physiological impacts to marine fauna from pile driving operations</i>	No significant long-term behavioural impacts to megafauna from piling activities No injury or loss of marine megafauna due to noise or vibration from reclamation or piling activities	Establish an exclusion zone, based on noise modelling and relevant scientific evidence, to minimise the risk of physiological impacts to marine fauna from pile driving operations. Implement the Environmental Procedure for Pile Driving for all piling works. Ensure suitably trained, dedicated Marine Fauna Observers for the piling activities to undertake visual observation of marine megafauna	Undertake initial underwater noise monitoring at the commencement of piling to validate the exclusion zone implemented. Inspections/audits are undertaken to identify the need for noise and vibration suppression measures and the effectiveness of measures implemented. Underwater noise assessments confirm the exclusion zone for piling being implemented is appropriate.	Marine fauna observer for piling activities identified to have been assigned additional tasks/not fully dedicated. Non conformance identified from audits relating to marine fauna observation Daily fauna logs missing or not present for all days of operation Any reduction in marine megafauna sightings (turtles, dolphins) in Cleveland Bay.	Revisit the piling methodology, including monitoring and adjusting elements of piling such as reducing the height and weight of the impact hammer. Consultation with ITAC / Department Review observation zones, exclusion zones based on Underwater noise assessments and provide recommendation to ITAC Refresher training for fauna observers.

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Objective	Performance Criteria	Controls	Performance Indicators	Early-warning trigger levels	Corrective Actions
		<p>Ensuring pre-start visual observations for marine megafauna are undertaken across the observation zone by a suitably qualified marine observer for at least 30 mins prior to commencement of pile driving operations, and during pile driving operations.</p> <p>Only commence pile driving operations if marine megafauna have not been sighted in the exclusion zone for 30 mins;</p> <p>Ceasing pile driving operations if marine megafauna are observed in, or about to enter, the exclusion zone;</p> <p>Not commencing pile driving operations between the hours of sunset and sunrise. Pile driving that has commenced before sunset (or a period of low visibility) may continue after sunset, unless pile driving operations have been suspended for more than 15 minutes.</p>	<p>100% of personnel undertaking marine megafauna observations are suitably trained.</p> <p>Dedicated marine fauna observers are in place for 100% of piling activities.</p> <p>Piling works are ceased on 100% of occasions when marine megafauna are observed within the exclusion zone.</p> <p>Pile driving procedure implemented 100% of the time.</p> <p>Daily fauna logs maintained by marine fauna observers</p> <p>Daily fauna logs audited by POTL regularly</p>	<p>Any reported marine megafauna stranding or deaths in Cleveland Bay.</p> <p>Any injured marine megafauna in the vicinity of the piling construction activities</p> <p>Any change in dolphin behaviour and/or reduced presence in known habitat areas</p>	<p>Increase frequency of audits undertaken on Marine fauna observations to ensure no further non-conformances.</p> <p>Attendance Toolbox meetings with construction contractors</p> <p>Escalation through contractual process if consecutive CAR / non conformances raised relating to marine fauna observation</p>

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8. MONITORING PROGRAMS RELEVANT TO MNES

A number of monitoring programs are required under the EPBC Act approval (EPBC 2011/5979) to support the measurement and management of potential impacts on a number of MNES. This section provides a summary overview of the key monitoring programs being implemented for the CU Project.

8.1. Inshore Dolphin Monitoring Plan

POTL has established an Inshore Dolphin Monitoring Program to support the CU Project. The objectives of the Inshore Dolphin Monitoring Plan are to:

- To provides consistent and scientifically valid monitoring methodologies to be able to determine trends and identification of stressors with the potential to cause adverse impacts for these species as consistent with the *Coordinated National Research Framework to Inform the Conservation and Management of Australia's Tropical Inshore Dolphins* (Department of the Environment, 2015).
- Provide a baseline assessment on the distribution, abundance and habitat use of the Australian snubfin dolphin and Australian humpback dolphin species in areas of Cleveland Bay that may be directly or indirectly impacted by the CU Project and adjacent non-impacted sites.
- Monitor and report on changes, beyond natural spatial and temporal variation, to the population and behaviour of the Australian snubfin dolphin and Australian humpback dolphin species throughout construction, pile driving operations and dredging activities for the CU Project, and a sufficient period of time post-construction to identify any changes in population and behaviour of the identified dolphin species as a result of the said activities.
- Provide recommendations on key areas of adverse impact and potential mitigation measures, including the identification of residual adverse impacts in Cleveland Bay which cannot be managed.

This monitoring plan has been established and a copy of the Inshore Dolphin Monitoring Plan is at Appendix F.

8.2. Marine Megafauna Monitoring Plan

POTL has established a Marine Megafauna Monitoring Plan to support the CU Project. As specified in the EPBC Act approval, this plan is focused specifically on Listed Turtle Species, Dugong (*Dugong dugon*), and all other cetaceans. Inshore Dolphins are not a focus of this plan given they are subject to a specific plan.

The overarching objective of the Marine Megafauna Monitoring Plan is to monitor for, and provide increased understanding of, potential impacts to marine megafauna from marine activities associated with marine construction and dredging.

The Marine Megafauna Monitoring Plan will fulfil this by:

- Providing an understanding of the pre-construction conditions, depending on natural abundance of each species, of selected aspects of marine megafauna and their key habitats prior to commencement of Project activities;
- Identifying potential impacts from construction activities and provide a framework for increasing understanding of the magnitude of these potential impacts, and in particular, whether activities are being undertaken within approved impact limits (i.e. confirm EIS predictions of potential impacts);

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- Monitoring and reporting on selected aspects of marine megafauna, during construction activities in the marine environment, to provide an increased understanding of the marine megafauna response to potential impact pathways,
- Providing recommendations on key areas of potential impact to allow the implementation of mitigation measures, if impacts are beyond what was predicted in the EIS (approved);
- Increasing understanding and scientific knowledge of marine megafauna within Cleveland Bay (where relevant).

This monitoring plan has been established and a copy of the Marine Megafauna Monitoring Plan is at Appendix G.

8.3. Shorebird Monitoring Plan

POTL has established a Shorebird Monitoring Plan to support the CU Project. The objectives of the Shorebird Monitoring Plan are to:

- Develop a Shorebird Monitoring Program to monitor potential impacts to shorebirds before and during construction activities.
- Conduct a pre- CU Project construction activities survey of shorebirds in the Project area and on the nearby Ross River sandspit to identify and record the abundance of each bird species.
- Monitor and report on changes to shorebird roosting and foraging, beyond natural spatial and temporal variation, during the Project construction activities in the marine environment, to identify any impacts from the project on shorebirds.
- Provide recommendations on key areas of actual impact and potential mitigation measures should impacts be detected.
- Contribute to improving public awareness on local avifauna biodiversity and species richness in the vicinity of the project area.

This monitoring plan has been established and a copy of the Shorebird Monitoring Plan is at Appendix H.

8.4. Invasive Marine Pests Monitoring Plan

POTL is currently developing an invasive marine species monitoring plan for whole of Port invasive marine pest monitoring, based on nationally agreed methodologies and standards and pilot project documentation that is being developed by the Queensland Government Department of Agriculture and Fisheries (DAF). This program will be focused on detecting the presence of invasive marine species.

The CU Project Invasive Marine Pest Monitoring Plan, given the pests are associated with dredging and dredging equipment only, will be developed as part of the management arrangements for the dredging component of the project. This will also align with the timing for finalisation of the whole of port invasive marine pest monitoring plan. The Invasive Marine Pest Monitoring Plan will be based on nationally agreed methodologies and standards, such as the Australian Marine Pest Monitoring Manual (version 2.0, 2010).

Future versions of this MEMP will incorporate the Invasive Marine Pest Monitoring Plan, which will be provided at Appendix I.

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8.5. Environmental Procedure for Pile Driving

POTL will establish an Environmental Procedure for Pile Driving to specifically address establishing adequate controls to monitoring and mitigate impacts associated with pile driving. This will include monitoring and reporting by suitably qualified marine observers for megafauna presence prior to and during piling activities. Records will be kept of all observations of marine megafauna in association with the pile driving activities.

The draft Environmental Procedure for Pile Driving is included at Appendix J, and will be further refined and updated as part of the assessment works being undertaken to establish suitable observation and exclusion zones based on noise modelling and relevant scientific evidence.

8.6. Monitoring Plan reporting

Regular reporting and monitoring updates will be a key feature of the implementation of these monitoring plans. Contractors will be responsible for analysis of the monitoring data at defined intervals and providing interpretation of the monitoring results achieved and any areas of concern. This will include recommendations on likely causes/stressors, necessary management action/s or monitoring program modification should the monitoring data show concerns.

These interim monitoring reports will be considered by the CU Project team as part of the overall adaptive management of the project. As outlined in the relevant management plans, these reports will be a fundamental input to reviews of the relevant management arrangements and corrective actions.

The interim monitoring reports will also be presented to the POTL CU Project ITAC for review and consideration. Particularly where there are monitoring results indicating areas of concern or population impacts, the ITAC will consider the results against trigger levels and other legislative criteria and provide advice to POTL CU Project team on the most appropriate response strategies or evaluate the corrective actions proposed to be implemented. The ITAC advice will further contribute to POTL revision of the relevant management controls and corrective actions to minimise impact on the relevant aspect of the marine environment and will be communicated to the regulatory oversight committee (CROC) and/or regulatory bodies as appropriate.

All changes to management arrangements as a result of these monitoring programs will be captured and documented within the relevant management plans, including reference in this MEMP, and the varied management arrangement incorporated into the on ground practices.

Copies of all report(s) will be kept on-site and will be available for regulatory inspection. If requested by the regulators, all survey data and information will be submitted within 30 business days of the request, or within a timeframe agreed by the relevant regulator in writing.

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9. CONTINGENCY PLANS

As part of its Quality Management System, POTL has established contingency and emergency response plans for a range of emergency and incidents, including marine and land incidents and natural disasters. Relevant considerations and contingency plans associated with the project are incorporated into these broader POTL contingency and emergency response plans. Additionally, a number of the CU Project specific operational management plans address specific contingency procedures for identified emergencies / incidents where they have been identified as key requirement. Table 7 details the contingency plans in place for the CU Project.

Table 7: CU Project Contingency Plan

Contingency	Response	Responsibility	Timeframe
Cyclone or other extreme weather event	Implement POTL Cyclone Response Plan which details POTL’s authorities and responsibilities for the management of infrastructure, vessels, port users, tenants and personnel during a cyclone or other extreme weather event. This plan establishes clear actions and steps to be taken in the preparation for, response to and recovery from a cyclone event for the Port of Townsville. Specific requirements for the CU Project equipment, including monitoring equipment deployed as part of the project, will be incorporated into this document. In addition, the RHM has established requirements for all vessels in the event of a cyclone that will be applicable to any construction and reclamation vessels.	Project Director CU	As detailed in the cyclone readiness chart
Breach in reclamation structure	Implement CU Reclamation Integrity Management Plan	Project Director CU	Immediately
Securing of water management systems in the event of extreme (severe) weather forecast	Implementation of the CU Tailwater Management Plan and the Stormwater and Erosion Control Plan; including preparatory maintenance of management systems and drains prior to wet season commencement, Water management systems (bunds, stormwater drains) will be fit for purpose designed to withstand moderate weather conditions.	Project Director CU	Prior to extreme (severe) weather (where possible)
Equipment falls into water	Implement Safe Work Methods as detailed in Project specific Safe Work Method Statements for rock wall construction/ reclamation activities.	Contractor	Immediately
Uncontrolled tailwater release	Implement mitigation actions in Tailwater Management Plan	Manager Environment CU	Immediately
Marine megafauna incident	In all situations, should a marine megafauna interaction or incident occur, the activity will be ceased while the	Contractor / Project Director CU /	Immediately

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Contingency	Response	Responsibility	Timeframe
	<p>animal and its injuries are assessed. Where it is safe to do, reasonable efforts will be made by the construction and reclamation crews to assist any marine megafauna following any incident.</p> <p>An incident report will be completed, with corrective actions to be considered and implemented to minimise the risk of the incident being repeated.</p> <p>All interactions will be recorded and reported immediately.</p>	Manager Environment CU	
<p>Non-CU Project related impacts on MNES (Given the length of this project, it is possible an environmental incident or impact on MNES could occur that is not directly associated with the project activities (i.e. megafauna mortality, seagrass dieback from a cyclone event etc)</p>	<p>In the event of such a non-project related incident, POTL will discuss these impacts within the core and project teams, with the POTL ITAC and other relevant parties (i.e. monitoring contractors) to review known information of the cause and extent of the incident and impact. As part of the adaptive management of the project, consideration will be made of any relevant modifications that could be made to the project activities which may assist in minimising the pressure on and providing significant improvement to the recovery and response of the relevant MNES.</p> <p>Any changes to the project activities to address non-project impacts will have a financial or program impact to the project. Should such changes be proposed, POTL will engage with the relevant regulators prior to making changes to discuss the proposed changes and the likely benefits to be achieved</p>	POTL Environmental & Planning Team	To be determined according to the nature of the incident / impact

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APPENDIX A

Commonwealth & State Legislation

Level	Title	Relevance
Commonwealth	<i>Aboriginal and Torres Strait Islander Heritage Protection Act 1984</i>	Regulates the preservation and protection against desecration of areas and objects that are of Aboriginal or Torres Strait Island significance.
	<i>Biosecurity Act 2015</i>	Manages biosecurity threats to plant, animal and human health.
	<i>Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)</i>	Protects and manages nationally significant environmental and heritage matters, including the Great Barrier Reef World Heritage Area.
	<i>Great Barrier Reef Marine Park Act 1975 and regulations / zoning plans</i>	Establishes a framework for the establishment, control, management and development of the Great Barrier Reef Marine Park Authority.
	<i>Maritime Transport and Offshore Facilities Security Act 2003</i>	Establishes a requirement for maritime security plans for certain port facilities, including the Port of Townsville, which establish security zones and access procedures.
	<i>Native Title Act 1993</i>	Requires native title notification to undertake works, including the use of Unallocated State Land.
	<i>Protection of the Sea (Prevention of Pollution from Ships) Act 1983</i>	Regulates the prevention of accidental and operational marine environment pollution from shipping.
State	<i>Aboriginal Cultural Heritage Act 2003</i>	Establishes a duty of care to take all reasonable and practicable measures to ensure activities do not harm Aboriginal cultural heritage.
	<i>Coastal Protection and Management Act 1995</i>	Provides the framework for integrated management of the coastal zone, including the assessment and approval of tidal works structures and operational works under tidal water. All methods of land placement of dredge material remove sediments from the active marine system and consequently are assessed in the light of coastal processes and management requirements.
	<i>Environmental Protection Act 1994 and regulations / policies</i>	Regulates relevant environmental approvals and development approvals, including for dredging-related operations and general environmental protection requirements.
	<i>Fisheries Act 1994 and regulations</i>	Protects commercial and recreational fisheries resources and their habitats, including assessment and approval of disturbance or removal of protected marine and tidal plant species, including seagrasses, mangroves and salt-marsh from the Queensland Department of Agriculture, Fisheries and Forestry. It also prohibits work in a declared Fish Habitat Area without approval and declares Dugong Protection Areas. A declared Fish Habitat Area (Cleveland Bay FHA-071) exists within Townsville port limits but outside the dredge areas and Dredge Material Placement Areas. The whole of Cleveland Bay is a declared Dugong Protection Area.
	<i>Land Act 1994 / Land Title Act 1994</i>	Provides for the allocation of tenure over state land, including Unallocated State Land such as land below the high water mark where dredging occurs.

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Level	Title	Relevance
	<i>Marine Parks Act 2004</i> and <i>Marine Parks (Great Barrier Reef) Zoning Plan</i>	Provides for the State’s management of the coastal marine area along the Great Barrier Reef coast, including the state marine park.
	<i>Native Title (Qld) Act 1993</i>	Requires native title notification to undertake works, including the use of Unallocated State Land.
State	<i>Nature Conservation Act 1992</i>	Declares and manages protected areas, including the Great Barrier Reef World Heritage Area and provides for the protection of certain flora and fauna.
	<i>Planning Act 2016</i> and the <i>State Planning Policy</i> and assessment provisions	Requires certain developments within the port limits to be assessed for their environment effects and to be approved through the associated State Assessment and Referral Agency system.
	<i>Queensland Heritage Act 1992</i>	Provides for the conservation of Queensland’s historical cultural heritage.
	<i>State Development and Public Works Organisation Act 1971</i>	Defines “significant projects” as coordinated projects and allows the Coordinator General to decide whether such projects require a formal EIS or a more simplified Impact Assessment Report.
	<i>Sustainable Ports Development Act 2015</i>	Aims to provide for the protection of the Great Barrier Reef World Heritage Area, through management port-related development in and adjacent to the area
	<i>Transport Infrastructure Act 1994</i>	Requires POTL to establish, manage and operate efficient port facilities and services, including the provision of safe navigational channels and to prepare land use plans for management and development in port areas.
	<i>Transport Operations (Marine Pollution) Act 1995</i>	Outlines the requirements for ship-sourced pollution management in Queensland.
	<i>Transport Operations (Marine Safety) Act 1994</i>	Regulates the operation of commercial vessels in Queensland waters.

Obligations under the Environmental Protection Act 1994

General Environmental Duty

Section 319 of the *Environmental Protection Act 1994* states that every person has a general environmental duty, which requires that a person must not carry out any activity that causes or is likely to cause environmental harm unless the person takes all reasonable and practicable measures to prevent or minimise the harm. The following must be considered when deciding measures to be taken to fulfil the general environmental duty:

- The nature of the harm or potential harm;
- The sensitivity of the receiving environment;
- The current state of technical knowledge for the activity;
- The likelihood of successful application of the different measures that might be taken; and
- The financial implications of the different measures as they would relate to the type of activity.

The general environmental duty is a defence to offences related to causing unlawful environmental harm. If defendants can show that the harm happened while a lawful activity, apart from this Act, was being carried out and they fulfilled their general environmental duty, then they cannot be found guilty of causing unlawful

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environmental harm. A person is not prosecuted for failing to fulfil their general environmental duty. However, an environmental protection order can be issued to secure compliance with the general environmental duty and if this is not complied with, the person can be prosecuted.

Duty to Notify

Section 320 of the *Environmental Protection Act 1994* states a person must report the event, no later than 24 hours after becoming aware of serious or material environmental harm being caused or threatened by an activity that they are involved in, unless the harm is authorised by the regulator. Failure to fulfil this duty to notify of environmental harm is an offence and can lead to prosecution.

Offence to Cause Serious or Material Environmental Harm

Sections 437 to 439 of the *Environmental Protection Act 1994* state that a person must not wilfully and/or unlawfully cause serious environmental harm or material environmental harm. Serious environmental harm is environmental harm (other than environmental nuisance):

- a) that is irreversible, of a high impact or widespread; or
- b) caused to:
 - (i) an area of high conservation value; or
 - (ii) an area of special significance, such as the Great Barrier Reef World Heritage Area; or
- c) that causes actual or potential loss or damage to property of an amount of, or amounts totalling, more than the threshold amount; or
- d) that results in costs of more than the threshold amount being incurred in taking appropriate action to:
 - (i) prevent or minimise the harm; and
 - (ii) rehabilitate or restore the environment to its condition before the harm.

Material environmental harm is environmental harm (other than environmental nuisance):

- a) that is not trivial or negligible in nature, extent or context; or
- b) that causes actual or potential loss or damage to property of an amount of, or amounts totalling, more than the threshold amount but less than the maximum amount; or
- c) that results in costs of more than the threshold amount but less than the maximum amount being incurred in taking appropriate action to:
 - (i) prevent or minimise the harm; and
 - (ii) rehabilitate or restore the environment to its condition before the harm.

Offence to Cause Environmental Nuisance

Section 440 of the *Environmental Protection Act 1994* states that that a person must not wilfully and/or unlawfully cause environmental nuisance. Environmental nuisance is unreasonable interference or likely interference with an environmental value caused by—

- a) aerosols, fumes, light, noise, odour, particles or smoke; or
- b) an unhealthy, offensive or unsightly condition because of contamination; or
- c) another way prescribed by regulation.

Offence to Contaminate Water

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Section 440ZG of the *Environmental Protection Act 1994* states that a person must not unlawfully deposit a prescribed water contaminant in waters or unlawfully release stormwater run-off into waters, including stormwater drains. Prescribed water contaminants include sand, soil, silt or mud and a contaminant which is likely to cause environmental harm if it enters waters.

Offence to Cause Environmental Harm or Nuisance with Contaminant

Section 443 of the *Environmental Protection Act 1994* states that a person must not cause or allow a contaminant to be placed in a position where it could reasonably be expected to cause serious or material environmental harm or to cause environmental nuisance. A contaminant can be:

- A gas, liquid or solid; or
- An odour; or
- An organism (whether alive or dead), including a virus; or
- Energy, including noise, heat, radioactivity and electromagnetic radiation; or
- A combination of contaminants.

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APPENDIX B

EPBC Approval Conditions Reference Table

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Marine Environmental Management Plan

MEMP relevant EPBC Approval Conditions

Ref	Cond. No.	Condition Requirement	Plan Reference	Demonstration of how the plan addresses the condition requirement
1	8	<p>The person taking the action must ensure that:</p> <ul style="list-style-type: none"> the reclamation area does not exceed 110 hectares at stage 1 of the action in accordance with Appendix 8; the reclamation area does not exceed 152 hectares in total, in accordance with Appendix C; and the design, materials and methods of construction for the reclamation area must prevent water quality impacts from leaching material through the bund wall, release of tailwater and storm-water run-off. 	6.4 6.5	Sections 6.4 and 6.5 (Marine Water and Sediment) address actions associated with impacts from the reclamation footprint and reclamation integrity. This includes tailwater monitoring to demonstrate prevention of water quality impacts from tailwater.
2	9	The person taking the action must ensure that a survey of the reclamation area in Appendix 8 is undertaken before the commencement of the action, and a survey of the final reclamation area shown in Appendix C is undertaken before the commencement of stage 2 of the action, to determine the presence and density of seagrass within the reclamation footprint.	6.4.2	Section 6.4.2 details the monitoring requirement to survey the reclamation area footprint for seagrass prior to commencement.
3	12	The person taking the action must submit a Marine Environmental Management Plan (MEMP) for the Minister's approval, which includes measures to mitigate impacts to MNES from activities in the marine environment, before the commencement of the action. The person taking the action must not commence the action unless the Minister has approved the MEMP. The MEMP must be prepared in accordance with the Department's Environmental Management Plan Guidelines, and include at least the following:	4.3 Document Control Sheet	<p>Section 4.3 and the document approval page details the submitting and approval of the MEMP to the Department.</p> <p>The action is not commenced until the MEMP is approved.</p>
4	12a)	<p>clearly defined objectives and performance criteria to:</p> <ul style="list-style-type: none"> avoid or minimise impacts to MNES from construction and operational activities in the marine environment; avoid or minimise pollution of the marine environment; manage risks associated with extreme weather events; and avoid vessel accidents and oil spills from vessels associated with the action; 	6	Section 6 details all environmental elements associated with the construction activities in the marine environment. Objectives and performance criteria for each element is detailed in the sub-sections.

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Ref	Cond. No.	Condition Requirement	Plan Reference	Demonstration of how the plan addresses the condition requirement
5	12b	specific and auditable mitigation and management measures to avoid and minimise impacts to MNES, including: controls, performance indicators, early-warning trigger levels, risk management, adaptive management strategies, corrective actions, and emergency response measures;	6	Section 6 details all environmental elements associated with the construction activities in the marine environment. All mitigation and management measures for each element detailed in the individual sub-sections
6	12c	mitigation and management measures to mitigate impacts from noise, artificial light, vessel strike, invasive marine species, vessel accidents, storm-water runoff, chemical and fuel management, and accidental release of waste and/or other contaminant spills into the marine environment;	6	Section 6 details mitigation and management measures for each of the elements specified in this condition, with details provided in the individual sub-sections
7	12d	a program to monitor the potential impacts to marine fauna before and during construction activities in the marine environment;	8.2 Appendix G	Section 8.2 and Appendix G provide details of the monitoring program to be implemented for monitoring of impacts to Marine Megafauna.
8	12e	a program to monitor the potential impacts to shorebirds before and during construction activities in the marine environment;	8.3 Appendix H	Section 8.3 and Appendix H provide details of the monitoring program to be implemented for monitoring of impacts to shorebirds.
9	12f	a program to monitor the Port Expansion Project area for the presence of invasive marine species. The invasive marine species monitoring program must be based on nationally agreed methodologies and standards (such as the Australian Marine Pest Monitoring Manual (version 2.0, 2010), as amended or substituted);	8.4; Appendix I	Section 8.4 and Appendix I provide details of the monitoring program to be implemented for monitoring the presence of invasive marine species.
10	12g	contingency plans should undesirable or unforeseen impacts occur, including as a result of extreme weather events or any additional pressures that may impact MNES;	9	Section 8 details contingency plans for key potential emergencies and incidents associated with activities in the marine environment that may increase the risk to MNES.
11	12h	mechanisms for the regular review of the performance of the MEMP in achieving its objectives and to support continuous improvement;	4.7 4.12	Section 4.7 and 4.12 outline the approach for regular review of the MEMP, including at least annual reviews and regular auditing.
12	12i	procedures for reporting to the Department on outcomes of monitoring, performance monitoring, and periodic reviews of the MEMP;	4.13	Section 4.13 outlines the approach for reporting to the Department on the outcomes of MEMP delivery, monitoring and reviews/auditing of the MEMP.

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Ref	Cond. No.	Condition Requirement	Plan Reference	Demonstration of how the plan addresses the condition requirement
13	12j	mechanisms for stakeholder consultation on the implementation of the MEMP; and	4.1 4.7 4.16	Section 4.1, 4.7 and 4.16 detail the consultation with stakeholders undertaken in the development of the MEMP, linking to stakeholder consultation/engagement mechanisms (Section 4.16) moving forwards.
14	12k	an outline of the governance structure, including roles and responsibilities for implementing the MEMP.	4; detailed in 4.5	Section 4, especially section 4.5 (Organisational structural and responsibilities) provides details of the internal POTL governance structure. This includes detailing the responsibilities of key roles with implementation of the MEMP.
15	13	The MEMP may be submitted to the Minister in stages, but the MEMP must be submitted before the commencement of each stage, and the respective stages must not commence until the Minister has approved the respective version of the MEMP.	1.1 0	Section 1.1 and 1.2 outline the approach of submitting the MEMP in stages, related to the relevant phase of construction activity.
16	14	The approved MEMP, or subsequent version of the MEMP as provided for under Condition 38, must be implemented.	4.4	Section 4.4 details the implementation of the MEMP and the responsibility for ensuring the MEMP actions are installed, taken and maintained.
17	15	The person taking the action must establish an exclusion zone to minimise the risk of physiological impacts to marine fauna from pile driving operations. The exclusion zone must be based on noise modelling and relevant scientific evidence. The exclusion zone must be peer reviewed by a suitably qualified independent expert and included in the MEMP required by Condition 12 and submitted for the Minister's approval. The person taking the action must not commence pile driving operations unless the Minister has approved the MEMP.	6.9.2 8.5 Appendix J	Sections 6.9.2 detail the management measures to address impacts from piling on MNES, particularly marine megafauna. Section 8.5 and Appendix J provide details of the Environmental Procedure for Pile Driving that incorporates the establishment of an Exclusion zone supported by scientific evidence.
18	16	The person taking the action must ensure that pre-start visual observations for marine fauna are undertaken across the entire observation zone. The visual observations must be undertaken by a suitably qualified marine observer for at least 30 minutes immediately preceding the commencement of pile driving operations, and during pile driving operations. Records must be kept of marine observers engaged for visual observations.	6.9.2 8.5 Appendix J	Sections 6.9.2 detail the management measures to address impacts from piling on MNES, particularly marine megafauna. Section 8.5 and Appendix J provide details of the Environmental Procedure for Pile Driving that incorporates the requirement for pre-start observations.

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Ref	Cond. No.	Condition Requirement	Plan Reference	Demonstration of how the plan addresses the condition requirement
19	17	The person taking the action can only commence pile driving operations if marine fauna have not been sighted within the exclusion zone at the completion of the 30 minute pre-start visual observations in Condition 16.	6.9.2 8.5 Appendix J	Sections 6.9.2 detail the management measures to address impacts from piling on MNES, particularly marine megafauna. Section 8.5 and Appendix J provide details of the Environmental Procedure for Pile Driving that incorporates the requirement to only commence once marine megafauna have not been sighted in the exclusion zone.
20	18	The person taking the action must initiate soft-start procedures at the commencement of pile driving operations, with a gradual increase in piling impact energy of no more than 50% of full impact energy for 10 minutes. The soft-start procedure must be implemented after breaks in piling of 30 minutes or more.	6.9.2 8.5 Appendix J	Sections 6.9.2 detail the management measures to address impacts from piling on MNES, particularly marine megafauna. Section 8.5 and Appendix J provide details of the Environmental Procedure for Pile Driving that incorporates soft start procedures at commencement/recommencement of piling.
21	19	The person taking the action must implement stand-by procedures if marine fauna are sighted within the observation zone during the soft-start or normal operation procedures. The operator of the piling equipment must be placed on stand-by to shutdown the piling equipment.	6.9.2 8.5 Appendix J	Sections 6.9.2 detail the management measures to address impacts from piling on MNES, particularly marine megafauna. Section 8.5 and Appendix J provide details of the Environmental Procedure for Pile Driving that incorporates stand by procedures if marine megafauna are sighted in the observation zone.
22	20	The person taking the action must cease pile driving operations if marine fauna are observed in, or about to enter the exclusion zone. Pile driving operations must not commence again until all marine fauna are observed to move outside the exclusion zone and 30 minutes have passed since the last sighting of the marine fauna within the exclusion zone.	6.9.2 8.5 Appendix J	Sections 6.9.2 detail the management measures to address impacts from piling on MNES, particularly marine megafauna. Section 8.5 and Appendix J provide details of the Environmental Procedure for Pile Driving that incorporates cessation of piling where marine megafauna are sighted in, or about to enter, the exclusion zone.
23	21	The person taking the action must not commence pile driving operations between the hours of sunset and sunrise. Pile driving operations commenced before sunset or before a period of low visibility may continue between the hours of sunset and sunrise, unless pile driving operations have been suspended for more than 15 minutes.	6.9.2 8.5 Appendix J	Sections 6.9.2 detail the management measures to address impacts from piling on MNES, particularly marine megafauna. Section 8.5 and Appendix J provide details of the Environmental Procedure for Pile Driving that incorporates the requirement for piling not to occur between sunset and sunrise

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Marine Environmental Management Plan

Ref	Cond. No.	Condition Requirement	Plan Reference	Demonstration of how the plan addresses the condition requirement
24	22	The person taking the action must also apply Conditions 16, 17, 19, 20 and 21 to re-strike testing activities. A maximum of 15 full force blows of the pile hammer may be applied to each test pile on a maximum of two re-strike test events per test pile.	6.9.2 8.5 Appendix J	Sections 6.9.2 detail the management measures to address impacts from piling on MNES, particularly marine megafauna. Section 8.5 and Appendix J provide details of the Environmental Procedure for Pile Driving that incorporates the arrangements for re-strike testing activities.
25	23	The person taking the action may undertake an alternate procedure to Conditions 15 — 22, if the alternate procedure provides equivalent or better protection to marine fauna from pile driving operations. The alternate procedure must be outlined in the MEMP, peer reviewed by a suitably qualified independent expert, and submitted for the Minister's approval. The person taking the action must not commence pile driving operations unless the Minister has approved the MEMP, outlining the alternate procedures in accordance with this Condition.	6.9.2 8.5 Appendix J	Sections 6.9.2 detail the management measures to address impacts from piling on MNES, particularly marine megafauna. Section 8.5 and Appendix J provide details of the Environmental Procedure for Pile Driving that identifies the requirements to be followed if an alternate piling procedure is to be undertaken.
26	25	The person taking the action must provide an opportunity for Indigenous people to comment on the management plans and strategies specified in this approval during their preparation. The person taking the action must provide to the Minister a copy of the outcomes of consultation with Indigenous people, and an explanation of how any comments have been addressed in the management plans and strategies.	4.1 4.16	Section 4.1 and 4.16 detail the consultation with indigenous stakeholders undertaken in the development of the MEMP, linking to stakeholder consultation/engagement mechanisms (Section 4.16) moving forwards.
27	31	Unless otherwise agreed in writing by the Minister, each plan or strategy specified in the conditions must be independently peer reviewed before submission to the Minister for approval.	4.2	Section 4.2 details the peer review undertaken for the MEMP and associated sub-plans.
28	32	The reviews undertaken for Condition 31 must include an analysis of the effectiveness of the avoidance and mitigation measures in meeting the outcomes, targets or management measures identified in the plan/s or strategies being reviewed.	4.2	Section 4.2 details the peer review undertaken for the MEMP and associated sub-plans.
29	33	Unless otherwise specified in these conditions or notified in writing by the Minister, the person taking the action must provide to the Minister a copy of all advice and recommendations made by the independent peer reviewer(s) with the plan or strategy, and an explanation of how the advice and	4.2	Section 4.2 details the peer review undertaken for the MEMP and associated sub-plans.

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Marine Environmental Management Plan

Ref	Cond. No.	Condition Requirement	Plan Reference	Demonstration of how the plan addresses the condition requirement
		recommendations will be implemented, or an explanation of why the person taking the action does not propose to implement certain recommendations.		The peer review comments and POTL advice and response has been supplied to the Department as part of the Management Plan approval process.
30	35	The person taking the action must maintain accurate records substantiating all activities associated with, or relevant to, the conditions of approval, including measures taken to implement the management plans and strategy required by this approval, and make them available upon request to the Department. Such records may be subject to audit by the Department or an independent auditor in accordance with section 458 of the EPBC Act, or used to verify compliance with the conditions of approval. Note: Summaries of audits will be posted on the Department's website. The results of audits may also be publicised through the general media."	4.14	Section 4.14 outlines the records management system in operation for the CU Project in line with the POTL Quality Management System.
31	36	Within three months of every 12 month anniversary of the commencement of the action, the person taking the action must publish a report on their website addressing compliance with each of the conditions of this approval, including implementation of any management plans as specified in the conditions. Documentary evidence providing proof of the date of publication and non-compliance with any of the conditions of this approval must be provided to the Department at the same time as the compliance report is published.	4.13	Section 4.13 details the annual reporting for the project, covering a compliance review against the Approval conditions, outcomes of environmental monitoring and MEMP periodic review results.
32	38	The person taking the action may choose to revise a management plan approved by the Minister under Conditions 5, 10 and 12 without submitting it for approval under section 143A of the EPBC Act, if the taking of the action in accordance with the revised plan would not be likely to have a new or increased impact. If the person taking the action makes this choice they must: a. notify the Department in writing that the approved plan has been revised and provide the Department with an electronic copy of the revised plan; b. implement the revised plan from the date that the plan or strategy is submitted to the Department; and	4.7	Section 4.7 identifies the option of amending the MEMP without submitting it for approval and specifies the steps to be taken if this option is implemented.

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Marine Environmental Management Plan

Ref	Cond. No.	Condition Requirement	Plan Reference	Demonstration of how the plan addresses the condition requirement
		c. for the life of this approval, maintain a record of the reasons the approval holder considers that taking the action in accordance with the revised plan would not be likely to have a new or increased impact.		
33	39	The person taking the action may revoke their choice under Condition 38 at any time by notice to the Department. If the person taking the action revokes the choice to implement a revised plan, without approval under section 143A of the Act, the plan approved by the Minister must be implemented.	4.7	Section 4.7 identifies the option of amending the MEMP without submitting it for approval and specifies the steps to be taken if this option is implemented.
34	40	Condition 38 does not apply if the revisions to the approved plan or strategy include changes to environmental offsets provided under the plan or strategy in relation to a matter protected by a controlling provision for the action, unless otherwise agreed in writing by the Minister. This does not otherwise limit the circumstances in which the taking of the action in accordance with a revised plan or strategy would, or would not, be likely to have new or increased impacts.	4.7	Section 4.7 identifies the option of amending the MEMP without submitting it for approval only where condition 38 applies.
35	41	If the Minister gives a notice to the person taking the action that the Minister is satisfied that the taking of the action in accordance with the revised plan would be likely to have a new or increased impact, then: <ul style="list-style-type: none"> o Condition 38 does not apply, or ceases to apply, in relation to the revised plan; and o the person taking the action must implement the plan approved by the Minister. 	4.7	Section 4.7 identifies the option of amending the MEMP without submitting it for approval only where condition 38 applies.
36	42	Conditions 38, 39, 40 and 41 are not intended to limit the operation of section 143A of the EPBC Act which allows the person taking the action to submit a revised plan to the Minister for approval.	4.7	Section 4.7 identifies the option of amending the MEMP without submitting it for approval only where condition 38 applies.
37	44	Unless otherwise agreed to in writing by the Minister, the person taking the action must publish all management plans, reports and strategies referred to in these conditions of approval on their website. Each management plan, report and strategy must be published on the website within 1 month of being approved by the Minister or being submitted under Condition 38a).	Document Control Sheet	The document control sheet (pg. 2) identifies the date when the MEMP and associated sub-plans were published on the POTL website.

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APPENDIX C

Contact Details for CU Project

Position	Organisation	Phone Numbers	Email
General Manager Infrastructure and Environment	POTL	1800 531 561	cugeneral@townsville-port.com.au
Project Director CU	POTL	1800 531 561	cugeneral@townsville-port.com.au
Environment Manager CU	POTL	1800 531 561	cugeneral@townsville-port.com.au
Project Engineer CU	POTL	1800 531 561	cugeneral@townsville-port.com.au
Environmental Advisor CU	POTL	1800 531 561	cugeneral@townsville-port.com.au
Environmental Advisor CU	POTL	1800 531 561	cugeneral@townsville-port.com.au
Safety Advisor CU	POTL	1800 531 561	cugeneral@townsville-port.com.au
Port Tower	POTL Duty Officer	07 4781 1683	
Regional Harbour Master	Maritime Safety Queensland	07 4421 8100	townsville.maritime@msq.qld.gov.au

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APPENDIX D

Environmental Incident Written Notice Form

ENVIRONMENTAL INCIDENT WRITTEN NOTICE	
Date of Incident/...../.....
Time of Incident:..... am / pm
Location of Incident	
Incident Details	Describe clearly and in detail the circumstances leading to the incident. As far as possible, verify the facts recorded and identify witnesses.
Incident Details	Quantity and type of substance released, if applicable.
Incident Details	CU Project personnel involved (operator, driver, including their approval / registration number and any others).
Incident Details	Vehicle and registration details, if applicable.
Suspected Cause of Incident	

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ENVIRONMENTAL INCIDENT WRITTEN NOTICE	
Sampling Results	Results of any sampling performed in relation to the incident, if applicable.
Corrective Actions	Actions taken to mitigate any environmental harm caused by the incident.
Preventative Actions	Proposed actions to prevent a recurrence of the incident.
Date of Notice/...../.....
Time of Notice:..... am / pm
Designated Contact Details	Name
	Ph No.
	Email
	Signed (Project Director CU) / Manager Environment CU

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APPENDIX E

Extract from POT 442 – Risk Management Guidelines

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ANNEXURE A – QUALITATIVE MEASURES OF CONSEQUENCE OR IMPACT

Rank	Operations (Trade)	Financial Loss	Asset Loss	Interruption to Services	Reputation, Image & Political Implications	Performance	Criminal Penalty	Information Security	Safety	Health	ENVIRONMENT		
											Nature & Extent of Potential / Actual Environmental Harm	Frequency, Intensity, Duration, Offensiveness of Activity	
1	Insignificant	Insignificant impacts on operations and trade. No navigation closure. Insignificant delays.	\$0 - \$50K	Little or no impact on assets	< ½ day	Unsubstantiated, low impact, low profile or no news items. No political implications.	Up to 5% variation to KPI	Pecuniary	Can be dealt with by routine operations.	Minor temporary – irritation, first aid treatment required.	Reversible health effects of concern.	Environmental Nuisance resulting in insignificant impacts on the natural receiving environment, plants and/or wildlife. No impact on community or business.	Low frequency / intensity / duration activity (days). No substantiated offensive amenity impacts on surrounding area.
2	Minor	Minor impact on operations and trade. No navigation closure but minor revenue loss due to loading or unloading delays.	\$50K - \$500K	Minor loss or damage to assets	½ - 1 day	Substantiated, low impact, low news profile. Minor political implications resulting in minor local media attention.	5 -10% variation to KPI	Pecuniary	May threaten the efficiency or effectiveness of some aspect of the infrastructure but would be dealt with internally.	Minor temporary – medical treatment required.	Severe reversible health effects of concern.	Environmental Nuisance resulting in minor adverse impacts on or unreasonable interference with the natural receiving environment, plants and/or wildlife, but noticeable effect on amenity. Minimal impact on community or businesses.	Minor frequency / intensity / duration activity carried out during normal operating hours over a short term (weeks). Minor amenity impacts experienced within surrounding area with potential to trigger complaints.
3	Serious	Temporary navigation closure or prolonged restriction of navigation.	\$500K - \$5m	Major damage to assets	1 day – 1 week	Substantiated, public embarrassment, moderate impact, moderate (local) media attention. Political implications resulting in directions given by the shareholding Ministers.	10-25% variation to KPI	Imprisonment	Would not threaten the infrastructure but would mean that the program could be subject to significant review or changed ways of operating.	Major permanent – loss of body part or function.	Short term health problems or irreversible health effects of concern.	Actual or potential Material Environmental Harm resulting in noticeable adverse or unreasonable impact on the natural environment, plants and/or wildlife within surrounding area. Noticeable impact on community or businesses.	Medium frequency / intensity / duration activity carried out for a significant period of time on most days or over a period of months. Adverse amenity impacts on community giving rise to multiple/sustained substantiated complaints.
4	Major	Temporary closure of a navigation channel affecting movements to the port for several days. Ensuing loss of trade.	\$5m - \$10m	Significant loss of assets	1 week – 1 month	Substantiated, public embarrassment, high impact, high (local and national) news profile, third party actions. Political implications resulting in state/ national inquiry.	25-50% variation to KPI	Imprisonment	May threaten the survival or continued effective functioning of the infrastructure or project and require top-level management intervention.	Major permanent – single fatality, total blindness, quadriplegia.	Health impacts, long term/chronic health problems or life threatening or disabling illness.	Material Environmental Harm resulting in significant adverse or unreasonable impact on the natural receiving environment, plants and/or wildlife over an extensive area as a result of the duration or magnitude or nature of impact. Extended disruption/impact to community or businesses. Potential exists to remedy the impact if the activity is ceased or impact is reversible.	High frequency / intensity / duration activity carried out during most hours of the day or impact is long term (years). Significant adverse impacts on community.
5	Catastrophic	Port closes, navigation seriously disrupted for an extended period. Serious and long term loss of trade.	>\$10m	Complete loss of assets	> 1 month	Substantiated, public embarrassment, very high multiple impacts, high widespread (national and international) news profile, third party actions. Political implications resulting in state/ national inquiry. Significant national and worldwide attention from governments and media condemning activity.	>50% variation to KPI	Imprisonment	May threaten the survival of not only the infrastructure but also the business, possibly causing major problems for clients.	Multiple fatalities	Long term, permanent or irreversible health problems. Chronic health affects too many people.	Serious Environmental Harm resulting in irreversible, high or widespread adverse impact on the natural receiving environment/high conservation or special significance area. Severe and protracted disruption/impact to community or businesses. Irreversible loss of amenity experienced.	Permanent high frequency / intensity / duration activity carried out 24/7. Serious adverse impacts on community.

ANNEXURE B – QUALITATIVE MEASURE OF LIKELIHOOD

Level	Descriptor	Description	Ongoing Activities	Projects
1	Rare	May only occur in exceptional circumstances	Unlikely in the life of the facility	0.1% chance
2	Unlikely	Could occur at some time	Once in 20 years	1% chance
3	Possible	Might occur at some time	Once in 5 years	10% chance
4	Likely	Will probably occur in most circumstances	Once per year	50% chance
5	Almost Certain	Expected to occur in most circumstances	Many times per year, continuous	99% chance

ANNEXURE C – RISK EVALUATION FACTORS

	Consequence	Insignificant	Minor	Serious	Major	Catastrophic
Likelihood	Score	1	2	3	4	5
Rare	1	L 1	L 2	L 3	L 4	M 5
Unlikely	2	L 2	L 4	M 6	M 8	S 10
Possible	3	L 3	M 6	M 9	S 12	H 15
Likely	4	L 4	M 8	S 12	H 16	E 20
Almost Certain	5	M 5	S 10	H 15	E 20	E 25

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APPENDIX F

Inshore Dolphin Monitoring Plan POT 2154

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APPENDIX G

Marine Megafauna Monitoring Plan POT 2155

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APPENDIX H

Shorebird Monitoring Plan POT 2156

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APPENDIX I

Invasive Marine Pest Monitoring Plan

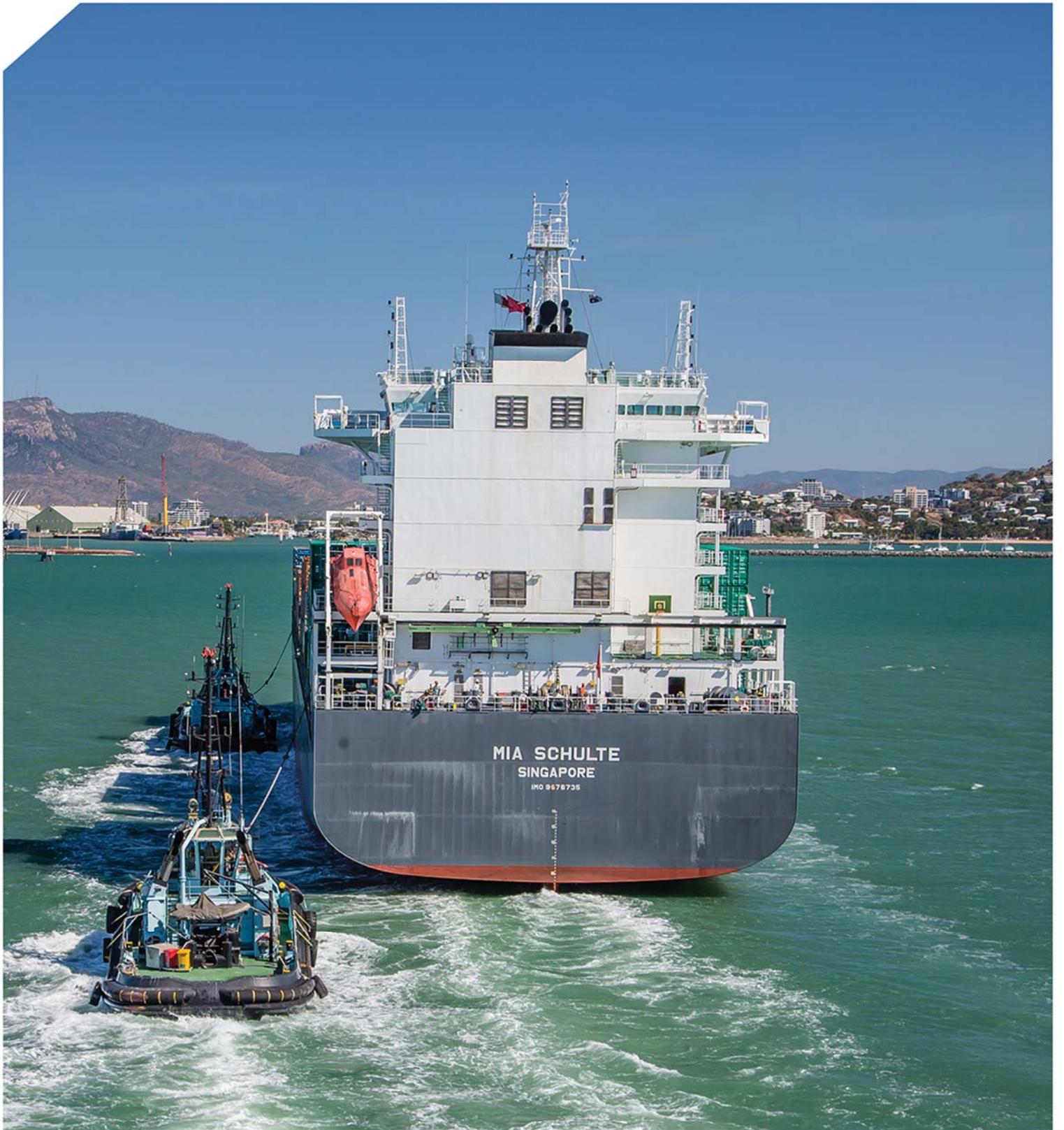
The CU Project Invasive Marine Pest Monitoring Plan will be developed as part of the management arrangements for the dredging component of the project. No plan is included at this stage given this version of the MEMP is focused on Rockwall and Revetment Construction Activities.

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APPENDIX J

Environmental Procedure for Pile Driving POT 2157

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