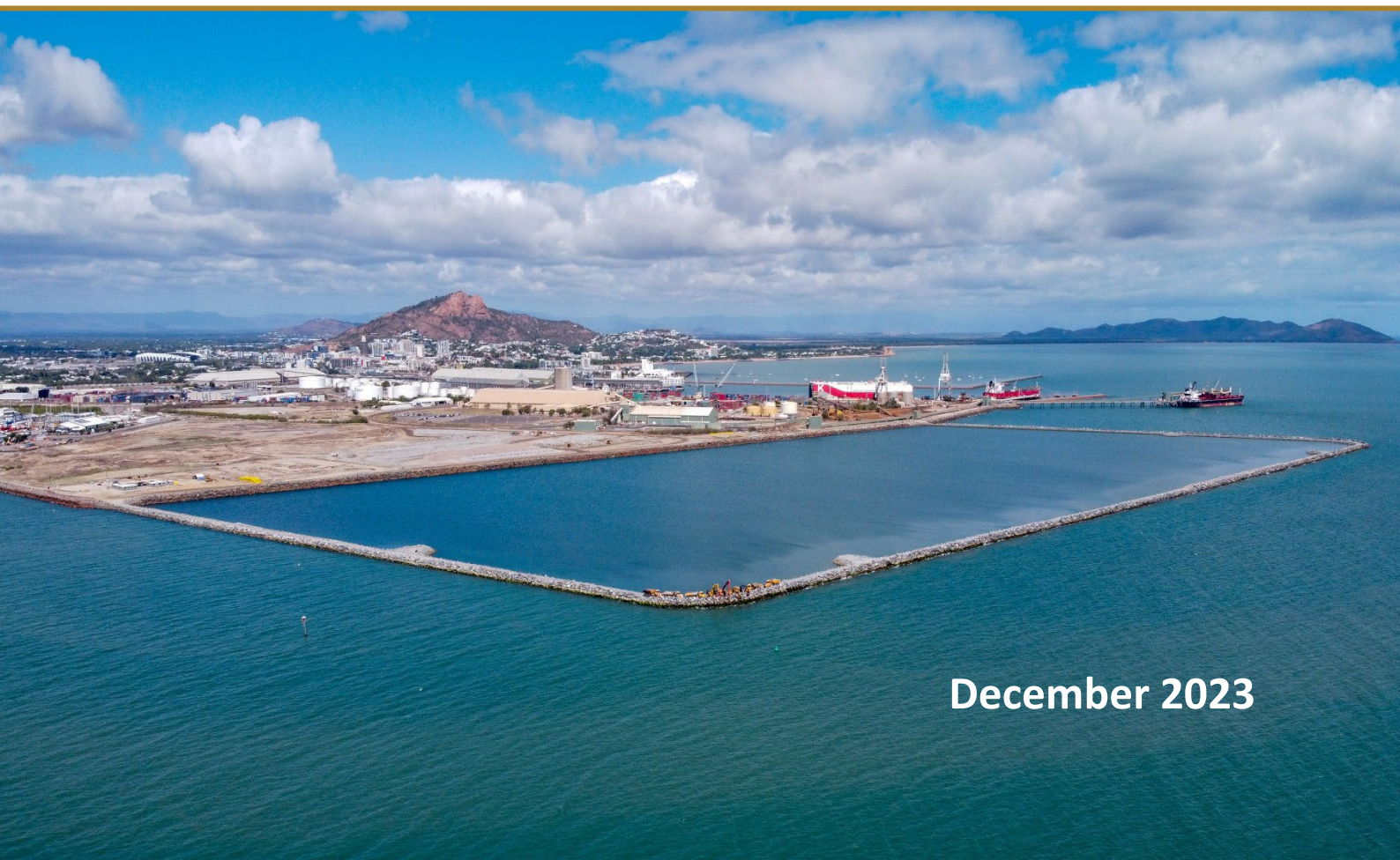


TOWNSVILLE PORT EXPANSION CHANNEL UPGRADE PROJECT

INVASIVE MARINE PEST MONITORING PLAN



DOCUMENT CONTROL SHEET

Revision history

Revision No.	Date	Changed by	Nature of amendment
0	17/09/2021	T Smith	Original Document
1	04/12/2023	T Smith	Updated to reflect revised monitoring program with the removal of the Western Breakwater works

DOCUMENT APPROVAL

Approval of the Invasive Marine Pest Monitoring Plan R0 was issued by DAWE on 22/10/2021.

The Invasive Marine Pest Monitoring Plan R0 was published on the Port's website on 01/11/2021.

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.

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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)

David McLoughlin

Organisation (please print)

Port of Townsville Limited

Date 06 / 12 / 2023

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GLOSSARY

AEIS	Townsville Port Expansion Project: Additional Information to the Environmental Impact Statement - Final (June 2017).
Biosecurity Qld	The Queensland Government Department of Biosecurity, or any other state agency regulating introduced marine pests
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
Department / DCCEEW	The Australian Government Department of Climate Change, Energy, the Environment and Water, or any other agency administering the <i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cth) from time to time
DMP	Dredge Management Plan
EIS	Port Expansion Project Environmental Impact Statement (March 2013)
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
IMPS	Invasive Marine Pest Species
Mechanical Dredge	A dredger that removes sediments via mechanical methods. Can include grab dredges (clamshells and buckets) or backhoe dredges.
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
PEP	Port Expansion Project
Port	Port of Townsville Limited
Vessel	A Ship, as defined under the Transport Operations (Marine Pollution) Act 1995 (TOMPA) and a Domestic Commercial Vessel, as defined under the "National Law"

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1 INTRODUCTION

Port of Townsville Limited (the Port) is a Government Owned Corporation established under the Government Owned Corporations Act 1993, which manages the Port of Townsville. The Port is located on Cleveland Bay, approximately three kilometres east of the city centre in Townsville, North Queensland. 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 the Port's long-term Port Expansion Project (PEP). The PEP (Figure 1) 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 and work to "top of wharf" facilities, namely, 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;
- Realignment of the Inner Harbour Entrance, including partial removal of an existing breakwater, to cater for the Platypus Channel widening at the Inner Harbour entrance;
- the construction of a temporary unloading facility;
- capital dredging and placement of capital dredge material in the reclamation area; and
- movement and installation of navigation aids:

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 reclamation area forms part of Lot 794 on SP308904 adjacent to the northern extent of the East Port area (Lot 791 on EP2348, which is Strategic Port Land), while the temporary unloading facility and activities are adjacent to Lot 794. The layout of the reclamation area, including the boundaries of Lot 794, is shown in Figure 2, along with the footprint of the temporary unloading facility (including dredge area).

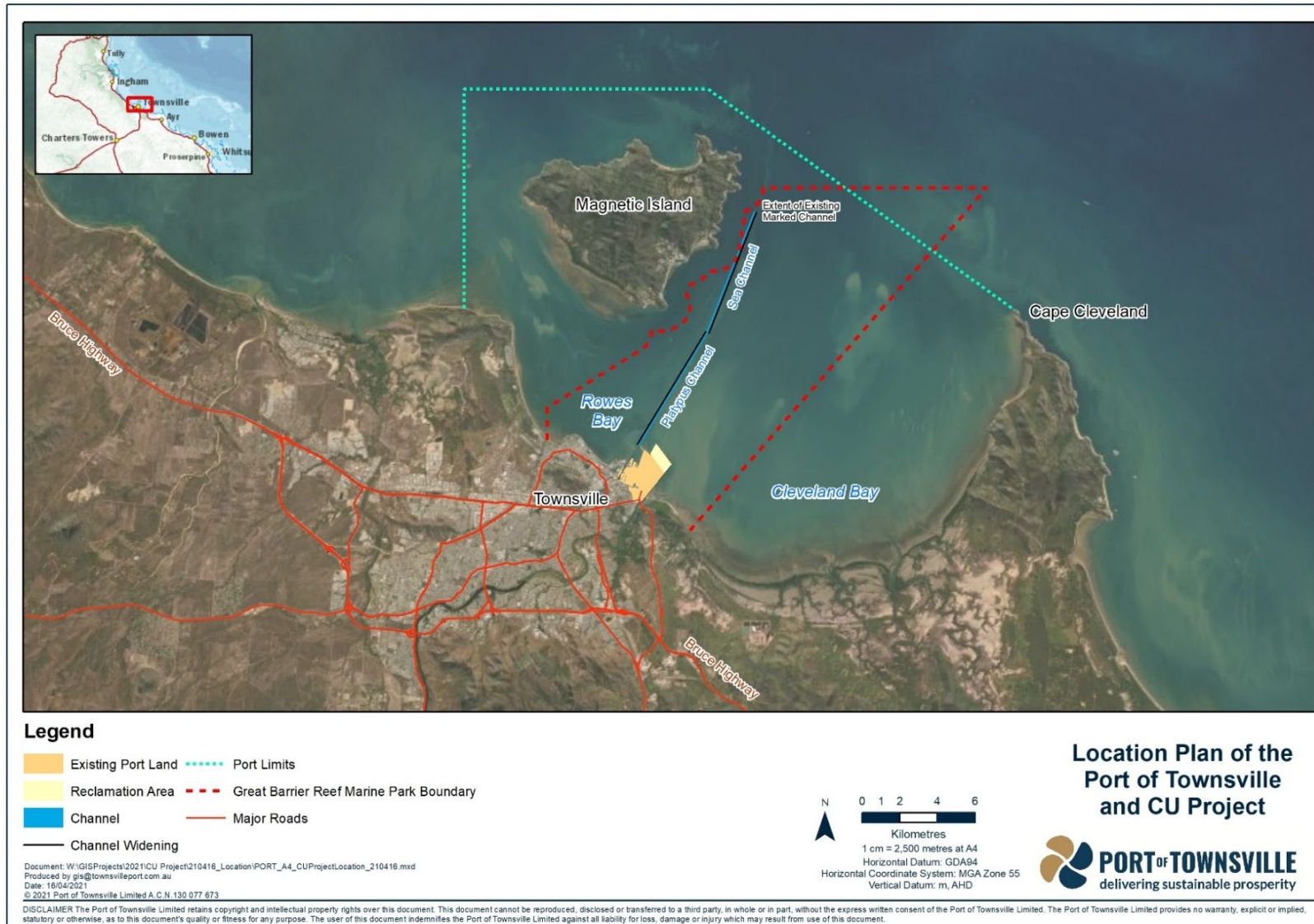
The capital dredge campaign will last approximately 2 – 2.5 years and dredge approximately 3.9 million cubic metres from the channels using a mechanical dredge. All the capital dredge material will be placed within the new reclamation area as part of land reclamation activities. Dewatering and ground improvement of emplaced sediments within this area will be undertaken.

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A Marine Environmental Management Plan (MEMP), detailing appropriate environmental management controls, is in place to manage risk and reduce the potential for negative impacts on the marine environment associated with the CU Project 's construction activities. This IMP Monitoring Plan forms part of the MEMP and outlines the environmental monitoring requirements associated with invasive marine pests.

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



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



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1.1 LEGISLATIVE OVERVIEW

The PEP was the subject of an Environmental Impact Statement (EIS) and a further Additional Information to the Environmental Impact Statement (AEIS), submitted in support of Commonwealth and State project approval applications.

Commonwealth approval (EBPC 2011/5979) under the Environment Protection and Biodiversity Conservation Act 1999 for the PEP was granted on 5 February 2018. This approval prescribes conditions relevant to the development and implementation of an Invasive Marine Pest Monitoring Plan, as outlined in Table 1.

Table 1: References for EPBC Approval Conditions

REF	COND. NO.	CONDITION REQUIREMENT	DEMONSTRATION OF HOW THE PLAN ADDRESSES CONDITION REQUIREMENTS AND COMMITMENTS MADE IN THE PLAN TO ADDRESS CONDITION REQUIREMENTS
1	12	<p>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:</p> <p>(f) 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);</p>	This monitoring plan, as an attachment of the Marine Environment Management Plan, and its implementation, fulfils the requirements of this condition.

This Invasive Marine Pest Monitoring Plan has been developed cognisant of legislative requirements set out in International agreements and applicable Acts and Regulations, including Acts implementing relevant international conventions where relevant, including the following:

International Legislation and Guidelines

- International Maritime Organisations (IMO) – *International Convention for the Control and Management of Ships' Ballast Water and Sediments*
- *Convention on Biological Diversity* – specifically identifies the need to “control or eradicate those alien species which threaten ecosystems, habitats or species”
- United Nations *Convention of the Law of the Sea* – specifically “protection and preservation of the marine environment”

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Legislation and Guidelines

- *Biosecurity Act 2015 (Cth)*
- *Biosecurity Act 2014 (Qld)*
- *Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act) (Cth)*
- *Protection of the Sea Act 1981 (Cth)*
- *Fisheries Act 1994 (Qld)*

In order to minimise the risk of the introduction, establishment and spread of invasive species, the Australian Government has introduced biosecurity policies and practices. The Australian Government has also developed an Invasive Marine Species Program to reduce and control the risks of Invasive Marine Species incursion from foreign shipping.

1.2 PURPOSE & OBJECTIVES

The dredging via mechanical dredge and movement of dredged material via barge to the reclamation area has the potential to introduce invasive marine pests to the waters of Cleveland Bay.

There are several potential vectors by which non-indigenous species may enter domestic waters, however it is thought that most species are unintentionally introduced through shipping movements, either in ballast waters or from biofouling on the hull of vessels or in niche areas such as internal seawater systems. The risk of vessels becoming colonised by invasive marine pest species varies depending on vessel type (e.g. dredge, barge, cargo vessel etc.), the number of niche areas present, the vessel history (e.g. previous locations, time at locations, frequency of biofouling application, frequency of cleaning etc.) and importantly, whether or not the vessel regularly makes contact with the seafloor.

This CU Invasive Marine Pest Monitoring Plan is designed to:

- Conduct surveillance monitoring for invasive marine pests within or adjacent to the CU site in a consistent manner which meets the requirements of the appropriate environmental approvals and any standards; and
- Augment the broader Port of Townsville Invasive marine pest monitoring arrangements to ensure monitoring is consistent across the whole port jurisdiction; and
- Provide a process for early identification of potential invasive marine pest detections; and
- Identify areas of concern which may necessitate different management controls to address invasive marine pest detections.

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2 EXISTING ENVIRONMENTAL VALUES

2.1 INVASIVE MARINE PESTS

Invasive Marine Pest Species (IMP) are animals and plants that are able to survive, reproduce and establish populations in regions that they have been introduced to which would normally be beyond their natural range. Human activities can result in the translocation of marine pests, causing damage to Queensland's valuable industries, resources, environment and community, resulting in significant economic burden. Marine pests can travel vast distances attached to vessels as biofouling or living in internal seawater systems such as bilge water, ballast water or water intake pipes. As is the case with biological competition, not all marine species introduced to an area will be capable of establishing a colony, and as such not all marine species are classified as a pest.

In order for IMP to be introduced to an area, it must meet several key requirements:

- Infection of a vessel in waters where IMP (native and non-native species) are present and reproducing;
- Survival of the IMP organism during the voyage to an area that is located beyond their natural range;
- Successful inoculation by the IMP; and
- An environment matching the requirements of the IMP, allowing their survival, establishment, growth and reproduction.

The capabilities of IMP to spread have numerous potential risks to social, economic and environmental values. An established IMP population is often unfeasible to eradicate, which limits options for control or impact minimisation. Therefore, preventing IMP establishment and reducing chance of introduction is the most effective and cost-efficient method of managing the risk.

2.2 INVASIVE MARINE PESTS IN THE TOWNSVILLE PORT REGION

More than 250 non-indigenous marine species have been recorded in Australian waters (NIMPCG, 2011).

There are several potential vectors by which non-indigenous species may enter domestic waters, however it is thought that most species are unintentionally introduced through shipping movements, either in ballast waters or from biofouling on the hull of vessels or in niche areas such as internal seawater systems.

In North Queensland, Asian green mussel (*Perna viridis*) are considered to be a potential threat in tropical waters, was found on a vessel's hull at Cairns Harbour in 2001 and Caribbean tubeworm (*Hydroides sanctaecrucis*) has also been introduced there (Souter, 2009). The Asian Green Mussel is an invasive marine pest that could out-compete native mussels and disrupt the aquaculture industry by introducing harmful parasites and diseases; disrupt industry and service providers by blocking pipe inlets and discharge points; disrupt commercial and recreational boating activities; and impact on the Great Barrier Reef Marine Park.

A port wide baseline survey of non-indigenous marine species was undertaken in 2000 and recorded over 1300 organisms. However no targeted marine pest species (as defined by the Australian Ballast Water Management Committee at that time) were recorded (Neil, Sheaves, Cruz, Hoedt, & Choat, 2001). A range of species that resemble non-indigenous species were recorded in the baseline survey, however none of these potential non-indigenous species were considered to represent a serious pest in Australian waters.

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More recently, POTL undertook two biosecurity monitoring surveys in October 2017 and March 2018 following Asian Green Mussel detection on the hull of a Naval vessel and to assist Department of Agriculture and Fisheries (DAF) conduct surveillance monitoring for potential pest species within the Port of Townsville. Settlement plate arrays were established at two inner harbour locations and checked at six monthly intervals. No suspect or suspicious species were found through visual inspections of these arrays (POTL, 2018).

The Port implemented a marine pest pilot program for 2019-2020, marine biosecurity early detection program established through the Queensland Seaports E-DNA Surveillance (Q-SEAS) regime. This pilot program partnered with Queensland Biosecurity, Department Agriculture and Fisheries and other Queensland Ports to trial a new approach using DNA analysis to identify species within the port. This program included the deployment of four (4) frames in the strategic locations across the Port and improves the ability and speed of detection if a marine pest species manages to slip through the existing controls in place by both the state and federal governments. Following completion of the pilot program, the Port has continued to implement the QSEAS arrangements at strategic locations across the Port for early detection of potential incursions.

A current list of Invasive Marine Species of Concern advised by Biosecurity Queensland is at Appendix A.

The PEP AEIS identified potential impacts from Invasive Marine Pest resulting from the Project and proposed mitigation measures as listed in the table below.

Table 2: Summary of Invasive Marine Pest Impacts and Mitigations Measures

ELEMENT	PRIMARY IMPACTING PROCESS	RISK ASSESSMENT			MITIGATION MEASURES	MITIGATED RISK RATING
		MAGNITUDE	LIKELIHOOD OF IMPACT	RISK RATING		
Marine Pests	Increased potential marine pest introductions	High	Possible	Medium	Implement State and Commonwealth biofouling and ballast management requirements	Medium (possible)

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3 INVASIVE MARINE PEST MONITORING

The IMP monitoring program will be multi-faceted across different inspection and monitoring programs.

3.1 INSPECTION PROGRAM

Visual inspections and monitoring for IMPs in association with the CU Project will be completed as follows:

1. Pre-mobilisation inspections:
 - Where required based on a pre-deployment risk assessment, the D&R Contractor will conduct pre-mobilisation inspections on all vessels (as warranted) prior to arrival to site. This monitoring will be to ensure that no biofouling posing a potential marine biosecurity hazard to Townsville is present on vessels allocated to the Project, that marine growth prevention systems are operating effectively, and that all material which may transport organisms (sediments, organic material, or waters) have been removed.
 - Inspections will be conducted on all D&R marine plant and equipment prior to and on arrival to site to ensure that it is free from IMPs.
 - Ongoing visual inspections will be undertaken on all D&R marine plant and equipment based on the IMP risk assessment outcomes, and if deemed warranted, divers will be utilised to conduct underwater inspections of vessels and/or marine equipment.
2. Vessel and Equipment Audits:
 - Audits are to be conducted by the D&R Contractor on all third-party vessels and equipment (including all equipment used for Piling Operations) prior to arrival on site and/or utilisation on the project to ensure that the vessels:
 - have been thoroughly cleaned,
 - maintenance records are in place; and
 - the vessel records are compliant with the National Biofouling Management Guidelines for Non-Trading Vessels (DAFF 2009) and the Australian Ballast Water Management Requirements (2020).
3. Sheet Pile Wall inspection:
 - The newly constructed TUF sheet pile wharf and/or area immediately adjacent will be subject to periodic surveillance to check for the presence of IMS in the project area.
 - This surveillance will be conducted biannually, with the inspections to be undertaken if no surveillance arrays are in place at the TUF.
 - Surveillance arrays will be established and checked, with a particular focus upon detecting the presence of white colonial sea squirts.
4. General Inspections:
 - Inspections will be conducted weekly as part of the D&R Contractor's Site Environmental Inspections and monthly (as part of the projects HSEQ Auditing schedule and Monthly Site Inspection Checklist) for the spread of Invasive Species.

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3.2 IMP MONITORING PROGRAM

The formal IMP monitoring program for the CU Project has been developed to nest in with the whole of Port IMP monitoring program, building on and extending that program by including monitoring locations in the high risk areas for IMPs from CU project activities.

This program is based on the outcomes of the Queensland Seaports E-DNA Surveillance (Q-SEAS) marine pest pilot program in 2019-2020, with the methods adopted incorporating collection of DNA and environmental DNA (eDNA) from marine samples at each monitoring location. Specific aspects of the IMP program are as detailed below.

1.1.1 Equipment

Settlement arrays will be used to target predominantly sessile organisms in which their larvae can settle on the plate substrate. Settlement plates attached to arrays are deployed into the water at a depth of approximately 1 meter below the surface at low tide. The main frame of the array is free-running along a vertical rope and has at least one buoy at the top of the frame to provide buoyancy and to maintain the plates at a constant depth of 1 m below the water line throughout the tidal cycle. Each array has a number of settlement plates (PVC plates) arranged in two different orientations – vertical and horizontal (Figure 3).

Figure 3: Settlement plate array arrangement (Berth 11 and Temporary Unloading Facility)

Berth 11:



Temporary Unloading Facility:

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1.1.2 Monitoring Locations

The IMP field monitoring was conducted at two locations (Figure 4), which have been selected to represent key at risk sites for invasive marine species from the CU Project.

The two current locations for IMP monitoring, as key risk sites for IMPs sourced from the Project activities, are:

- Berth 11 – a site adjacent to the unloading area for the Project and the passage of the barges moving to and from the unloading area; and
- Temporary Unloading Facility – an array hung from the small craft gangway at the unloading facility.

The TUF site was established in July 2023 following the installation of infrastructure that allowed the array to be deployed and hung from.

The third site was in the duckpond to the west of the Diagonal Breakwater construction footprint. This site was decommissioned in September 2022 on the basis that the project would not progress with the diagonal breakwater works – with works to the breakwaters in that area, the Duckpond location was no longer a key risk area from the Project.

GPS co-ordinates for all monitoring locations are included in Table 3.

These monitoring locations will be in operation as relevant for the CU Project activities and will be ceased once no longer applicable. Additional monitoring locations may also be added where deemed necessary or informative for the CU Project activities.

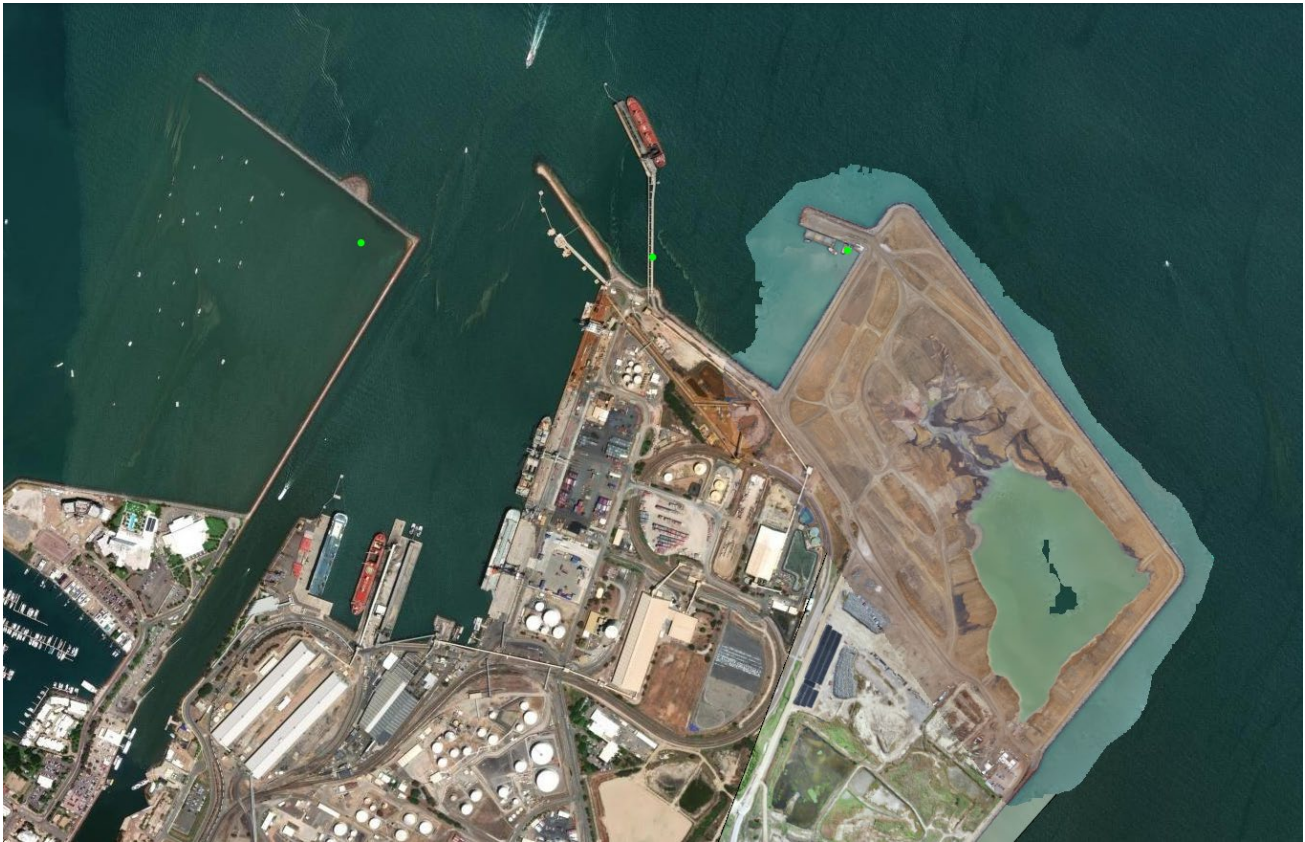
Table 3: Invasive Marine Pest Monitoring Locations

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MONITORING LOCATION NAME	MONITORING LOCATION TYPE	MONITORING LOCATION COORDINATES	
		LATITUDE	LONGITUDE
Berth 11 (03/12/2020 – current)	Settlement plate arrays	19 14'41.35" S	146 50'17.16" E
Duckpond Dec 2021 – Sept 2022	Settlement plate arrays	19 14'39.88" S	146 49'53.69" E
CU Project Temporary Unloading Facility (July 2023 – current)	Settlement plate arrays	19 14'40.31" S	146 50'33.04" E

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Figure 4: Monitoring Locations for Invasive Marine Pests



Green dots identify IMP monitoring locations

1.1.3 Frequency & Timing

Settlement arrays are deployed for a two month period twice per year, corresponding to a summer and a winter monitoring period. For the summer sampling period, arrays are deployed from December to February, while the winter sampling period will be from July to September. This is consistent with the QSEAS program in operation across the broader Port, and with the SWASP program that is implemented in Western Australian Ports.

Arrays were deployed prior to relevant CU Project construction activities occurring, with the first array deployment in December 2020 at berth 11. TUF construction commenced in August 2021, with Piling activities mobilizing from 16 August 2021 (during second array deployment period).

As noted above, the Duckpond monitoring location was ceased in September 2022 with the decision to no longer progress with the Diagonal Breakwater works.

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1.1.4 Sample Analysis

On retrieval of the settlement plate arrays, photographs and field notes regarding the fauna and flora on the plates are taken and plates labelled appropriately. Retrieved plates were frozen and stored at Port facilities and then transported to Laboratory (eDNA frontiers in Western Australia) for analysis.

At the laboratory, the settlement plate material is removed and pooled with DNA extracted using a commercial tissue genomic DNA extraction kit. This process characterises DNA barcodes from all organisms in the samples and provides a rapid biodiversity assessment for the environment. The final DNA sequences are compared against the publicly available and in-house DNA sequence libraries, to determine presence and absence of target invasive marine pests.

1.1.5 Quality Assurance/Quality Control

The IMP monitoring program will be implemented with a high level of quality, by taking the following steps:

- Use properly trained and experienced staff to coordinate and implement the monitoring plan
- Ensure that equipment utilised in the collection of data is regularly calibrated (if required)
- Conduct monitoring in similar weather conditions.
- Use and properly maintain appropriate calibrated monitoring equipment, including cleaning of equipment between locations.
- Use proper monitoring techniques in accordance with relevant guidelines (i.e. Queensland Seaports E-DNA Surveillance (Q-SEAS) marine pest pilot program 2019-2020 Technical Guidelines; the Australian Marine Pest Monitoring Manual (version 2.0, 2010)), including clear and accurate labelling of sample containers and completion of field record sheets.
- Follow sample preservation and handling procedures and supply samples to the relevant testing body within nominated holding times with accurate chain of custody forms.

Additionally, POTL implements the following recognised procedures:

- ISO 9001:2016 Quality Management Systems;
- ISO 14001:2015 Environmental Management Systems.

4 REPORTING

The Port will take responsibility for coordinating the implementation of this monitoring plan, with the assistance of suitably qualified contractors/consultants where required.

The Port will produce summaries of the monitoring results from the CU Invasive Marine Pest Monitoring Program as required. Copies of all finalised report(s) will be kept on-site and will be available for regulatory inspection. If requested by the regulators, all monitoring data and information related to this monitoring program will be submitted within 30 business days of the request, or within a timeframe agreed in writing between the Port and the relevant regulator.

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Any monitoring summaries will also be referenced as part of annual reporting and review of the MEMP and for compliance reporting against the EPBC Act Approval conditions.

Should the IMP monitoring or visual inspections of plant and facilities identify actual or potential presence of IMPs, this presence will be reported to the DAF (Biosecurity Queensland) for further investigation and response. The Port and the D&R Contractor will engage with the Biosecurity regulatory agencies to further investigate, monitor and respond to any introduction or spread of invasive marine species.

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5 CONTINUOUS IMPROVEMENT

This Invasive Marine Pest Monitoring Plan will be subject to regular review. It will undergo formal review annually during the construction phase as part of the MEMP review (in association with the Annual Compliance Reporting function).

This IMP Monitoring Plan is a “living document” which will be reviewed at least annually following commencement of the construction works for the CU project (in association with the MEMP review for Annual Compliance Reporting function). This review will be conducted by the CU Environment Manager and/or Environment Advisor. During delivery, review and amendment will occur as necessary via adaptive management actions to ensure it remains fit for purpose and achieves the required program objectives; including identification and implementation of any new or changing environmental risks and mitigation action outcomes. Recommendations on improvements or amendments are to be reported as part of the annual reporting process.

Changes to the monitoring plan 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 Project Management before implementation.

Continuous improvement will also be achieved via the Marine Environmental Management Plan, to which this plan is a part of (Appendix H of MEMP). Information from this Plan will be used to assist with improving the control measures in the MEMP, with improvements to the MEMP reflected within this Plan.

6 REFERENCES

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APPENDIX A

INVASIVE MARINE SPECIES OF CONCERN

Species Name	Common Name
<i>Perna viridis</i>	Asian Green Mussel
<i>Arcuatula senhousia</i>	Asian Bag Mussel
<i>Mytilopsis sallei</i>	Black Striped Mussel
<i>Perna perna</i>	Brown Mussel
<i>Eriocheir sinensis</i>	Chinese Mitten Crab
<i>Rhithropanopeus harrisi</i>	Harris Mud Crab
<i>Undaria pinnatifida</i>	Japanese seaweed
<i>Didemnum perlucidum</i>	White colonial sea squirt*
<i>Magallana bilineata</i>	Black scar oyster*

* Invasive marine pest species that are established in Queensland waters.

Species list based on Department of Agriculture and fisheries (Qld) IMP Pilot study target species list and current biosecurity concern information (<https://www.qld.gov.au/environment/coasts-waterways/marine-pests>).

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