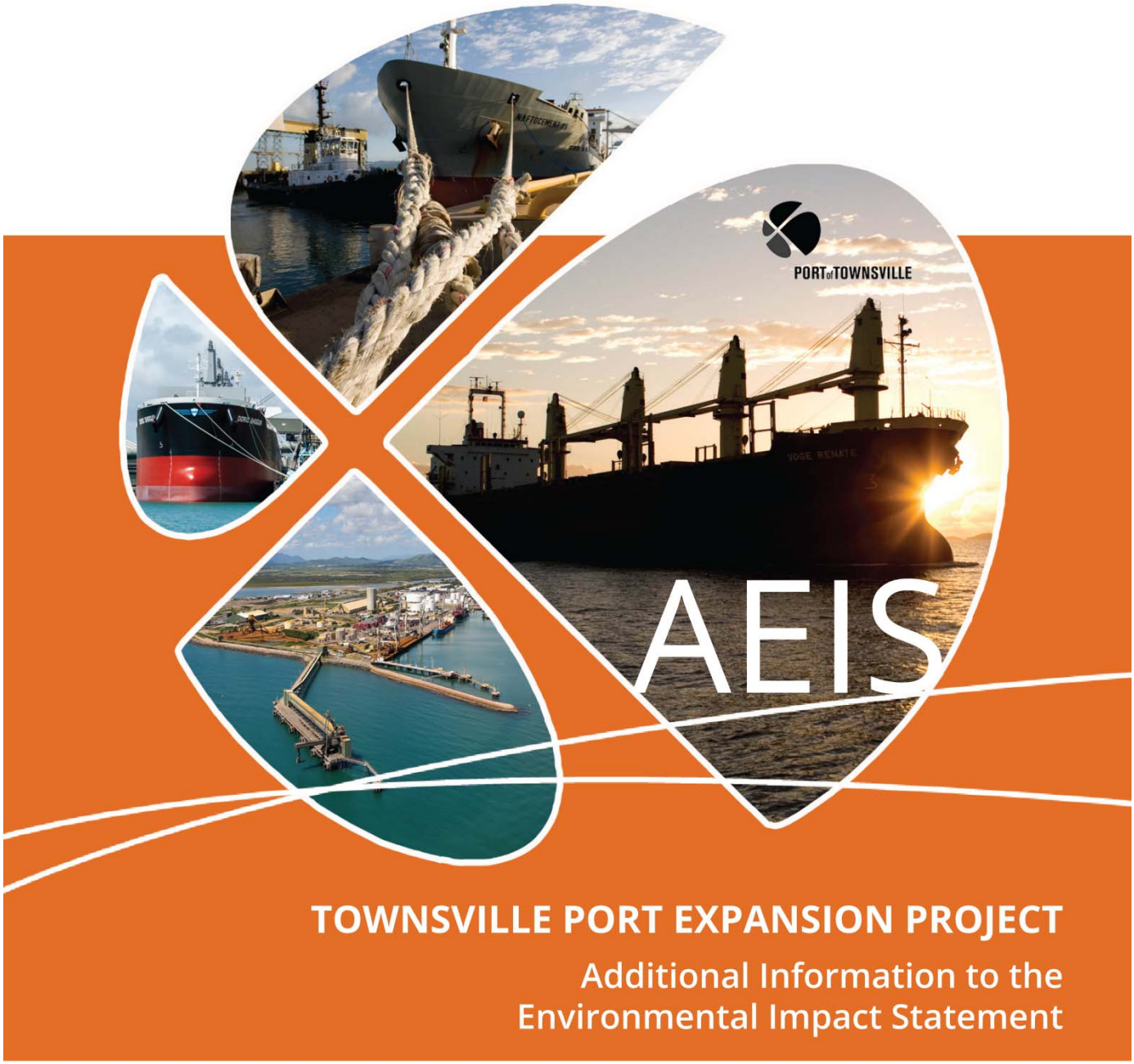

TOWNSVILLE PORT EXPANSION PROJECT

Additional Information to the Environmental Impact Statement

TOWNSVILLE PORT EXPANSION PROJECT

APPENDIX B2

Construction Environmental Management Plan

AECOM BMT WBM

1.0 Introduction

This Construction Environmental Management Plan (CEMP) details environmental management procedures to be incorporated into Contractor's Environmental Management Plan (EMP) during the construction phase of the Port of Townsville Limited (POTL) Port Expansion Project (PEP).

The aim of the CEMP is to manage risk and reduce the potential for negative impacts on the environment associated with PEP construction. The CEMP has been developed from, and is consistent with, the PEP Environmental Impact Statement (EIS) and Additional Information to the Environmental Impact Statement (AEIS). The CEMP has been updated in response to submissions received through the EIS process, and considers the design refinement where appropriate.

1.1 Project Overview

The Port of Townsville is located on Cleveland Bay, approximately three kilometres east of the city centre in Townsville, North Queensland (refer to Figure 1). The Port is situated in the Great Barrier Reef World Heritage Area and the majority of the port infrastructure is not within the Great Barrier Reef Marine Park.

The Port of Townsville is a multi-purpose port that handles predominantly bulk and general cargo. The PEP aims to address capacity constraints and accommodate future growth in trade over a planning horizon to 2040.

The PEP includes development of port infrastructure and work to 'top of wharf': dredging, reclamation, breakwaters and revetments, wharves, access roads, rail loop, and trunk services and utilities. The PEP does not include the development 'above wharf', which may include terminal pavements, ship-loaders and unloaders, materials conveyors, storage buildings for products, rail loaders and unloaders, stacking and reclaiming equipment, storage tanks and pipelines.

As the Port develops, individual Port tenant operations will be subject to separate statutory assessment and approval requirements. Operators will be required to obtain all necessary approvals and licenses in accordance with their statutory requirements prior to the start of operations or in accordance with statutory timing requirements.

1.2 Purpose

The purpose of this CEMP is to identify the preferred means of addressing and reducing potential adverse environmental impacts associated with the construction phase of the PEP. The CEMP:

- describes POTL's commitments regarding environmental performance and the reduction of adverse impacts
- specifies the actions that would be taken to implement the commitments (such as monitoring)
- identifies corrective actions to rectify any deviation from performance standards
- provides an action program to enable delivery of the environmental commitments so they are achieved and implemented.

The contents of this CEMP may be incorporated into either the successful construction tenderer(s) management plans or undertaken by the Port depending on ultimate contractual arrangements.

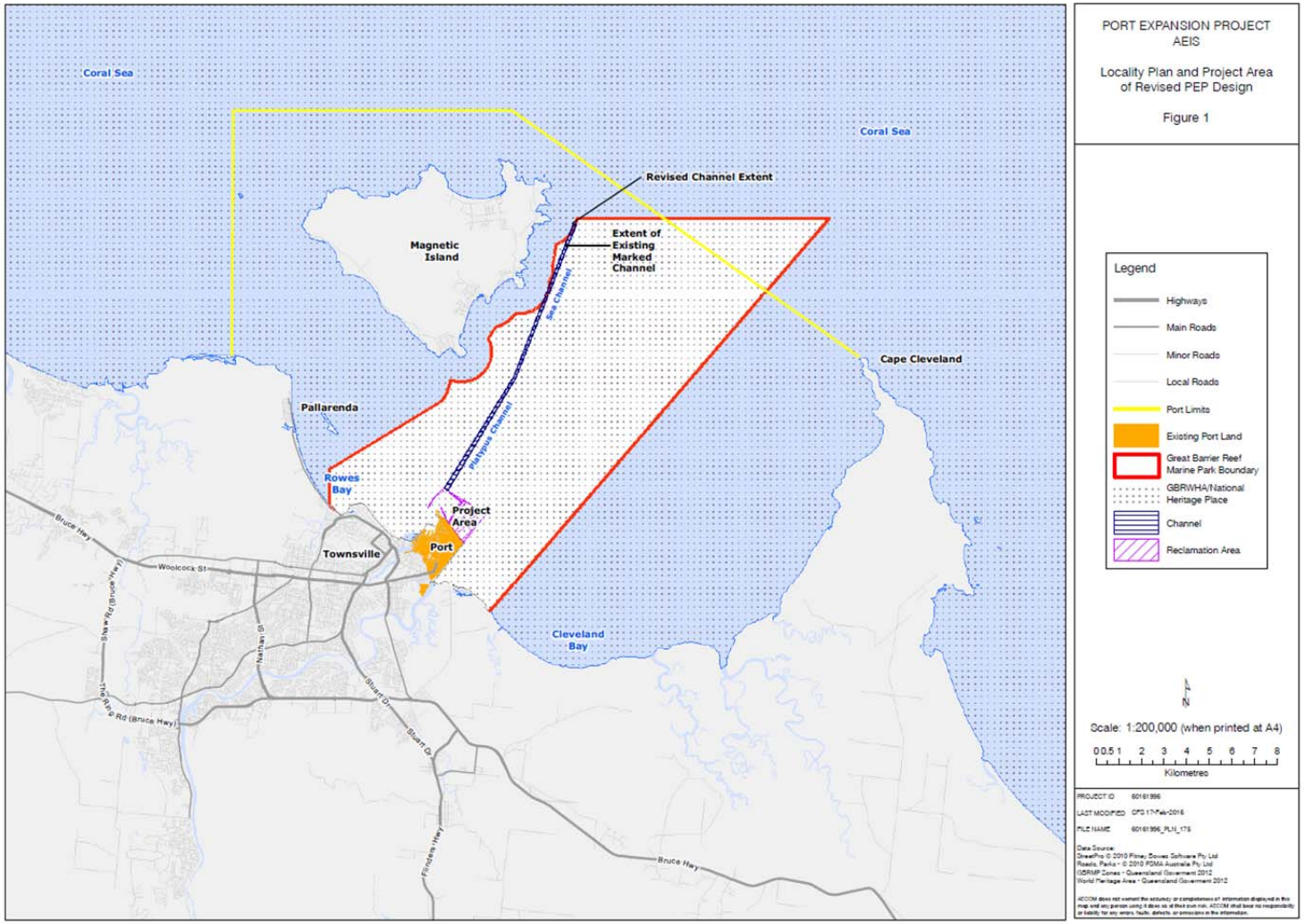

Figure 1 Port of Townsville locality plan

1.3 Scope

The CEMP addresses the on-land construction phase of the PEP and builds upon the Environmental Management Plan (Overview) (refer Chapter C1 of the EIS).

A separate Dredge Management Plan (Appendix B1 of the AEIS) and a Maritime Operations Management Plan (Chapter C2.4 of the EIS) have been prepared to cover the in-water aspects and management associated with the dredging phase and vessel movements of the PEP and the future outer harbour operations.

A Vessel Traffic Management Plan for Construction (Chapter C.2.3 of the EIS) has also been prepared and is to be used as a template for individual vessel operators to develop and implement their own plans in accordance with regulatory requirements.

A separate Operational Environmental Management Plan (Appendix B3 of the AEIS) has been prepared to cover operational activities associated with POTL's operation of the expanded port.

The key environmental values likely to be affected by on-land construction activities associated with the PEP were identified in the EIS and re-assessed in the AEIS. For each key value identified, the environmental management procedures to address potential risks and impacts have been provided. General environmental requirements for the construction phase are provided at Part A of the EIS.

1.4 Terms of Reference

The CEMP also responds to the Queensland government's *Townsville Port Expansion Project - Terms of Reference for an Environmental Impact Statement*, February 2012, issued by the Coordinator General (Appendix A1 of the EIS). Section 10 of the Terms of Reference states the detail required in the Environmental Management Plans (EMPs). The requirements of Section 10, and where these requirements are addressed in this Plan, are shown in Table 1.

The Terms of Reference also refer to additional information that is to be provided in the EMPs. The information required - and where these requirements are addressed in this Plan - are paraphrased in Table 2.

This CEMP has also been prepared to satisfy the requirements of Section 5.11 of the *Commonwealth Guidelines for an Environmental Impact Statement for Port of Townsville Port Expansion Project*, *Queensland*, as they apply to the construction phase.

Table 1 Terms of Reference Section 10 – EMP requirements

Requirement	Addressed in Section
Detail the EMPs for both the construction and operation phases of the Project.	This CEMP details the management measures for the pre-construction and construction phase. Separate EMPs have been prepared for operations, dredging and shipping.
The EMP is developed from, and be consistent with, the information in the EIS. The EMPs must address discrete project elements and provide life-of-proposal control strategies. It must be capable of being read as a stand-alone document without reference to other parts of the EIS.	The project elements from the EIS that require management measures are detailed in Section 3.0 and form the basis of this CEMP.
The EMP must comprise the following components for performance criteria and implementation strategies: ▪ the proponent's commitments to acceptable levels of environmental performance, including environmental objectives, performance standards and associated measurable indicators, performance monitoring and reporting.	Refer to Section 2.0 for an outline of POTL's Environmental Management System. Refer to Section 5.0 for specific environmental commitments during construction.
Impact prevention or mitigation actions to implement the commitments.	Management actions are provided in Section 5.0.
Corrective actions to rectify any deviation from performance standards.	Management actions are provided in Section 5.0.
An action program to ensure the environmental protection commitments are achieved and implemented. This will include strategies in relation to: ▪ continuous improvement ▪ environmental auditing ▪ monitoring ▪ reporting ▪ staff training ▪ a rehabilitation program for land to be disturbed under each relevant aspect of the proposal.	Management actions are provided in Section 5.0. An action program is provided in Section 6.0.
The recommended structure of each element of the EMP is: ▪ element/issue ▪ operational policy	Refer to Section 5.1.1.

Requirement	Addressed in Section
▪ performance criteria ▪ implementation strategy ▪ monitoring ▪ auditing ▪ reporting ▪ corrective action.	

Table 2 Terms of Reference - additional EMP requirements

Section from Terms of Reference	Requirement	Addressed in Section
5. Environmental values and management impacts	*The mitigation measures, monitoring programs etc. identified in ... the EIS should be used to develop the EMP for the Project.*	The Plan has been developed from, and is consistent with, the PEP EIS and AEIS.
3.6.2 Objectives of the EIS	*The purpose of the EIS is to:... provide information to formulate the Project's EMP.*	
5.3.5 Transport management strategies	*Conditions of approval for transport management impacts should also be detailed in the EMP.*	Transport impacts and transport management measures are provided in Section 5.1.11. Marine transport is addressed in the Dredge Management Plan, Vessel Traffic Management Plan and Maritime Operation Management Plan (Part C of the EIS).
5.5.1 Sensitive environmental areas	*Outline how these measures* [to mitigate impacts on sensitive environmental areas] *will be implemented in the overall EMP for the Project.*	Measures to mitigate impacts on sensitive marine and land environments are provided in Section 5.0.
	The overall EMP for the Project should address the performance requirements of the relevant policies and regional vegetation management codes published by Department of Environment and Heritage Protection (DEHP).	There is no on-land vegetation impact by the PEP as such DEHP performance requirements are not applicable. Mitigation measures for terrestrial ecology are provided in Section 5.1.5.
5.5.2 Terrestrial flora	*Include details of any post construction monitoring programs.*	Not applicable. There are no terrestrial flora impacts to monitor.
	Outline how these measures [addressing harm to the ecological values of the area] *will be implemented in the overall EMP for the Project.*	Not applicable. There are no terrestrial flora impacts to mitigate.
	Discuss the [weed management] *strategies in accordance with provisions of the Land Protection (Pest and Stock Route Management) Act 2002 (Qld)...in the pest management plan in the EMP for the Project.*	Pest management element is provided at Section 5.1.6
5.5.3 Terrestrial Fauna	*Outline how these measures* [for protecting rare or threatened species] *will be implemented in the overall EMP for the PEP.*	Mitigation measures for terrestrial ecology are provided in Section 5.1.5.
	Discuss the [feral animal (including pest)] *strategies in accordance with the provisions of the Land Protection (Pest and Stock Route Management) Act ... in the pest management plan in the EMP for the PEP.*	Pest management element is provided at Section 5.1.6.
5.5.4 Aquatic ecology	*Outline how ...* [aquatic ecosystem] *measures will be implemented in the overall EMP for the PEP.*	Aquatic ecology aspects are covered in the Dredging Management Plan (Appendix B1).
5.6.2 Potential impacts and mitigation measures	Incorporate strategies to enhance water resource values into the EMP (paraphrased).	Mitigation measures for water resources are provided in Section 5.1.3.
13 Appendices – Consultation report	*...plans for ongoing consultation to be outlined and included in the EMP.*	Refer Section 7.0.

1.4.1 Legislation

The CEMP has been developed cognisant of legislative requirements set out in Commonwealth and State government Acts and Regulations. Specific requirements including permits and works approvals are described in Section C1.0 of the EIS and revised in Appendix C2 of the AEIS.

1.4.1.1 Commonwealth legislation

Commonwealth legislation considered in development of this CEMP (including Acts implementing relevant international conventions) includes:

- *Environment Protection and Biodiversity Conservation Act 1999*
- *Great Barrier Reef Marine Park Act 1975.*

1.4.1.2 State legislation

The following State legislation is relevant to the construction and has been considered in the development of this CEMP:

- *Sustainable Ports Development Act 2015*
- *State Development and Public Works Organisation Act 1971*
- *Coastal Protection and Management Act 1995*
- *Environmental Protection Act 1994 and Regulations*
- *Environmental Protection and Other Legislation Amendment Act 2014*
- *Fisheries Act 1994 and Regulations*
- *Marine Parks Act 2004 and Marine Parks (Great Barrier Reef) Zoning Plan*
- *Land Act 1994*
- *Nature Conservation Act 1992*
- *Transport Infrastructure Act 1994*
- *Sustainable Planning Act 2009 and Regulations.*
- *Aboriginal Cultural Heritage Act 2003*
- *Queensland Heritage Act 1992.*

1.4.1.3 State Planning Policies

The following State policies and plans are relevant to the construction and have been considered in the development of this CEMP:

- State Planning Policy
- State Development Assessment Provisions
- Environmental Protection Policies
- Conservation Plans
- Port notices and Port Land Use Plan.

2.0 Environmental Management System

POTL maintains its commitment to sustainable development and operation through its Environmental Management System (EMS). The EMS provides a framework for environmental management at the Port and reflects POTL's Environmental Policy and commitments to manage its activities with concern for people and the environment.

POTL's EMS is compliant with AS/NZS ISO 14001 2004 and facilitates continual improvement of environmental performance by:

- integrating environmental considerations into decision making and work practices related to the Corporation's core functions
- maintaining a high level of environmental awareness throughout the Corporation and the wider port community
- utilising systems which act to reduce the risk of environmental harm through the identification reporting, assessment, monitoring and control of environmental risks.

This CEMP includes the work elements necessary to satisfy environmental requirements in the construction phase of the PEP and generally complies with applicable elements of POTL's EMS.

Continuous improvement is a mandatory requirement of POTL's EMS. As part of the continuous improvement, the CEMP may be updated or amended as required, which may include being merged with other documents to streamline the EMP documentation or be incorporated into the Contractors CEMP. Any future amendments will take into account the intent of this document and the conditions of the existing approvals.

2.1.1 Environmental Policy

POTL Environmental Policy applies to POTL lands and activities, including the common user areas of the Port. It is:

- displayed at prominent locations in the workplace of POTL employees and on the website
- communicated to POTL employees and Contractors during induction and training
- reviewed regularly.

POTL's Environmental Policy (POTL, 2014) states:

Port of Townsville Limited (POTL) is committed to the protection of the environment and considers it as critical corporate value in the delivery and maintenance of port infrastructure and services and in planning for the future development of the Port of Townsville and Port of Lucinda.

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 employ the following principles: -

- *Integrate environmental considerations 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.*
- *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, identifying and acting on opportunities for improvement.*
- *Compliance with all relevant legislation, codes of practice and standards.*
- *Core functions to be conducted in a manner that will minimise waste, prevent pollution, promote efficient use of resources, reduce environmental impacts, and continually improve environmental and management system performance.*
- *Providing adequate resources including finances, to facilitate the fulfilment of POTL's environmental responsibilities.*

  POTL's Board and senior 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.

POTL personnel, Contractors and visitors must comply with the spirit and intent of the policy.

3.0 Project Description

The construction phase of the PEP includes the development of the following infrastructure and construction activities as summarised in Table 3.

Table 3 Summary of key PEP construction components

Component	Description
Construction of breakwater and land perimeter revetments	
Breakwater and revetment infrastructure (around reclamation perimeter).	Stage 1 will commence with the construction of a temporary revetment structure to capture soft material from under perimeter revetment bunds. Revetments with rock armouring will be constructed to protect the north-eastern and eastern edges of the Stage 1 reclamation area. Soft sediments from under revetments structures will be placed within the temporary revetment bunds. Stage 2 will continue construction of the revetment structure to the ultimate Project footprint. Soft sediments from under revetments structures will be placed within the Stage 1 reclamation area. A new north-eastern rubble mound breakwater with rock armouring will be constructed approximately one kilometre seaward of the existing eastern breakwater. The breakwater and revetment layouts will be configured to provide a protected outer harbour basin and the structural design will address extreme wave and water level events for the port infrastructure and land reclamation.
Western Breakwater (if required).	Contingent upon detailed analysis, construction of a new western breakwater for additional outer harbour protection without affecting the port design and operations.
Dredging works for augmentation of channels and development of outer harbour	
Handling and placement of dredged sediments (onshore).	Approximately 11.4 million m^3 of dredged marine sediments from dredging in the outer harbour basin and Sea and Platypus channels will be placed within revetment bunds as part of land reclamation activities (note that management of dredge tailwater is addressed in the Dredge Management Plan). Dewatering and ground improvement of emplaced sediments on tidal lands will be undertaken.
Development of Port Land	
Bunds and treatment areas.	A reclaimed area of approximately 150 ha will be developed on tidal lands eastwards of the existing harbour (and defined by the north-eastern and eastern revetments and the wharf alignments). Selected fill material from land sources will be used to build bunds over tidal lands, constructed as conventional earth/rock fill structures, to contain the reclamation material. Internal bunds will be constructed on the alignments of future key infrastructure (including rail and roads) as suitable foundations for heavy loading. Bund structures will be constructed and configured to retain fill in stages and provide settlement areas for the temporary management and treatment of reclamation tailwater and thereafter permanent reclamation areas for created land. Select ponds will be used for the treatment of stormwater. A surface capping layer (approximately one metre thickness) and pavement layer will be applied where necessary
Port Infrastructure	
Berths and wharves.	Up to six berths will be constructed in the outer harbour (termed Berth 12 and Berth 14 through Berth 18) to support import and export trades and cargo handling requirements. At berths, wharves will be constructed similar to the existing wharf structures for vessel berthing, mooring, loading and unloading of general cargo, dry bulk and bulk liquid goods. Berths will be sized for vessels with a nominal length overall of 250 m. Construction will be staged to meet the demand for cargo throughput. This may be sequential on a berth-by-berth basis, or in stages involving multiple berth development. Berth pockets will be dredged to an all-tides depth of up to approximately -15.5 m Lowest Astronomical Tide (LAT).

Component	Description
Development on port land and ancillary services	
Cargo storage and handing areas.	Land area of approximately 150 ha to accommodate: ▪ cargo operations, ▪ cargo storage area ▪ road and rail transport corridors ▪ cargo storage area in rail loop. Final finished reclamation level nominally +7.5 m LAT (+5.6 m AHD) adjacent to the wharf structures and falling to the eastern revetment to accommodate drainage of stormwater.
Road Infrastructure.	Internal circulation road on the reclamation area to access facilities and key infrastructure. Vehicles ranging from cars to articulated combination vehicles will have access. Connection via existing Benwell Road to the Eastern Access Corridor. Access corridors along the back of wharves and from the main access road to individual storage areas will be built.
Rail Infrastructure.	A rail loop is proposed behind cargo storage and handling areas with provision for connecting to the existing rail network and Eastern Access Corridor (once feasible).
Buildings.	Construction of temporary and permanent port operations buildings as required for specific operations.
Utilities and other services.	Installation of services infrastructure relating to stormwater, water supply (including for fire fighting), power supply, waste water reticulation and telecommunications. Port security infrastructure. Area and road lighting.
Maritime operations	
Vessel movements during construction.	Establishment of temporary navigational aids.

3.1.1 Materials

The land area required for the PEP will be reclaimed using dredged material from the outer harbour basin as well as the Sea and Platypus Channels.

Selected fill material will be required from land sources to build bund structures to retain the dredged fill, to protect the reclamation from erosion and wave attack, and provide settlement areas for the management and treatment of the reclamation tailwater. Engineered fill material will also be required for construction of capping and pavement layers on the surface of the reclamation.

The bund walls will be constructed as conventional earth/rock fill structures. POTL intends to use the project specific Granitevale quarry and/or other quarries within the Townsville Region to supply the rock required for the breakwaters, revetments and bund walls for the PEP.

Construction materials will be transported to the site by road from various suppliers in the region and will predominantly be via the Eastern Access Corridor. Some construction materials may also be delivered via ship directly to the Port.

3.1.2 Design requirements

Perimeter bund walls exposed to the sea will be designed to withstand extreme metocean conditions with limited overtopping.

The bund walls will be designed and constructed to retain fine sediments within the reclamation, thereby avoiding the uncontrolled loss of fine sediments from the dredged material through the bund wall and back into Cleveland Bay.

The perimeter bund structure would typically incorporate a height adjustable weir box in the last settling pond to allow control of the overflow tailwater discharge over a period of time.

Internal bund walls will control the movement of sediment and water so that areas can be dewatered and suspended sediments can settle to control the quality of tailwater. Internal bund walls need to withstand wind-wave action that may be generated within the bunded areas.

Height adjustable weir boxes may be implemented between bunded areas to control the flow of water and suspended sediments. These are generally located to create a long path for the movement of water to maximise retention time.

3.1.3 Construction period

Construction of the PEP berths and associated land-side infrastructure is scheduled to occur over many years as shown in Figure 2. This figure outlines the revised Project construction timing based on the development staging described in Section 2.4 and Table 2.2 of the AEIS). Note that the program has assumed pre-construction planning activities commencing in 2017, which is dependent upon approval and approval timeframes.

As recognised in the AEIS, predicting exactly when the new berths and associated infrastructure would be required is dependent on trade growth and available port capacity. Other considerations including the long lead time in obtaining approvals, procuring contractors, construction timing and duration, require that the proposed sequence and timing of development would be regularly reviewed and adjusted to reflect the actual demand for cargo handling capacity and shipping requirements.

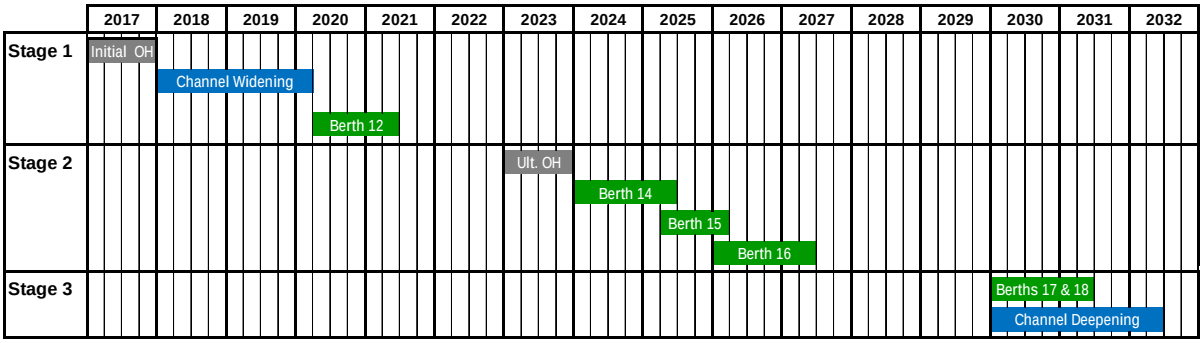

Figure 2 Indicative PEP staging program

Stage 1 will require construction of the perimeter bund wall / revetment structures for the initial outer harbour reclamation area prior to dredging work associated with the development of a widened channel and Berth 12. Similarly, Stage 2 will require construction of the perimeter bund wall / revetment structures for the ultimate outer harbour reclamation area prior to dredging work associated with the development of the berths.

There are seven key construction activities over the sequence of stages:

- *Construction of the Perimeter Revetments.* Construction will be undertaken in Stage 1 and completed in Stage 2.
- *Construction of the Main Breakwater.* Construction will be undertaken in Stage 2
- *Construction of the Western Breakwater* (if required). Construction would be undertaken in Stage 2.
- *Dredging.* Dredging is covered in the Dredge Management Plan. Dredging of the outer harbour basin would occur during all stages. Dredging to widen the Sea and Platypus channels will occur during Stage 1 and the dredging to deepen these channels will occur during Stage 3.
- *Construction of the reclamation area* – commences in Stage 1 and continues throughout construction phases.
- *Installation of road, rail, civil works and services* – commences in Stage 1 and continues throughout construction phases
- *Wharf construction* – commences in Stage 1 and continues throughout each of the construction phases for the respective berths.

3.1.4 Construction equipment

During the construction phase, for the land-based construction activities, a range of plant and equipment will be used to develop the Port, including:

- trucks (on road and off-road)
- excavators
- bulldozers
- cranes
- utility vehicles
- front end loaders
- stone column or wick drain rig
- bobcats
- grader

- paving machine
- track machine.

4.0 General Requirements

This section outlines the general environmental requirements that Construction Contractors would be expected to fulfil, in addition to meeting specified requirements for the environmental values set out in Section 5.0.

To ensure that activities are being carried out consistently with any existing procedures or protocols and comply with relevant environmental duties and obligations as set out in legislation and with environmental permit requirements, Contractors would be expected to address these general requirements as part of project planning, and throughout the construction period.

4.1.1 General method statement

For each construction work package, a general method statement will be prepared outlining the intended scope of works and methodology to be employed. At a minimum, the method statement will include the following:

- introduction
- description of the general scope of works (noting this may need to be by Stage only)
- references to relevant legislation, company standards (such as quality, occupational health and safety and environment management systems), how they apply to the current project and any other project specific document
- responsibilities of the Contractor and key staff
- a clear map of the areas where the construction activities are to take place consistent with regulatory approvals
- a general description of the construction process and the specifics of the plant to be used including the construction methods and controls.

4.1.2 Site/activity-based Environmental Management Plan

A site/activity-based EMP will need to be prepared by the Construction Contractor prior to commencement of construction. The Contractor's EMP must address the following:

- environmental commitments – including a commitment by senior management of the Contractor to achieve specified and relevant environmental goals
- identification of environmental risks and potential impacts
- control measures for routine operations to reduce the likelihood of environmental harm
- a suitable Emergency Spill/Incident Response Plan and Cyclone Plan
- contingency plans and Emergency Response Procedures for non-routine situations, organisational structure and responsibility
- development and implementation of hazardous material handling procedures
- monitoring commitments
- conducting environmental assessments
- appropriate staff training
- record keeping
- periodic review of environmental performance and continual improvement.

4.1.3 Hazardous substances, health and safety

The Construction Contractor is to meet Occupational Health and Safety requirements. Appropriate precautions and controls will be implemented to address all identified risks and protect the health and safety of people working at the site. Maintenance of measures, plant and equipment.

The Construction Contractor must check that measures, plant and equipment necessary to undertake the activity are operated and maintained in a proper and efficient condition.

This includes appropriate servicing and maintenance of engines and emission control devices such that emissions comply with relevant guidelines and standards.

4.1.4 Reasonable and practicable measures

The Construction Contractor must take reasonable and practicable measures to prevent and/or reduce the likelihood of environmental harm being caused.

4.1.5 Notification of environmental harm

The Construction Contractor is responsible for complying with all legislation. This includes complying with the general environmental duty which is to do all that is reasonable and practicable to minimise the risk of environmental harm.

In the case of material or serious environmental harm (as defined in the Queensland *Environmental Protection Act 1994*) occurring as a result of carrying out of the construction works the Contractor is responsible for ceasing activities and notifying POTL and the DEHP Pollution Hotline or local DEHP office as soon as practicable after becoming aware. Other notifications may be required in accordance with legislation and port notices as relevant to the specific event.

5.0 CEMP Elements

This section of the CEMP identifies specific environmental management procedures related to the on-land construction phase of the PEP. The requirements in this section are intended to apply in addition to the general requirements outlined in Section 4.0 of this CEMP. In most cases it will need to be integrated in broader site-based management plans and documentation and any conditions of approval imposed on the PEP under relevant legislation.

These requirements are to be addressed by either POTL or its Construction Contractor (whomever is applicable) as part of project planning so that the activities being carried out are consistent with any existing procedures or protocols in port limits or under relevant corporate environmental policies or strategies.

5.1.1 Structure of the EMP

The following environmental values have been identified in the EIS as key risks for the set of factors that require consideration in the CEMP:

- land
- water resources (surface water aspects) *
- marine water quality (reclamation aspects) *
- marine sediment quality (reclamation aspects) *
- marine ecology and conservation (reclamation aspects) *
- terrestrial ecology
- air quality
- noise and vibration
- greenhouse gases
- waste
- transport and infrastructure
- indigenous cultural heritage
- non-indigenous cultural heritage
- visual amenity and lighting
- pest management
- hazards and hazardous materials.

*Note: Marine aspects in relation to these factors are considered in the Dredge Management Plan.

For each value identified, an environmental management strategy and actions have been developed to address potential risks that may arise as a result of construction activities. Each value has a stated environmental objective, performance criteria, management actions, monitoring, reporting, and corrective actions. The structure used for the strategy and actions are outlined in Table 4.

Table 4 CEMP structure

Order of Implementation	Plan Component	Description of Content
1	Environmental risks (Aspect-Impact)	The environmental aspect of construction requiring management response - strategies and actions.
2	Environmental Performance Objective	The guiding performance objective that applies to the values of the factor.
3	Performance Criteria	The criteria by which the success of the implementation of the policy will be determined.
4	Monitoring and Reporting	The process of measuring actual performance, or how well the policy has been achieved, including format, timing and responsibility for reporting and auditing of the monitoring results.
5	Implementation Strategies and Management Actions	The mechanisms and management actions through which the performance objective will be achieved.
6	Corrective Action	The action to be implemented and by whom in the case where a performance criterion is not met.

A separate table is provided to address each value (refer to Section 5.0). 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 this CEMP.

5.1.2 Land

Aspects and Impacts	▪ Disturbed dredged or excavated Potential Acid Sulfate Soils (PASS) material, or imported contaminated soil/fill placed in the reclamation area ▪ Spills or leakage of fuels/oil and other contaminants, hazardous materials or dangerous goods causing soil contamination.
Environmental Performance Objectives	▪ To avoid environmental harm as a result of changes to landforms in relation to: - contamination - PASS.
Performance Criteria	▪ No soil contamination from leaks and spills on site ▪ No contaminated fill from external sources brought into site ▪ PASS management procedures and plans developed and implemented.
Monitoring and Reporting	▪ Regular site inspections to check for leaks, spillage and damage to bunded/storage/refuelling areas and equipment ▪ Monitor the pH of retained water in the dewatering ponds ▪ Monitor and record sources, condition of fill and any movement offsite.

Implementation Strategies and Management Actions	Responsibility	Timing	Corrective Actions
Minimise the risk of fuel/oil spills by undertaking regular inspections and maintenance of machinery, including: ▪ daily inspection of machinery ▪ inspecting for leaks prior to allowing any external vehicles or machinery on site ▪ maintenance of site machinery in accordance with manufacturers recommendations.	Construction Contractor	Throughout the construction period.	Any material impacted by spills shall be managed through: ▪ investigation ▪ excavation of impacted material. Disposal of impacted material at a suitable disposal facility, with appropriate DEHP approvals and by a licensed waste disposal subcontractor as required.
Store hazardous materials, chemicals, oils and fuels in clearly designated storage areas, as far as practicable from sensitive receptors. Ensure storage areas consist of a compacted base and appropriate bunding to contain spillages in accordance with applicable standards at the time of construction. Cover storage areas to prevent stormwater infiltration.		Install designated storage areas prior to storing hazardous material on site.	Inspect and maintain storage areas, including repair of bunds if necessary. Clean up any spilled material promptly.
Store chemicals in accordance with appropriate standards. Maintain an up-to-date hazardous and potentially hazardous materials register on site.		Throughout the construction period.	A permit shall be obtained from the appropriate authority for bulk storage of chemicals, oils and/or petroleum products, where on site storage exceeds minor storage limits.

Implementation Strategies and Management Actions	Responsibility	Timing	Corrective Actions
Develop Acid Sulfate Soil Management Plan in consultation with DEHP for management and monitoring of the reclamation area to inform the contractor of the risks and management requirements for PASS. Include appropriate triggers and protocols eg monitor water quality (pH and DO, minimum) of standing water within the reclamation area and tailwaters prior to discharge.	POTL / Construction Contractor	Prior to construction period.	Review and revise controls required.
Sample Pleistocene soils in dredge areas to confirm PASS status/management requirements. Place any PASS dredge spoil in reclamation area below LAT. Survey to confirm top of placed PASS. Where PASS is placed above LAT, sample in accordance with relevant standards to confirm the need for further management measures.			
Maintain significant depths of filling over soft Holocene sediments in the reclamation area to prevent heaving and displacement of PASS above sea level.	Construction Contractor	Throughout the construction period.	Review reclamation management practices if adverse impacts are observed.
Keep dredged materials wet and saturated during transport to reclamation area. Ensure compliance with holding times outlined in the Queensland Acid Sulfate Soil Technical Manual.			Review reclamation management practices if pH drops observed in waters within the reclamation area.

5.1.3 Water resources (stormwater and drainage)

Aspects and Impacts	▪ Increased turbidity of marine waters during construction of PEP lands due to sediment in stormwater runoff (note that dredge tailwater management is discussed in the Dredge Management Plan) ▪ Stormwater contamination may arise due to oil/fuel leaks ▪ Effects on marine life, as well as indirect potential impacts to human health, through the exposure and potential release of contaminants in stormwater to marine waters.
Environmental Performance Objectives	▪ No adverse impacts to water and sediment quality of Cleveland Bay ▪ To avoid contaminants discharging into the environment from construction activities ▪ To minimise to the extent practicable, turbidity impacts from stormwater discharges beyond the development footprint.
Performance Criteria	▪ No exceedance of limits set in reactive monitoring program for suspended sediment concentrations for open waters ▪ Fuel / chemical storage is secure or any spill is adequately contained and cleaned up ▪ No failure of erosion and sediment controls.
Monitoring and Reporting	▪ Regular inspections of stormwater runoff areas to check for cleanliness and potential for contaminants to impact on water quality ▪ Regular site inspections to check for leaks, spillage and damage to bunded storage areas ▪ Immediately notify POTL in the event of an uncontained spill ▪ Site specific management actions including erosion and sediment controls, will be developed and implemented by the Contractor prior to construction.

Implementation Strategies and Management Actions	Responsibility	Timing	Corrective Actions
Direct stormwater to sediment basins to eliminate off-site migration of sediment. Stage the design and placement of sediment basins according to construction schedules.	Construction Contractor	Prior to construction of reclamation area.	Review and modify equipment and controls if any adverse impacts are observed.
Control surface drainage from the reclaimed area through appropriate site management (i.e. drainage reports to sediment ponds and drains are collected and prevented from entering the sea by use of low bunds, sand bags or other temporary control measures). Integrate on-site containment in the turbidity management/treatment that is required for any discharge water.	Construction Contractor and POTL during periods between construction stages.	During construction of the reclamation area.	Increase tailwater residence time in the tailwater pond. Redirect supernatant from the filling cells to other cells to allow further settlement before being discharged.

Implementation Strategies and Management Actions	Responsibility	Timing	Corrective Actions
Minimise the risk of fuel/oil spills by undertaking regular inspections and maintenance of machinery, including: ▪ daily inspection of machinery ▪ visual inspection for leaks prior to allowing any external vehicles or machinery on site ▪ maintenance of site machinery in accordance with manufacturers recommendations.	Construction Contractor	Throughout the construction period.	Any material impacted by spills shall be managed through: ▪ investigation ▪ excavation of impacted material ▪ disposal of impacted material at a suitable disposal facility, with appropriate DEHP approvals and by a licensed waste disposal subcontractor.
Store hazardous materials, chemicals, oils and fuels in clearly designated storage areas, as far as practicable from sensitive receptors. Ensure storage areas consist of a compacted base and appropriate bunding to contain spillages in accordance with applicable standards at the time of construction. Cover storage areas to prevent stormwater infiltration.		Install designated storage areas prior to storing hazardous material on site.	Inspect and maintain storage areas, including repair of bunds if necessary. Clean up any spilled material promptly.
Minimise the risk of contaminant spills by: ▪ undertaking spill response training for staff ▪ developing and implementing hazardous material handling procedures ▪ implementing emergency response procedures ▪ installing oil and grit separators for equipment maintenance areas on site ▪ providing spill control materials including booms and absorbent materials in the event of a chemical spill.		Develop procedures applicable for each construction area and update for change of work as appropriate.	Regularly review the spill clean-up procedures / equipment and update as required.
Minimise to the extent practicable contamination of surfaces exposed to runoff generation through source controls.		Install in each staged construction area prior to staged construction commencement.	Review and modify equipment and controls if adverse impacts are observed.

5.1.4 Marine ecology and conservation (reclamation aspects)

Aspect and Impacts	▪ Increased turbidity and potential contamination from on-site facilities, potentially affecting water quality, species or the quality of their habitats ▪ Light spill from construction plant and port facilities may lead to disorientation of marine animals ▪ Emission of waste may increase the risk of entanglement and/or ingestion of marine debris by marine vertebrates ▪ Increase in noise and vibration leading to marine fauna temporarily avoiding affected area.
Environmental Performance Objectives	▪ To avoid indirect effects on marine megafauna and the marine ecology ▪ To prevent contamination from construction activities entering the marine environment.
Performance Criteria	▪ No injury or fatality to marine megafauna as a result of PEP construction activities ▪ No reduction in fauna diversity or occurrence evident from light spill ▪ No permanent loss of benthic habitat beyond the development footprint.
Monitoring and Reporting	▪ Regular site inspections carried out to monitor the construction area for compliance with light and waste management procedures, and hazardous material handling procedures ▪ Marine performance monitoring of relevant aquatic indicators.

Implementation Strategies and Management Actions	Responsibility	Timing	Corrective Actions
Implement light management procedures to reduce light spill to the marine environment (refer to Scenic Amenity and Lighting 5.1.15) whilst ensuring that Health and Safety including Navigation Safety is maintained.	Construction Contractor	During design phase; implement and check during construction phase.	Review light management procedures.
Implement waste management procedures (refer to Waste Section 5.1.10).		During construction phase.	Review waste management procedures and modify if required so that rubbish does not enter water and potentially affect marine animals.
Implement control measures to reduce the likelihood and impact of contaminant spills (refer to Land Section 5.1.2 and Water Resources Section 5.1.3).			Review and modify equipment and controls if any adverse impacts are observed.
Implement control measures to reduce the likelihood and impact of turbidity (refer to Water Resources, Section 5.1.3).	Reclamation area Contractor		Review and modify site practices if any adverse impacts are observed (refer also to tailwater management elements of the Dredge Management Plan).

5.1.5 Terrestrial ecology

Aspect and Impacts	▪ Injury/mortality to avifauna resulting from construction activities such as vehicle movements ▪ Noise emissions (and vibration) e.g. piling leading to behavioural disturbance in fauna ▪ Light spill from construction plant leading to disturbance to avian habitats ▪ Introduction and/or spread of declared weeds or animal pests.
Environmental Performance Objectives	▪ To avoid injury and death of avifauna from construction activities ▪ To avoid or minimise to the extent practicable the level of noise and light spill on adjacent habitat areas used by shorebirds ▪ To avoid introduction and/or spread of declared weeds or animal pests.
Performance Criteria	▪ Light spill from Project site to bird habitat areas on the sand spit is avoided or minimised to the extent practicable whilst ensuring that Health and Safety including Navigation Safety is maintained ▪ No reported incidents of harm or mortality to terrestrial fauna as a result of construction activities ▪ Effective control of declared weeds on the construction site ▪ No increase to the number of pest species on the construction site above background levels in surrounding port.
Monitoring and Reporting	▪ Regular site inspections for injured wildlife ▪ Any incidents that affect terrestrial fauna to be reported to relevant authorities ▪ Regular site inspections for declared weed infestations, and animal pests.

Implementation Strategies and Management Actions	Responsibility	Timing	Corrective Actions
Enforce site speed limits to reduce fauna collision.	Construction Contractor	Prior to and during construction.	Review and modify controls as required.
Limit unnecessary vehicle use near sensitive areas to prevent disturbance to sensitive receptors.			
Implement procedures on the handling and reporting of injured fauna.			
Maintain plant equipment and machinery.			
Orientate light and noise emitting equipment away from foreshore whilst ensuring that Health and Safety including Navigation Safety is maintained.			
Consider lighting design and arrangements to reduce light spill from the site to shorebird habitat on the spit at the mouth of Ross River.			
Implement control measures to manage noise risks to fauna outside of the Port (refer to Noise and Vibration, Section 5.1.8).			
Implement weed and animal pest management on site (refer to Weed and Animal Pest Management Section 5.1.6).			

5.1.6 Weed and animal pest management

Aspects and Impacts	▪ Introduction and/or spread of declared weeds by site movements and to and from site ▪ Introduction or spread of pest animals into the construction site.
Environmental Performance Objectives	▪ To avoid the spread of declared weeds and pests to and from the site ▪ To minimised to the extent practicable the attraction of the PEP area to pest animals.
Performance Criteria	▪ Effective control of declared weeds on the construction site ▪ No increase to the number of pest species on the construction site above background levels in surrounding port ▪ No mosquito breeding habitat is created.
Monitoring and Reporting	▪ Regular site inspections for declared weed infestations ▪ Monitor the presence and abundance of pest animal species in the PEP reclamation area ▪ Regular site inspection for mosquito breeding areas prior to and during the wet season.

Implementation Strategies and Management Actions	Responsibility	Timing	Corrective Actions
Limit vehicle movement through known declared weed infested areas.	Construction Contractor	Throughout construction period.	Review and modify controls as required.
Wash down vehicles and plant equipment entering or leaving site for the first or last time in accordance with industry standards.			Review and modify operational practices if there is a breach.
Use wheel wash whenever vehicles move from unsealed roads to sealed roadways e.g. road between excavation area and off-site.			
Keep construction work area free of food waste or other attractants to mice and rats.		Throughout construction period.	Mice and rats will be trapped or poisoned before numbers cause human health concerns.
Keep construction work area free of food waste or other attractants to dogs, cats and foxes.			Feral dogs, foxes and cats will be trapped and euthanised humanely.
Keep construction work area free of food waste or other attractants to cane toads and birds.			Licensed pest control contractor engaged to control numbers if required.
Ensure imported fill material is weed free.			Review and modify controls as required.
Inspect construction site for potential mosquito breeding locations.		Prior to and during the wet season.	Regularly review the construction site and implement controls if required during the construction phase.

5.1.7 Air quality

Aspects and Impacts	▪ Fugitive dust from exposed surfaces during construction may result in: - increased risks to human health - nuisance - discolouration of buildings or structures ▪ Fuel combustion emissions from vehicles and equipment.
Environmental Performance Objectives	▪ To meet or exceed air quality standards relating to dust from construction activities ▪ To meet or exceed air quality standards relating to vehicle emissions from construction activities ▪ Record and address air quality complaints.
Performance Criteria	▪ Construction meets or exceeds Environmental Protection (Air) Policy 2008 standards and appropriate ambient air quality guidelines at sensitive receptor locations ▪ Adaptive management in response to complaints from stakeholders affected by dust emissions or in accordance with reactive dust monitoring result and trigger values.
Monitoring and Reporting	▪ Visual monitoring and observation of weather conditions that result in dust liberation and elevated particle concentration ▪ Continuous monitoring and/or air quality monitoring campaigns ▪ Record and respond to complaints.

Implementation Strategies and Management Actions	Responsibility	Timing	Corrective Actions
Implement Reactive Monitoring Program and trigger values.	POTL and Construction Contractor	Prior to and throughout construction period.	Review and modify measures as required.
Reduce fuel combustion emissions through management measures such as: ▪ turning engines off while parked on site ▪ regularly tuning, modifying or maintaining equipment, plant and machinery to reduce visible smoke and emissions ▪ implementing site speed limits ▪ reducing haul road lengths ▪ managing vehicle movement to prevent queuing/idling.	Construction Contractors	Throughout construction period.	Review and modify measures as required.

Implementation Strategies and Management Actions	Responsibility	Timing	Corrective Actions
Implement dust control measures including: ▪ erecting localised windbreak barriers on activities (to 2.4 m height), particularly to the west of works, if required ▪ using water sprays on stockpiled and disturbed areas ▪ using water sprays (water truck) to suppress dust on trafficked areas ▪ using a wheel wash whenever vehicles move from unsealed roads to sealed roadways e.g. road between excavation area and off-site ▪ adjusting work practices (as required) based on wind observations (e.g. ceasing dust-generating works under extreme windy conditions or when dust is observed to leave the site) ▪ adjusting work practices (as required) based on real time dust monitoring ▪ where necessary vehicles to cover loads when transporting fill.	Construction Contractor / POTL		Implement corrective measures outlined in Air Quality Reactive Monitoring Program which includes triggers against a staged approach: Investigate, Action and Stop Work: ▪ Investigate: designed to identify the issue, the likely reasons and formulate a response should the Action stage be reached. ▪ Action: designed to implement those measures formulated in the Investigate stage and review their effectiveness. ▪ Stop Work: there is a high likelihood that the pollutant criterion may be reached. Works are to stop at this stage until the measured pollutant levels are below the Action level. Amend construction program for modifying or scheduling works that mobilise particulates depending on ambient conditions that may cause wind re-suspension.
Stabilise vacant land areas (by methods such as planting / hydro mulching) as soon as practicable after reclamation construction has been completed.	Construction Contractor	Following construction of each stage.	Review and implement additional corrective measures to avoid unacceptable dust nuisance.
Maintain vacant fill areas between PEP development stages so as to minimise dust nuisance.	POTL	Between stages.	Increase frequency of inspection of vacant areas and undertake identified maintenance actions.
Operate a complaints management system.	POTL	At all times.	Review and modify management practices as required.

5.1.8 Noise and vibration

Aspects and Impacts	▪ Onsite construction equipment, particularly during piling works and rockfill reclamation, causing offsite disturbance of sensitive receivers ▪ Heavy vehicles impacting receivers on Boundary Street and near the boundary of the site ▪ Vibration effects during the construction phase from use of plant and equipment and haulage.
Environmental Performance Objectives	▪ To meet or exceed noise and vibration standards relating to dust from construction activities ▪ To minimise to the extent practicable the number of complaints related to noise and vibration events during the construction phase.
Performance Criteria	▪ Noise and vibration levels to meet relevant Queensland standards or appropriate noise guidelines at sensitive receptors ▪ Record and address noise and vibration complaints.
Monitoring and Reporting	▪ Noise and/or vibration monitoring will be carried out by Construction Contractor as required ▪ Record and respond to complaints.

Implementation Strategies and Management Actions	Responsibility	Timing	Corrective Actions
Proactively notify any affected residents and commercial operators of planned construction activities (including timing and duration of piling and rockfill placement).	POTL / Construction Contractor	Prior to noise generating activities.	Revise notification procedures and times to allow adequate consideration of potential noise impacts by the community.
Restrict piling activities to prescribed daytime work hours, excluding Sundays and Public Holidays. Consider alternative piling types, e.g. screw-type piling in place of impact piling if these alternative methods are available and feasible. Implement strategies to avoid megafauna interactions e.g. undertake visual monitoring during piling activities, soft starts etc.	Construction Contractor	During piling operations.	Review and modify construction practices if effects are anticipated to be prolonged. Monitoring, and adjusting where necessary, elements of piling such as reducing the height and weight of the impact hammer.
Consider noise mitigation when operating construction equipment / plant, including: ▪ selecting low-noise plant and equipment in good working order ▪ ensuring that equipment has high-quality mufflers installed ▪ ensuring that equipment has been well maintained and fitted with appropriate silencers that meet the design specifications ▪ orientating plant known to emit noise strongly in one direction (ie. manifolds on compressors) so that noise is directed away from noise sensitive receptors ▪ ensuring that machines that are used intermittently are shut down in the intervening periods between works or throttled down to a minimum ▪ ensuring that silencers and enclosures are kept intact, rotating plant is balanced, loose bolts tightened, frictional noise reduced through lubrication and cutting noise reduced by keeping blades sharp		Throughout construction period.	Review and modify construction practices as required.

Implementation Strategies and Management Actions	Responsibility	Timing	Corrective Actions
▪ ensuring that equipment which is not in use is shut down ▪ ensuring that only necessary power levels are used to complete construction tasks.			
Install an acoustic enclosure around noisy plant if it is fixed in a stationary location for one week or longer and likely to adversely affect sensitive receptors. The acoustic enclosure will be constructed in accordance with AS 2436-2010 - Guide to noise and vibration control on demolition and maintenance sites.		If plant remains stationary, where sensitive receptor may be impacted for at least a week.	Review and modify equipment and construction practices if adverse effects occur.
Locate site compounds and noisy plant as far away from noise sensitive receptors as practicable.		Throughout construction period.	Review and modify construction practices if adverse effects occur.
Operate a complaints management system.	POTL	At all times.	Review and modify management practices as required.

5.1.9 Greenhouse gases

Aspects and Impacts	▪ Greenhouse gas emissions will be produced during construction.
Environmental Performance Objectives	▪ To identify and reduce unmitigated greenhouse gas emission loads.
Performance Criteria	▪ To reduce the calculable greenhouse gas emissions through implementation of planning, design and management actions ▪ To meet applicable Commonwealth and State legislation and standards for greenhouse gas emissions release.
Monitoring and Reporting	▪ Monitoring energy use and changes to efficiency on site, primarily through the use of monitoring fuel consumption ▪ Monitoring key performance indicators to track construction greenhouse gas emissions, detect trends early and implement measures to address any unforeseen increases in emissions.

Implementation Strategies and Management Actions	Responsibility	Timing	Corrective Actions
Develop targets and goals through: ▪ developing a set of key performance indicators for carbon management for the construction of the port expansion to track performance over time ▪ monitoring key performance indicators on a monthly basis to enable Construction Contractor to monitor construction greenhouse gas emissions, detect trends early and implement corrective actions.	Construction Contractor	Prior to and during construction.	Review practices and monitor ongoing performance.
Increase awareness through: ▪ including greenhouse gas awareness training as part of site inductions ▪ undertaking periodic energy audits to monitor energy use and changes to efficiency on site ▪ keeping informed of best practice industry standards, research into new technology and energy efficiency and trial new approaches where appropriate.			
Implement energy efficiency measures through: ▪ maintaining equipment ▪ installing energy saving timers, light sensitive switches and energy efficient lighting in and around the buildings ▪ selecting appliances considering energy efficiency.	Construction Contractor	Throughout construction period.	Review practices and monitor ongoing performance.

Implementation Strategies and Management Actions	Responsibility	Timing	Corrective Actions
Reduce fuel use during construction by a number of measures such as: ▪ reducing transport distances and mobilisation of plant ▪ planning construction works to avoid double handling of materials ▪ using fuel efficient vehicles and investigate replacing diesel with a less emission intensive fuel, such as biodiesel or use of hybrid vehicles. Turning off engines when any significant delays occur ▪ coordinating and optimising staff travel arrangements.			
Reducing energy through material use and selection, including: ▪ considering use of materials with high recycled content or lower embodied construction materials ▪ considering the feasibility of sourcing polyester geotextile manufactured from recycled PET for the reclamation area ▪ where feasible, reducing the quantity of required construction material.			
Investigate the use of renewable energy on site, including: ▪ investigating renewable energy options for construction administration facilities ▪ investigating the feasibility of generating electricity from a renewable source on-site ▪ considering the use of solar panels for rock wall, security and road lighting during construction and powering isolated items such as pumps.	Construction Contractor	Detailed design phase.	Review practices and monitor ongoing performance.

5.1.10 Waste

Aspects and Impacts	▪ Incorrect handling and storage of waste materials may result in the introduction of wastes into the marine environment or surrounding lands ▪ Presence of waste materials may encourage pests and provide breeding habitats for mosquitoes.
Environmental Performance Objectives	▪ To coordinate the handling, storage, recycling and disposal of waste materials during construction ▪ No litter or waste lost from PEP development footprint into adjacent marine environment.
Performance Criteria	▪ Waste materials are handled, stored and disposed of in a safe and secure manner in accordance with relevant legislation ▪ Environmental disturbance to surrounding marine area from construction waste is avoided ▪ No mosquito or animal pest breeding habitat is created.
Monitoring and Reporting	▪ Auditing the management and disposal of waste from construction area ▪ Incident reporting in the Contractor database to identify areas where waste management is creating adverse impacts ▪ Regular site inspection for mosquito breeding areas prior to and during the wet season.

Implementation Strategies and Management Actions*	Responsibility	Timing	Corrective Actions
Minimise the amount of any substance required by construction activities to be brought and stored on site.	Construction Contractor	Throughout construction period.	Review waste management practices and modify if required if any adverse impacts are experienced.
Reuse construction waste on site (for examples bricks/concrete and timber) where appropriate.	POTL / Construction Contractor		
Take products that can be recycled to a licensed recycling facility where appropriate.	Construction Contractor		
Engage a licensed waste contractor to regularly remove and dispose of waste at licensed facilities and maintain waste disposal areas.			
Dispose of any waste products that cannot be re-used or recycled at a licensed waste disposal facility.			
Provide separate stockpiles or bins for different waste streams to avoid cross contamination of waste streams. Provide waste bins/receptacles to isolate liquid wastes.			
Store hazardous and asphaltic wastes in an appropriate bunded and covered area in accordance with Hazardous and Waste requirements listed in 5.1.14.			

Implementation Strategies and Management Actions*	Responsibility	Timing	Corrective Actions
Monitor the management (storage, handling) and disposal of waste from the construction area. Regular site inspections for mosquito breeding areas prior to and during wet season.			
Remove sewage via a temporary connection to reticulated waste water system if possible.		Until alternative or permanent connection established.	
Store empty drums and storage containers in an appropriately bunded area.		Throughout construction period.	
Store, handle and transport regulated waste in accordance with DEHP requirements, and where applicable the Hazardous and Waste requirements listed in 5.1.14.	POTL / Construction Contractor		
Inspect construction site for potential mosquito breeding locations.		Prior to and during the wet season.	Regularly review the construction site and implement controls if required during the construction phase.

*Management actions listed in order of preference in accordance with the waste hierarchy.

5.1.11 Transport and infrastructure

Aspect and Impacts	▪ Traffic congestion at some key road intersections due to construction traffic ▪ Degradation of pavement due to additional traffic loading on pavements from construction activities.
Environmental Performance Objectives	▪ To avoid disruption to existing road transport infrastructure.
Performance Criteria	▪ Traffic delays from construction at the port do not contribute significantly to peak traffic loads.
Monitoring and Reporting	▪ All heavy vehicle movements to be recorded by Contractor and reported to POTL ▪ Record and respond to complaints.

Implementation Strategies and Management Actions	Responsibility	Timing	Corrective Actions
Undertake additional impact assessments (Road Impact Assessment, Traffic Operations Assessment) a minimum of six months prior to haulage of quarry material commencing.	POTL	Prior to construction.	Review requirements and engage in discussions.
Undertake a Road Safety Audit a minimum of six months prior to haulage of quarry material commencing.			
Update the Port Community Forum as required for any transport and safety issues.			
Determine the need for pavement rehabilitation and maintence in consultation with DTMR.			
POTL to consider contractual requirements for Contractor to use certain routes.	POTL / Construction Contractor	Prior to and during construction.	Contractor to be penalised for not meeting obligations.
Investigate intersection improvements to mitigate against additional traffic impacts from construction related activities. Investigate cost effective solutions to alleviate additional traffic impacts from the expanded port activities.	Construction Contractor	Following commencement of construction and to be maintained throughout the construction phase.	Review intersection performance and apply alternative improvements if adverse impacts are experienced.
Heavy construction vehicles to use designated heavy vehicle routes. Consider future planning projects (i.e. Riverway Drive) in allocating haul routes.		Throughout construction period.	Review heavy vehicle route or driver training/induction.
Pavement rehabilitation and maintenance to cater for the additional loadings from construction related heavy vehicles if required by pavement impact assessment.		As required based on pavement impact assessment.	Road repairs to be undertaken as soon as practicable.
Operate a complaints management system.		Throughout construction period.	Review and modify management practices as required.

5.1.12 Indigenous and non-Indigenous cultural heritage

Aspects and Impacts	▪ Disturbance or loss of significant Indigenous cultural heritage values or artefacts in the marine environment or land ▪ Degradation or loss of non-Indigenous heritage item or place.
Environmental Performance Objectives	▪ To avoid disturbance of significant Indigenous values or artefacts ▪ To avoid disturbance or degradation of significant non-Indigenous heritage items or places.
Performance Criteria	▪ No loss or disturbance of significant Indigenous values or artefacts or non-Indigenous heritage items or places as a result of construction ▪ No complaints from people likely to be affected by damage to Indigenous or non-Indigenous areas or sites.
Monitoring and Report	▪ Reporting suspected Indigenous discoveries in accordance with the Cultural Heritage Management Plan ▪ Reporting suspected non-Indigenous discoveries to DEHP.

Implementation Strategies and Management Actions	Responsibility	Timing	Corrective Actions
Engage in ongoing consultation with Indigenous parties in accordance with the Cultural Heritage Management Plan.	POTL	Prior to and during construction.	Review the Cultural Heritage Management Plan and consultation protocol if there are risks of unexpected adverse effects or complaints are made.
Provide cultural heritage induction to relevant personnel and contractors involved in the construction prior to commencement of work.	Construction Contractor / POTL		Review the induction package and procedures if adverse impacts are observed.
Cease work immediately if any Aboriginal cultural heritage sites, materials or values are discovered during development pending an inspection by a representative from the Aboriginal Parties.	Construction Contractor	Throughout construction period.	Follow advice provided on inspection by the representative from the Aboriginal Parties.
Cease work immediately (within 100 m of the remains) If human skeletal material is discovered during development works. Immediately contact the Queensland Police, Cultural Heritage Coordination Unit (DEHP) and an Aboriginal representative.			If works do not cease, penalties apply. Follow advice provided by DEHP and the Aboriginal representative regarding established policy and procedures for dealing with human remains. .
Cease work around suspected non-Indigenous heritage discoveries and notify DEHP immediately.	Construction Contractor	Throughout construction period.	Follow advice provided by DEHP.

5.1.13 Scenic amenity and lighting

Aspect and Impacts	▪ Scenic amenity could be adversely affected by artificial light associated with the port infrastructure used during night time construction ▪ Local scenic amenity may be affected by constructional plant, waste and suspended sediment in the marine environment ▪ Dust emissions on residents and recreational users.
Environmental Performance Objectives	▪ To minimise to the extent practicable any temporary adverse visual effects associated with constructional activities of the PEP.
Performance Criteria	▪ Minimal visual impact on water clarity from construction activities ▪ Minimal visual impact from dust on surrounding areas ▪ Minimise light spill outside of POTL controlled areas.
Monitoring and Reporting	▪ Daily site inspections to monitor for water pollution, rubbish and dust associated with the construction ▪ Regular inspection of areas surrounding the port development area, particularly following changed lighting conditions e.g. at the start-up of a stage ▪ Record and respond to complaints.

Implementation Strategies and Management Actions	Responsibility	Timing	Corrective Actions
Manage lighting and design to reduce light spill from the site in so far as consistent with existing Operational Health and Safety and Land Use codes. Exterior lighting is to comply with relevant guidelines.	Construction Contractor	Throughout construction period.	Review and modify lighting management practices if any adverse impacts are observed.
Implement control measures to reduce: ▪ fugitive dust (refer to Air Quality, Section 5.1.7) ▪ stormwater releases (refer to refer to Water Resources, Section 5.1.3) ▪ suspended sediment from dredging (refer to Dredge Management Plan) ▪ waste control measures, including shipping waste.			Review and modify management practices if any adverse effects are reported.
The new site will be fenced and access controlled in a similar manner to the existing Port.			Inspect and repair damaged fencing.
Maintain a high standard of site cleanliness and presentation. Regularly remove and dispose of rubbish and manage waste in accordance with Waste, Section 5.1.10).			Review and modify site house-keeping practices and waste management if any adverse impacts are observed.
Progressive stabilisation of reclaimed land and reducing disturbed and exposed areas (e.g. access road verges).			Disturbed land to be established and vegetated as appropriate as soon as practical after reaching final levels.
Operate a complaints management system.	POTL	At all times.	Review and modify management practices as required.

5.1.14 Hazards and hazardous materials

Aspect and Impacts	▪ Potential impacts to human and environmental health from exposure to hazards and hazardous materials.
Environmental Performance Objectives	▪ To handle and store hazardous materials in the appropriate manner.
Performance Criteria	▪ Hazardous materials to be stored and handled in accordance with relevant standard or manufacturer's instruction.
Monitoring and Reporting	▪ Contractor to regularly inspect the Safety Data Sheet register for currency and completeness ▪ Conduct inspections to monitor construction area for compliance with hazardous material handling and storage procedures.

Implementation Strategies and Management Actions	Responsibility	Timing	Corrective Actions
Store and handle hazardous materials in accordance with relevant standards of manufacturer instructions (refer to Waste, Section 5.1.10).	Construction Contractor	Throughout construction period.	Review of handling and storage products to be undertaken.
Hold and display Safety Data Sheets (SDS) for hazardous materials in a prominent location near the storage and usage sites of hazardous materials.			Inspection of hazardous material storage and use areas for correct SDS.
Minimise the use of hazardous materials where possible and implement alternatives if feasible.			Review hazardous materials and identify alternatives where feasible.
Plan the delivery of hazardous materials to site in line with programmed use to avoid the need to store significant quantities of hazardous materials on site.			Review procurement procedures of hazardous materials in accordance with programed use.

6.0 Action Program

6.1.1 Continuous improvement

CEMPs are 'living documents' that require review (at least annually) during the construction phase and amended, as necessary, to allow new or changing environmental risks relating to the PEP to be addressed. Feedback systems will be in place for the duration of the Project to enable the CEMP to be updated and responsive to learning from any incidents, complaints and ongoing monitoring results.

This CEMP would be reviewed and updated to reflect knowledge gained during the course of construction and to reflect new knowledge and changed community standards (values). Changes to the CEMP may be developed and implemented in consultation with relevant authorities and stakeholders over time.

Other triggers for CEMP review may include:

- findings and recommendations of Contractor EMPs and/ or work procedures
- changes to organisational structure, roles and responsibilities
- changes in environmental legislation and/or policies
- new technologies / innovation relevant to applied methods and controls that provide innovative means of executing work in order to meet performance criteria.

6.1.2 Environmental auditing

POTL will monitor performance against the contract held with the Construction Contractor in accordance with its EMS during the Contractor's construction campaign.

6.1.3 Monitoring

Monitoring for each value is detailed at Section 5.0. This monitoring will enable:

- early detection of environmental management issues during construction
- where applicable, development of baseline environmental information for the Port from which trends and changes in the environmental quality of the Port over the period of construction can be detected.
- equipment to be maintained and calibrated in accordance with the manufacturer's instructions.

6.1.4 Records

During construction, records of the ongoing site monitoring shall be maintained. A range of records will be required during construction which include but are not limited to:

- those maintained to meet detailed design specifications and standards, construction works will be subjected to Inspection Test Plans (ITPs) that will confirm and ensure the design intent is achieved through quality testing and verification processes
- monitoring data sheets, calibration records, results and reports
- incident and complaints.

Records would allow auditing and encourage the use of preventative action, as well as corrective action following non-compliance.

Environmental records will be:

- kept as objective evidence of compliance with environmental requirements
- maintained according to POTL's Record Keeping Procedure and contract.

Environmental records and the EMP will be controlled in accordance with the Contractor Management System.

6.1.5 Staff training

Construction personnel shall attend an induction prior to commencing work at the site. The induction will include the environmental commitments and measures contained in this CEMP. Construction workers attending the induction will be mentored to support the implementation of commitments by construction staff.

7.0 Community Engagement

This section outlines plans for on-going consultation with the community.

7.1.1 General enquiries, information and visitors

Contact can also be made via POTL's website. POTL invites public comment via their 'Tell us what you think' page (http://www.townsville-port.com.au/feedback). General contact details for POTL are also provided on their website:

Telephone: 07 4781 1500
Facsimile: 07 4781 1525
Email: info@townsville-port.com.au.

Established lines of communication (e.g. Port Community Partnerships Forum, Stakeholder Engagement Management Plan or Complaints Policy (see below)) will be used as avenues to regularly convey information and receive feedback regarding POTL's practices to maintain high standards of community health and wellbeing for adjoining residents and visitors to the area. Project related information will be circulated via a range of avenues, well in advance of undertaking construction works to keep the community well informed. Such considerations include communication regarding:

- transport and safety issues to nearby residents and the general community
- entry restrictions, available sites of shore-based fishing and POTL plans for maritime activity and temporary signage at boat ramps in Ross Creek and Ross River
- stages for the PEP and potential effects on recreational and other boating into Cleveland Bay from Ross River and Ross Creek to the boating community and other organisations such as the Townsville Motor Boat and Yacht Club and the Coast Guard).

7.1.2 Complaints handling

Complaints can be made via POTL's website.

Complaints received directly by the Contractor must be recorded including investigations undertaken, conclusions formed and actions taken. Notification about the complaint and any associated response must be provided to POTL in a timely fashion.

The complaint response procedure will include:

(a) the time, date name and contact details of the complainant

(b) reasons for the complaint

(c) any investigations undertaken

(d) conclusions formed

(e) any actions taken.

All outcomes of complaint (s), including the full detail of the complaint and corrective actions undertaken by the Construction Contractor, shall be communicated to POTL for further review of corrective actions. Corrective actions shall be communicated to the complainant to close out the issues raised.