Port of Cairns

Permit Application for Continuation of Maintenance Dredging Activity and a New Placement Area

Public Information Package

Purpose

We now seek any public comment under Section 93 of the *Great Barrier Reef Marine Park Regulations 2019* (Cth) and section 15 of the *Marine Parks Regulation 2017 (Qld)*. Public submissions will be considered by the Great Barrier Reef Marine Park Authority and Department of Environment and Science (the Managing Agencies) in making a decision on this permit application. Comments will not be regarded as confidential unless confidentiality is specifically requested. Due consideration will be given to public comments before the Managing Agencies make any decisions in relation to the proposed use. The applicant may be provided with a copy of, or summary of, the comments received.

Submissions

All comments and submissions must be made in writing by the 1 October 2021, and should be forwarded to:

Great Barrier Reef Marine Park Authority
Environmental Assessment and Protection Unit
PO Box 1379
Townsville QLD 4810

Website:
gbrmpa.gov.au/about-us/consultation

or Email:
Consultation-EAP@gbrmpa.gov.au

Please ensure the submission identifies **Reference Number: G44236.1.**

Ports North

Contents

List of Figures

List of Tables

Message from the CEO

Chris Boland
CEO, Ports North

Ports North owns and operates nine ports in Far North Queensland (FNQ) which are essential to the economic well-being of the region and in connecting remote communities in the Cape York Peninsula, the Gulf of Carpentaria and Torres Strait Islands.

The Port of Cairns is the vital node from which this network of ports operates. Its Reef Fleet Terminal, Cairns Marlin Marina and International Cruise Liner Terminal support Cairns' status as a premier tourism destination. The Port's industrial area - the Cairns Marine Precinct - services a growing defence sector and is supported by one of the biggest collection of ship repair businesses in Queensland. A major commercial fishing fleet is also based at the Port.

To ensure ongoing prosperity, Ports North must look after its waterways and marine infrastructure, just as land-based infrastructure, such as road and rail, is maintained. This is consistent with our vision to be a "successful, sustainable port operator and a valued contributor to regional economic growth".

The inshore environment at the Port of Cairns is naturally turbid with large volumes of marine sediment being resuspended in the water column on a daily basis. Every year our berths, swing basins and shipping channels are filled this sediment, which is transported by waves and currents from surrounding shallower areas. This reduces depth which in turn poses a safety risk to vessels entering and exiting the Port.

This is why we dredge and relocate the sediments. It is an essential part of Port operations since the late 19th century.

We have a long history of successfully delivering annual maintenance dredging campaigns at the Port of Cairns. In recognition of this, it was the first port in Australia to obtain a 10-year permit for maintenance dredging activities in 2010. This permit will expire in mid-2022 and we are now seeking a new 10-year permit.

To support this application, Ports North has prepared a new Long Term Maintenance Dredging Management Plan (LMDMP).

It builds on the historic investigations at our Port over many years. It presents the results of a considerable number of studies, captures valuable feedback from stakeholders and presents a leading-practice framework for the long term management of dredge sediment.

We have also worked closely with regulatory agencies to ensure that the LMDMP aligns with the Queensland Maintenance Dredging Strategy, the Federal Government's Long Term Monitoring and Management Plan Information Requirements and the Great Barrier Reef Marine Park Authority's permit requirements.

The LMDMP has also been developed in consultation with a Technical Advisory Consultative Committee (TACC) consisting of representatives from the Commonwealth, State and local government; port users; and environmental/conservation and community interest groups.

This Public Information Package is designed to summarise this work and assist stakeholders who want to understand more about maintenance dredging at the Port of Cairns.

1. Summary

Ports North is applying for a 10-year permit from the Great Barrier Reef Marine Park Authority (GBRMPA) to undertake maintenance dredging of the navigational channel, swing basin and berthing pockets at the Port of Cairns and placing this dredge material within the Great Barrier Reef Marine Park (GBRMP). This is a continuation of activity undertaken in accordance with Marine Park Permit (G10/33155.1) and Sea Dumping Permit (SD10/03) which have been in effect over the 10-year period since 2010.

For the past 10 years, maintenance dredging has been necessary at least annually for the channel and sometimes more frequently for the inner port areas to maintain the depth of the navigational channels and allow safe access to vessels. This material has been placed offshore, at a location that is naturally retentive (i.e., the material largely remains where it has been placed and does not disperse).

The existing approved placement area at sea is almost full and cannot continue to be used indefinitely. As part of the approval process, Ports North has undertaken an assessment of a range of options to avoid, reduce, or minimise maintenance dredging. It has also reviewed whether there are alternatives to placing dredge material at sea. It was found that at-sea placement is the most viable option given the volume and composition of the material that is typically dredged. The permit application therefore includes a new placement area immediately adjacent to the existing approved site.

2. Description of the Location and Activity

2.1 About the Port of Cairns

The Port of Cairns is the main trading port managed by Ports North. It is a multipurpose regional port comprised of two main precincts, a northern tourism precinct and a southern trade and industrial precinct. The Port currently provides maintained depth facilities for a range of industries and services including the following:

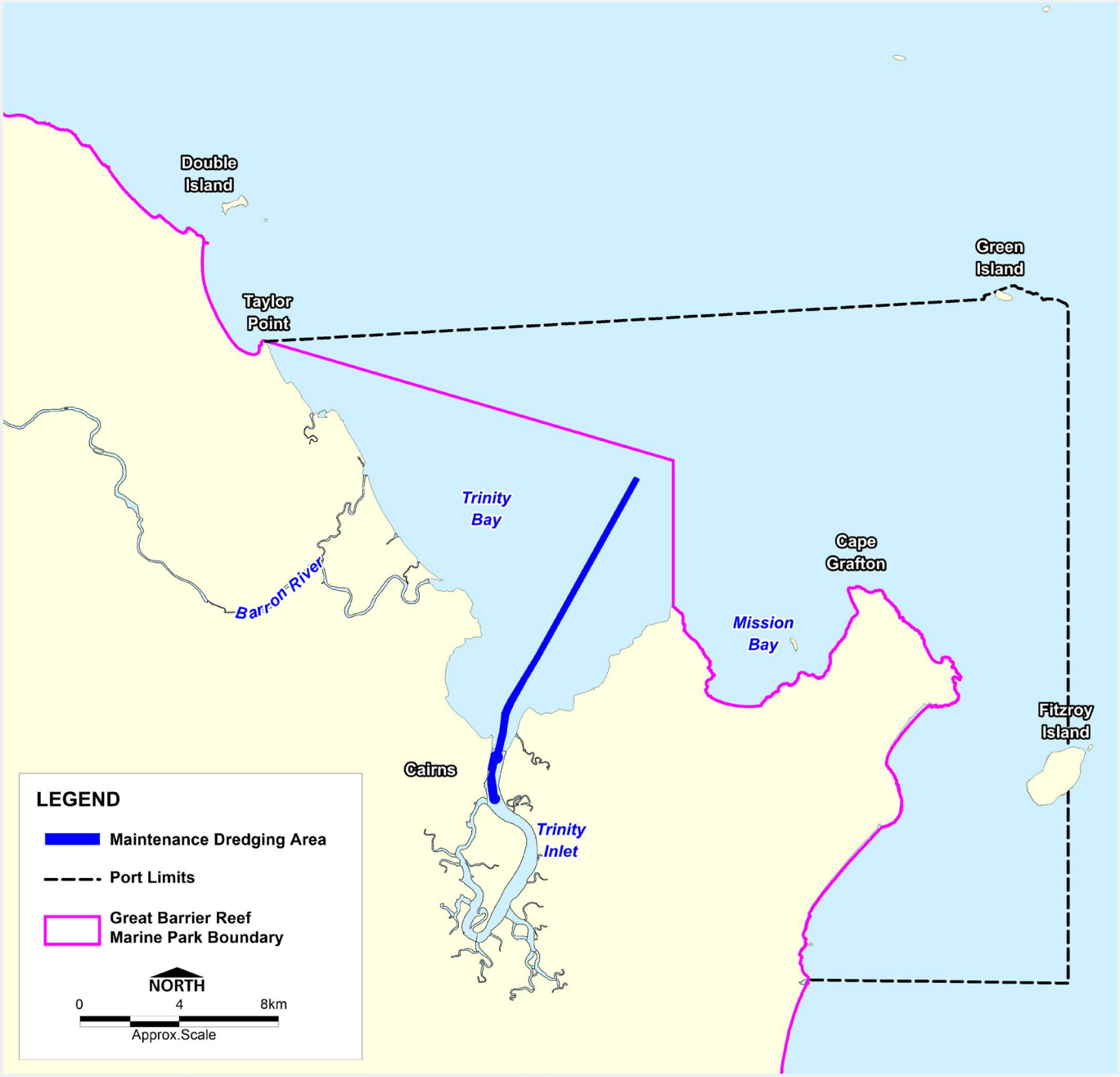
- The Marlin Marina complex which has 261 pontoon berths for game fishing, dive, recreation, and tourist ships up to 80m LOA (Length Overall) as well as 30 reef fleet berths and 10 berths for super-yachts.
- Ten commercial shipping wharves accommodating cruise shipping, general cargo, bulk cargo, fertiliser, fuel and gas imports and sugar and molasses exports.
- A range of small wharves and ramps providing essential barge supply services to Cape York and Torres Strait communities as well as local islands.
- Two commercial fishing bases with mooring facilities for 89 ships.
- The Royal Australian Navy base, which is used by patrol boats, hydrographic survey ships and landing barges.

The Port operates 24 hours a day, seven days a week, with activities concentrated around the mouth of Trinity Inlet and Smiths Creek adjacent to the City of Cairns.

The maritime areas of the Port are located within the Great Barrier Reef World Heritage Area (GBRWHA) and adjacent to the Great Barrier Reef Marine Park (GBRMP). While the navigational channel itself is not within the GBRMP limits, both the existing and proposed placement areas are located within the General Use Zone.

The location of the Port of Cairns is shown in **Figure 1**.

Figure 1 Location of Port and Port Limits

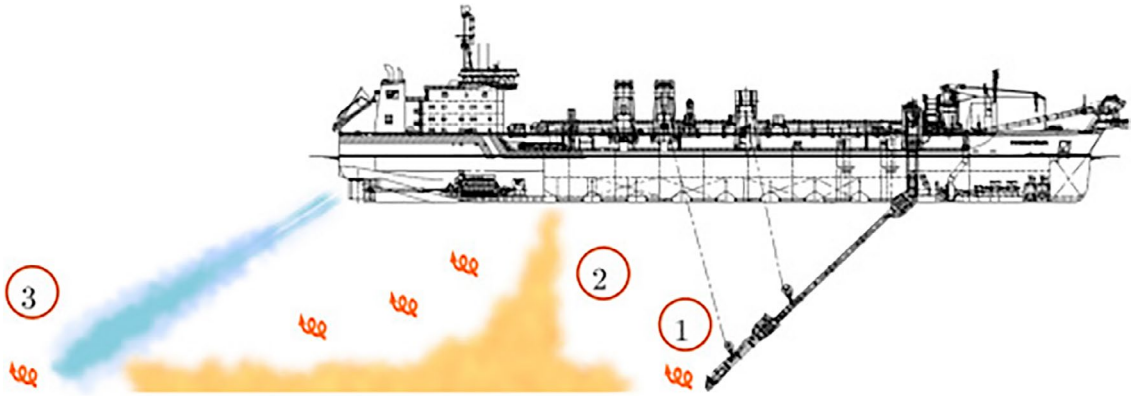


2.2 Maintenance Dredging Method

Consistent with past practice, the majority of dredging will be conducted by the *Brisbane*, a Trailer Suction Hopper Dredge (TSHD). It undertakes dredging of the navigational channel and the swing basins on an annual basis. The *Brisbane* (shown in Figure 2) is fitted with a high standard of environmental management features and has a hopper capacity of 2,900 cubic metres. A TSHD uses a drag head, equipped with suction tubes to pump or suck up sediment from the seafloor. A mixture of sediment and water is held in the vessel 'hopper'. Once the vessel hopper is full, the vessel sails to the approved placement area, and releases the material from the hopper via bottom doors which open during disposal. Sediment plumes are created either by the drag head disturbing the seafloor, overflow from the hopper or from propeller wash, as illustrated in Figure 3.

Figure 2 The TSHD *Brisbane*, which undertakes the majority of maintenance dredging in Cairns (and other Queensland ports) (Source: Ports North)

Figure 3 Sources of turbid plumes from a typical TSHD: 1. drag head, 2. overflow and 3. propeller wash (Source: Becker et al, 2015)



For the foreseeable future, maintenance dredging will be undertaken by the following vessels:

- **TSHD *Brisbane*** – this vessel is expected to continue to undertake dredging of the navigational channel and swing basins for the next 10 year period.
- **Grab dredge *Willunga*** – this small grab dredge supported by two hopper barges is operated by Ports North and used for inner harbour and berth pocket dredging. It typically only performs a small fraction of the overall volume of maintenance dredging, as part of routine, ad-hoc requirements.
- **Bed leveller** – a bed leveller is used in conjunction with the dredges to level out any high spots or ridges remaining following a maintenance campaign.

2.3 Dredge Material Placement

Currently, maintenance dredge material is placed at sea approximately 14km north of the Cairns Port entrance. The approved placement site is one nautical mile in diameter and covers an area of approximately 270ha. This site has been largely used for placement of maintenance dredge material and minor volumes (120,000 m^3) of capital dredge material from the Port since 1990. The site occurs over a depth range from -9 m Lowest Astronomic Tide (LAT) to -15 m LAT with an average of 13m depth below datum.

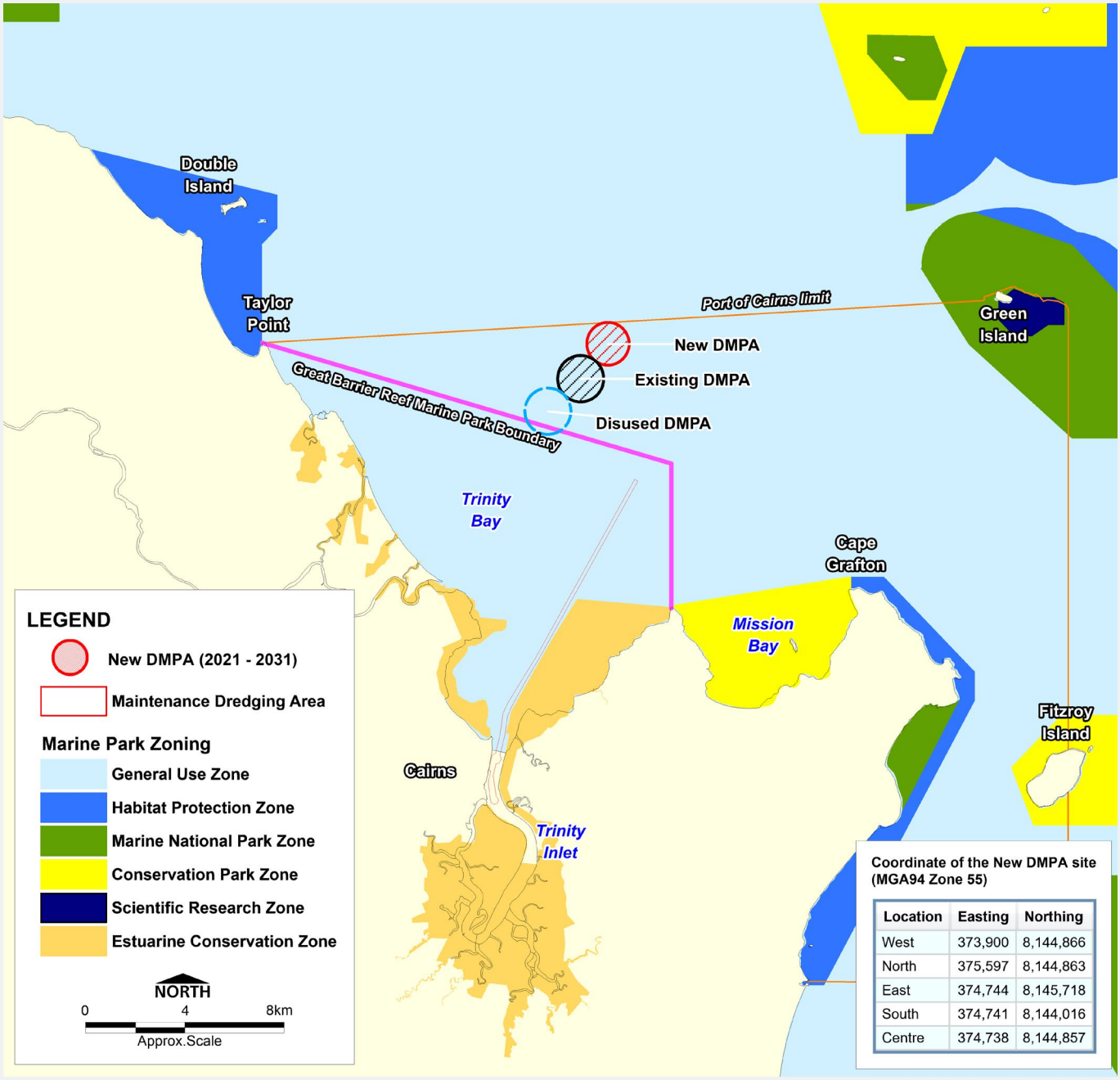
Successive depth surveys of the existing placement site undertaken by Ports North have highlighted that the material remains on site and does not disperse to the surrounding environment after cyclone events. Recent surveys show the site is becoming shallower at an average rate of 12-13cm/year. The raised surface can become a navigational hazard as under-keel clearance reduces, particularly during low tide conditions, which increases the risk of material dispersing to the surrounding environment.

Given this and other criteria including environmental, social, and economic factors, a preferred site near the existing placement site has been proposed. The new placement site is immediately adjacent to the existing site (as shown in Figure 4) and is expected to provide adequate capacity for at least another 30 years of maintenance dredge material placement.

The proposed new placement location has the following favourable characteristics:

- It is within Port Limits, which allows the Port to closely monitor and control navigation and anchorage in surrounding waters.
- It is away from shipping lanes, which limits impact to navigational safety within the Port.
- It is a considerable distance from sensitive environmental receptors including Reef islands and inner reef (14.5km), Double Island Reef (14.5km), Cape Grafton seagrass beds (14.1km) and Rocky Island Reef (13.1km).
- An ecological survey of the proposed new site in 2020 confirmed there are no seagrass, coral reef features, or other hard substrates that could support fish aggregation within the site footprint.
- It is located in an area with an average depth of -16.5m below LAT and will retain material more effectively than the current site.
- Because the site is deeper, the total surface area has been reduced (16% less than the current site), which will marginally reduce temporary habitat disturbance during the placement of material.
- It avoids areas that are utilised for offshore commercial fishing and by the tourism industry.
- Placement is not expected to impact on the visual amenity of other marine and coastal uses or users due to the distance between the site and areas of recreational use.

Figure 4 Location of Disused, Current, and Proposed DMPAs



Location	Easting	Northing
West	373,900	8,144,866
North	375,597	8,144,863
East	374,744	8,145,718
South	374,741	8,144,016
Centre	374,738	8,144,857

2.4 Maintenance Dredge Material Volumes

The future maintenance dredging requirements for the 2021-2031 planning period are summarised in Table 1. These estimates are based on analysed trends and observations in siltation and accumulation over many years, review of progressive sea floor survey results, and Ports North's extensive knowledge and experience in managing maintenance dredging campaigns.

Table 1 Summary of Volume and Quantities for Dredging and Placement under new 10-year permit (2021-2031)

	Volume (Dry Tonnes)	**Quantity** (In-situ cubic metres)
Annual Average Dredging Quantity (average only)	365,000	520,000
Maximum Dredging Quantity that can be taken in any given year (excluding contingency)	500,000	730,000
Contingency Dredging Limit (spread across the 10 year permit)	500,000	730,000
Total requirement for 10-year permit duration	**3,650,000**	**5,200,000**

Minor increases in volumes are expected as a result of:

- The widening and deepening of the channel in 2019 to accommodate larger cruise ships.
- Provision for future maintenance of any small-scale capital dredging works permitted under the *Sustainable Ports Development Act 2015* that could be undertaken over the period through to 2031.
- The likely maintenance dredging required for works at the Cairns Navy Base.

Due to the unpredictable nature of extreme weather events in the tropics, the Port of Cairns also requires a contingency volume to enable timely re-establishment and safe operation of Port infrastructure after a cyclone or extreme weather event.

Based on experience of the past 10 to 15 years and the extreme events that have influenced Cairns (e.g. TC Larry, and TC Yasi), the previous contingency maintenance dredging requirement set in the 2010 – 2020 LTMP is considered to be adequate (730,000 in-situ cubic metres or 500,000 dry tonnes equivalent).

However, there is still variability between individual annual dredge programs as the volume of sediment that deposits into the channel changes depending on the weather conditions during the preceding 12 months. For administrative certainty and efficiency, a 730,000 in-situ cubic metres (500,000 dry tonnes equivalent) annual upper limit has been proposed where it is necessary, in some years, to remove a volume of material higher than the annual average amount due to varying weather impacts. As demonstrated over the 2010 – 2020 period, despite the occasional 'high volume' year, the overall quantity has been able to be reconciled and achieved by virtue of corresponding lower annual quantities in some years.

2.5 Timing

Dredging in North Queensland usually occurs between April and November to avoid the wet season (when most channel siltation occurs) and cyclonic periods. However, this can vary depending on the needs of other individual ports that are dredged by the ***Brisbane***. Each year, Ports North works with the other Queensland Ports to consider environmental risks, and develop an annual schedule for the ***Brisbane*** which is published on the Department of Transport and Main Road's website. Dredging of the inner port areas using Ports North's grab dredge ***Willunga*** occurs throughout the year to meet operational requirements and vessel schedules.

2.6 Description of the Dredge Material

The physical and chemical properties of maintenance material dredged at the Port of Cairns have been well studied since the mid-1990s through testing undertaken before each dredging campaign (GBRMPA approve a Sediment Analysis Plan prior to dredging). Material testing has been undertaken annually as a condition of Marine Park and Sea Dumping Permits since 2000.

2.6.1 Physical Properties

Although there are small quantities of sand present in some areas of the site, most of the dredged material consists of silts and clays with a high proportion of fine - grained material. The sediments within the Outer Channel and Inner Port dredge areas are generally 80% silts and clays, and the sediments within all other areas contain approximately 90% silts and clays.

This makes the material very difficult to handle, which significantly limits its use for fill or other beneficial reuse purposes on land.

2.6.2 Chemical Properties

Sediments within the Port of Cairns have been subject to a wide range of contaminant analyses over the years.

These are summarised in a Technical Memo supporting the LMDMP and have confirmed the material is suitable for placement at sea.

The contaminant levels identified over the 10-year period are either stable or decreasing within the inner Port area. The stable trends suggest the contaminant inputs are low and steady and that maintenance dredge material will continue to be suitable for ocean placement.

This stability trend has arisen because of strict land use development and pollution management measures.

Any new development is subject to stringent environmental management measures, of which pollution controls are a key component. All new or upgraded facilities are also subject to Queensland environmental regulations which require potential contamination sources to be licensed and controlled.

In addition, Ports North has a program in place to inspect and monitor environmental compliance of existing industrial tenants as part of its Environmental Management System.

2.6.3 Marine Pests

Maintenance sediments have been tested annually for presence or absence of introduced marine pests over the past 10 years, with a particular focus on three target species: the Asian green mussel (Perna viridis), Caribbean tubeworm (Hydroides sanctaecrucis) and Asian bag mussel (Musculista senhousia).

This annual monitoring has not identified any target marine pest species.

In addition to the annual sediment survey, Ports North works with the Department of Agriculture and Fisheries (DAF) on an early detection monitoring program for native pest families such as fan worms, ascidians, and mussels. There have been no instances of any nationally significant marine pest species becoming established in Trinity Inlet.

This testing regime demonstrates the low risk of marine pests becoming established in maintenance material and being transferred to the placement site within the GBRMP.

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3. Long Term Maintenance Dredge Management

Consistent with the framework shown in **Figure 5**, Ports North adopts a long term approach to the management of maintenance dredging, where planning and execution phases inform each other as part of a continual improvement cycle.

This process is undertaken in consultation with key regulatory agencies and our TACC and is embedded in our LMDMP for 2021-2031. It is also consistent with the Queensland Maintenance Dredging Strategy.

3.1 Dredge Planning

Historic and ongoing studies at the Port have led to a strong understanding of the ambient environmental conditions at the site. As such, Ports North can plan for and manage environmental impacts as well as understand the drivers that influence sedimentation at the Port of Cairns. A summary of the key studies is included in Section 9.

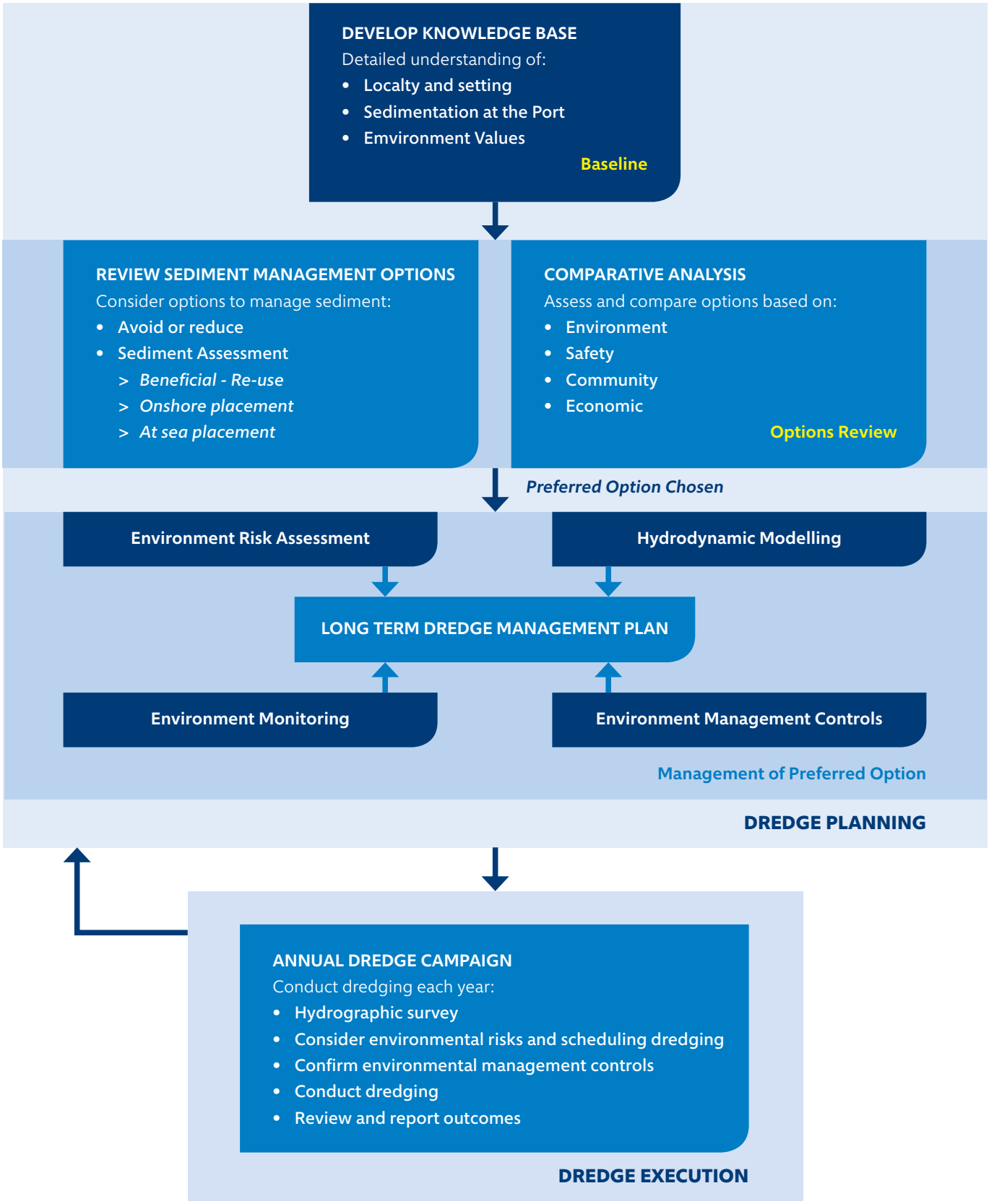
Using this knowledge base, options to avoid and reduce sediment are explored and compared before a preferred dredge management option is chosen.

3.2 Dredge Execution

Before annual dredging activities are carried out, Ports North conducts seabed surveys to confirm whether actual sedimentation of channels and berths is consistent with the modelled prediction. An environmental risk assessment is also undertaken to inform dredge scheduling and to confirm that the environmental management controls are appropriate.

Dredging is then conducted in accordance with these management controls. Once completed, dredging outcomes are reviewed. The information gathered each year adds to Ports North's knowledge base and informs planning activities for subsequent years.

Figure 5 Long Term Maintenance Dredge Management Process



4. Description of Environmental Values

Situated within the Great Barrier Reef World Heritage Area, the Port of Cairns and surrounding areas comprise a diverse range of ecosystems and habitats. Generally, the nearshore areas of Trinity Inlet and Trinity Bay are consistent with a naturally turbid environment and are in a modified condition. Surrounding environmental values have been well studied and sensitive environmental receptors are known and regularly monitored. Trinity Bay supports the following key environmental receptors:

- Coral reefs at Double Island Point and Haycock Reef
- Seagrass meadows at Bessie Point and the Cairns Esplanade, which are monitored annually by James Cook University
- Mangrove habitats which occupy approximately 3,500ha of Trinity Inlet and Bay
- Intertidal and sub-tidal mudflats which support a high diversity of migratory wader bird species
- Habitats for threatened species including marine turtles, whales, crocodiles and dugongs
- Coastal/continental islands

4.1 Coral Reefs

Key reef habitats within Trinity Bay include Double Island Reef, Haycock Reef and Rocky Island Reef. These habitats are a considerable distance away from the channel. Double Island and Haycock Reef are situated approximately 14.5km to the northwest of the channel and Rocky Reef is located approximately 13.1km to the east of the channel in Mission Bay.

4.2 Seagrass Meadows

The seagrass meadows within Trinity Bay have long been identified as sensitive receptors to dredging activity at the Port of Cairns. On behalf of Ports North, James Cook University has been monitoring seagrass health in the bay on an annual basis since 2001. This long-term monitoring program is one of the most extensive seagrass monitoring programs in the world and provides valuable information on the natural variability in seagrass meadows and an on-going indication of the environmental health of the Port.

Seagrass meadows show variations between seasons and years, reflecting changes in regional and local scale environmental conditions. Reductions in seagrass can occur due to natural events such as cyclones and floods or due to human influences. The pattern of change over the 10-year period from 2010 to 2020 indicates no noticeable impact on seagrass condition as a result of maintenance dredging. The large seagrass meadows in Trinity Bay are currently considered to be in their best condition since declines associated with La Nina climate events in 2009 and 2011.

4.3 Marine Fauna

The waters of Trinity Inlet and Bay provide potential habitat for a number of marine fauna species of conservation or economic importance. While the nearshore areas of Trinity Inlet and Bay provide seagrass beds, inshore areas do not support extensive habitat due to elevated turbidity. The area is not recognised as a major nesting area for turtles.

The seagrass meadows represent a potential food source for dugongs, but they are not regularly observed in the channel or inner port areas and occur more toward the Cape Grafton or northern beaches areas. The large areas of mangroves provide habitat for crocodiles *(Crocodylus porosus)* and these have been observed regularly.

Dolphins are regularly sighted along the northern beaches areas but are an uncommon sighting along the channel. Whales (mainly Humpback Whales) are occasionally sighted during the migratory season (between May and September) from the end of the channel to Green Island, but usually in low numbers. Vessel skippers maintain fauna sighting records during maintenance dredging campaigns and there are no records of vessel strike within Port limits.

Observations by Port staff and vessel pilots who are regularly on the water also verify the area has a very low presence of such large marine fauna.

4.4 Water Quality

The nearshore areas of Trinity Bay are naturally turbid environments, especially following periods of high rainfall and sustained winds and currents. This is due to the shallow water depths and muddy sediments which are susceptible to being resuspended in windy conditions. Turbidity levels typically exceed water quality objectives set by the Queensland Government and average between 5 and 50 NTU.

Ports North has monitored turbidity during several maintenance dredging campaigns. While short duration turbidity spikes were experienced near dredging equipment, turbidity at monitoring locations generally averaged 20-25 NTU over the long term during campaigns which is within the realm of natural variability. Visible plumes were largely confined to the channel itself. Monitoring indicates that while plumes can be visible up to several hundred metres at the placement area, they had dissipated within approximately two hours.

5. Turbidity Modelling

The release of turbid plumes to the environment from both dredging and the placement of material is one of the key impacts of maintenance dredging. A review of past monitoring, together with numerical modelling, has further helped understand potential impacts at and around the new DMPA.

Ports North worked with GBRMPA using its guidelines to develop scenarios that reflect how dredging campaigns are most likely to be conducted, including:

- The amount of maintenance dredging required
- Dredging methods
- The times of the year when maintenance dredging may occur
- The range of wind, wave and current conditions that may be encountered

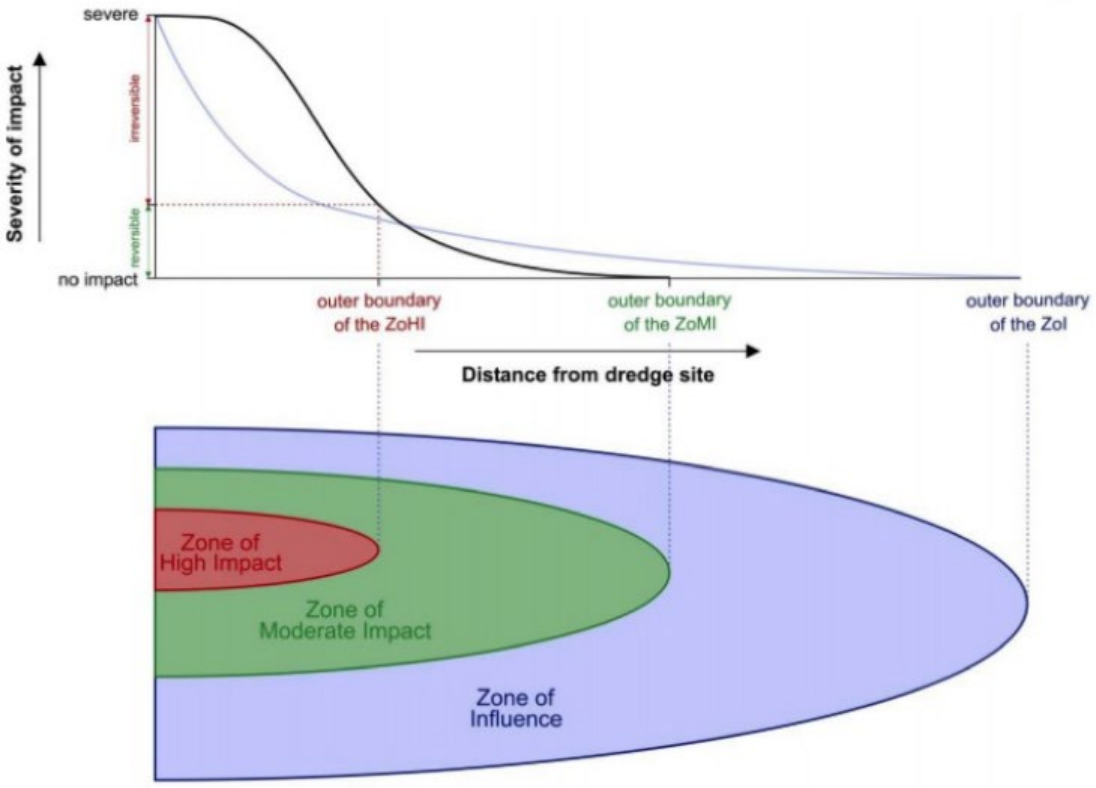
Nine unique maintenance dredging scenarios were defined and assessed using numerical modelling tools. The modelling predicts the magnitude, extent, and duration of turbid plumes for a range of scenarios. The modelling was peer reviewed by the Australian Institute of Marine Science (AIMS) which found the assessments met the GBRMPA guidelines.

Using these results, 'zones of impact' were developed for dredging and dredge material placement. The zones of impact consider:

- The potential increase to turbidity caused by the dredging activities
- The natural variability in turbidity generated by normal coastal processes, often referred to as the 'background turbidity'
- The tolerance of ecological receptors such as seagrass and coral habitats

This method is conceptually illustrated in **Figure 6** and was originally promoted by the Western Australian Environmental Protection Agency. It is recognised as 'leading practice' for dredging environmental assessment in Australia.

Figure 6 Concept design of impact zones (WA EPA 2016)



The zones adopted for the current assessment include the following:

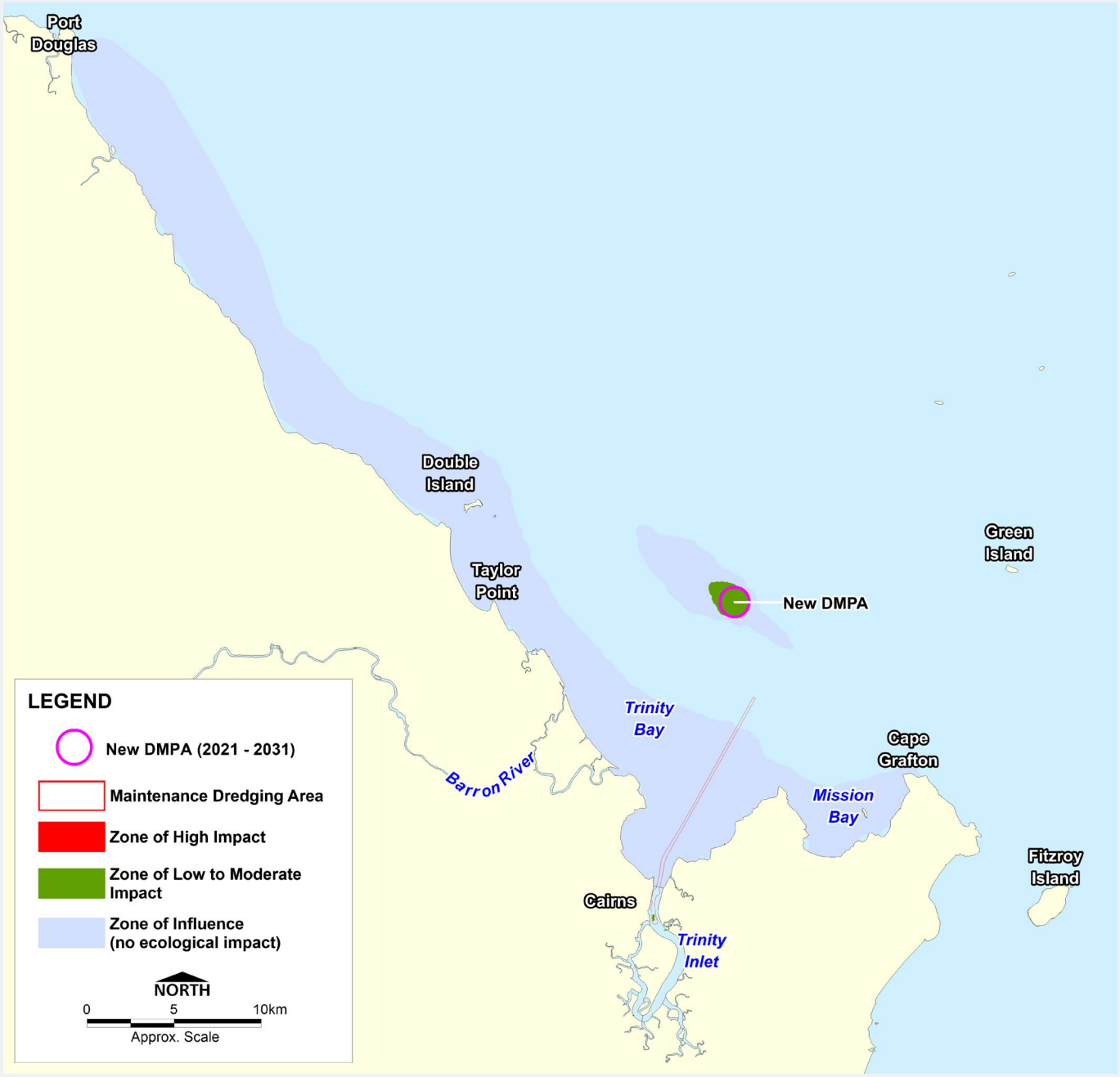
- **Zone of High Impact** = water quality impacts resulting in predicted mortality of ecological receptors with recovery time greater than 24 months
- **Zone of Low to Moderate Impact** = water quality impacts resulting in predicted sub-lethal impacts to ecological receptors and/or mortality with recovery between 6 months (lower end of range) to 24 months (upper end of range)
- **Zone of Influence** = extent of detectable plume, but no predicted ecological impacts

The zones and their recovery timeframes represent a means for comparing the likelihood of significant, detectable impact to sensitive receptors.

The assessed zones of impact associated with maintenance dredging are shown in Figure 7. It is important to recognise that this figure combines the output from all nine modelling scenarios and does not represent a dredging-related turbidity plume at an instant in time. The assessed zones of impact indicate the following:

- Increases in turbidity due to channel maintenance dredging are predicted to cause minor zones of low to moderate impact confined to the dredging footprint or areas immediately adjacent to the dredging locations. There are no zones of low-to-moderate or high-impact in areas of sensitive ecological receptors (seagrass). In other words, turbidity in the nearshore environment where channel dredging would occur is expected to remain within natural variability.
- There is a zone of influence extending out from the channel dredging area along the coast to the north-west. The zone of influence also extends east out to Cape Grafton. This zone indicates the predicted extent of very small increases to turbidity caused by dredging, but where the total turbidity remains within natural variability and therefore ecological impacts are not predicted to occur.
- For dredge material placement at the proposed site, a zone of influence is predicted to extend approximately 6 km north-west and 4 km south-east of the proposed placement site There is also a zone of low-to-moderate impact within and immediately north-west of the proposed placement site.
- There is no zone of high impact.

Figure 7 Maintenance Dredging Zones of Impact



6. Environmental Risk Management

Ports North has used its considerable number of historic environmental investigations as a starting point to conduct specific environmental assessments over the past 18 months as part of this application process to identify key environmental risks and develop measures to avoid, reduce and mitigate those risks to as low as reasonably practicable.

Importantly, the reports supporting this application have identified that ongoing maintenance activities over the next 10 years pose a low environmental risk and will not result in any significant environmental impacts.

Ports North maintains a risk assessment framework that is regularly reviewed and updated every year to reflect environmental monitoring and observations following each major dredge campaign. The risk assessment has been updated to accommodate the period from 2021 to 2031 and the management outcomes embedded within Ports North's LMDMP.

Table 2 summarises each risk and details the long-term monitoring and management activities that will be undertaken to them.

Table 2 Port of Cairns Maintenance Dredging Environmental Risk Assessment

Activity	Partial Risk	Risk Description	Risk Level	Monitoring	Monitoring Description	Timing	
						Annual	Periodic
Dredge material placement	Contamination	• Comprehensive testing of sediments over many years has not identified any contaminants exceeding guidelines. It is not anticipated that there will be a significant change in the contaminant sources or levels over the next 10 years.	Low	Sediment Analysis Plan	Sediment sampling and analysis in accordance with approved plans every three years to identify if there are any contaminants of concern in maintenance dredge material.		Y
Dredging and dredge material placement	Water Quality	• Turbidity generated by dredging and the placement of dredge material is within natural variability and will not significantly impact identified sensitive receptors. • The risk of long-term resuspension of material placed at the proposed site is low due to the depth of the site and its retentiveness.	Low	Baseline ambient water quality across Trinity Bay	Ongoing participation in the Wet Tropics Healthy Waterways Program (WTHWP) monitoring program which measures ambient water quality at set locations.	Y	
				Water quality verification	Visual water quality monitoring adjacent to loading activities.	Y	
					Water samples collected from within the dredge plume (dredge site) and adjacent areas and analysed for trace metals and nutrients.		Y
					Confirmation monitoring of water quality through sample collection and laboratory analysis during 1st and 6th dredge campaign at both the dredging and placement areas under the new 10-year LMDMP. Confirmation monitoring to also occur if new TSHD plant is used.		Y
Dredging and dredge material placement	Marine Flora and Fauna	• Short term, localised impacts to marine megafauna (i.e. whales, dolphins, etc) may be experienced from underwater noise generated by dredge equipment. • Based on historical observations, it is unlikely that marine megafauna will be struck by dredge equipment. • The TSHD Brisbane is fitted with turtle excluding devices. Therefore, there is a low likelihood of turtles becoming entrained in the drag head of dredging vessels. • The new DMPA has been surveyed and is largely devoid of benthic habitat features (i.e. seagrass, reef, or rocky substrates) and exhibits a low fauna diversity. This limits the likelihood of smothering any significant marine habitat or fauna, however, site sampling will be undertaken every five years to confirm this. • Local traditional owners have been consulted in regards to indigenous heritage values of the new placement area and no concerns have been identified.	Low	Marine Flora and Fauna	Monitoring for seagrass annually.	Y	
					Port baseline surveys every three years.		Y
					Benthic fauna and flora sampling and particle size analysis at sites within and adjacent to the new placement site every five years.		Y
Dredging and dredge material placement	Marine Pests	• There is a low risk of dredging vessels introducing marine pests to the Port and broader marine environment. The TSHD Brisbane operates mostly in Queensland waters and undergoes regular inspections for marine pests and hull cleaning. The Willunga remains at the Port year round.		Marine Pests	Survey of the location and status of marine pests within the Port (additional surveys undertaken by Biosecurity Queensland).		Y

7. Consultation Outcomes

Ports North has implemented an ongoing consultation process through established forums over a number of decades, and more recently has engaged in detail with two key groups – the Cairns Port Technical Advisory Committee (TACC) and Cairns Local Marine Advisory Committee (LMAC) - in preparation for the present permit application.

The TACC was established in 1990 to provide local knowledge and a consultative forum for stakeholders in relation to dredging activity at the Port. The group meets annually to review and provide advice on dredging and placement activities. Membership includes representatives from the Queensland Department of Environment and Science (DES), TropWater, the Queensland Department of Agriculture and Fisheries (DAF), Maritime Safety Queensland (MSQ), Cairns Regional Council (CRC), the Commonwealth Department of Agriculture, Water and Environment (DAWE), the Great Barrier Reef Marine Park Authority (GBRMPA), North Queensland Land Council (NQLC), traditional owners, Cairns and Far North Environment Centre (CAFNEC), the Association of Marine Park Tourism Operators (AMPTO), Tourism Tropical North Queensland (TTNQ), the Cairns Ports Advisory Group (PAG), Cairns LMAC, and recreational and commercial fishing groups.

The TACC has input through consultation on environmental management plans, permit amendment applications, any licence exceedances or non-compliances and monitoring results. It has reviewed a draft version of the permit application and LMDMP (2021-2031) and provided feedback. Key areas of interest included:

- Impacts on marine flora and fauna species
- Impacts to water quality and the generation of turbid plumes
- Access restrictions during dredging
- Impacts to Indegenous cultural heritage
- Impacts on fishing values and access
- Cumulative impacts of dredging along Queensland's east coast

Ports North will continue to work with this group through the next 10-year permit period.

Ports North has also been represented on the Cairns LMAC since the early 2000s, where updates and feedback on the maintenance and capital dredging is provided.

The opportunity for public comment on the LMDMP will be provided through this PIP, which follows the terms of reference provided by GBRMPA. Ports North is required to consider and address all comments received and publish a report on the process and outcomes.

8. Potential Impacts to Marine Park Users

During dredging and material placement there may be some temporary impacts to vessel-based operators within the Marine Park, primarily due to navigational disruptions within the channel. This will be managed by the Regional Harbour Master, via Notice to Mariners, and all normal boating laws and rules will apply. When dredging or placement does not occur, park users will have full access to the navigational channel and placement area, as per normal conditions.

Park users may notice some visible plumes around the dredging equipment or at the DMPA, however, this is localised and temporary.

Consultation with the Cairns LMAC and the Port of Cairns TACC over the past 10 years has ensured respective group representatives have remained informed on dredging activities.

Section 4 of the LMDMP outlines the aspects of dredging which have been of interest to Marine Park users over that term and which may be of future consideration.

9. Further Information

A comprehensive suite of information has been used to inform this application process. The following references are provided for additional reading on maintenance dredging at the Port of Cairns.

Table 3 Summary of Past Study Reports and Relevance

Study	How it has informed this application
Long Term Maintenance Dredge Management Plan (LMDMP) 2021-2031, BMT, 2021	Provides supporting information, outlines Ports North's approach to long maintenance dredge planning and details our proposed monitoring and management measures over the next 10 year permit period.
Port of Cairns Long term Dredge Spoil Disposal Management Plan 2010-2020 (LTDSDMP), Worley Parsons, 2009	Documents monitoring and management measures under the current 10 year Marine Park Permit and Sea Dumping Permit. Has been built on as part of the new LMDMP for 2021-2031.
Cairns Harbour Dredging Long Term Dredge Spoil Disposal Management Plan, 2005-201, Environment North, 2005	Details the impact assessment and related monitoring programs during the 2005-2010 Marine Park Permit and Sea Dumping Permit term. The outcomes have informed our understanding of potential impacts from dredging and assisted in determining the monitoring program for the new LMDMP for 2021-2031.
Cairns Shipping Development Project (Draft, 2015 and Revised Draft, 2017, Environmental Impact Study), Ports North	Synthesises a number of studies undertaken between 2011 and 2018. Studies not only considered capital dredging, but also specifically examined ongoing maintenance dredge requirements associated with the newly constructed channel. These studies also provide a contemporary baseline summary of the environmental values within the Cairns-Trinity Bay area and their relevance to both capital and maintenance dredging activity. The outcomes of hydrodynamic modelling have informed the impact assessment and sensitive receptor thresholds presented in the new LMDMP for 2021-2031. The EIS also contains a detailed assessment of dredge material placement options, with outcomes directly relevant to management of ongoing maintenance dredge material.
Sedimentology of Trinity Bay, Final Report on ARC Grant Project Report, Cairns Port Authority – James Cook University, 2002	Provides outcomes of the five-year Australian Research Council grant project between Cairns Port Authority and James Cook University which investigated sedimentary processes in the region. This has informed management of dredging and optimisation of placement locations.
Long Term Cairns Harbour Seagrass Monitoring Program, TropWater-James Cook University, 2020	Annual survey report on the status of seagrass across the whole of Port, including meadows adjacent to maintenance dredging activity. The report summarises the long-term trends of seagrass habitats. It also provides the outcomes of dredge related impact monitoring programs and has informed the proposed monitoring plan for the new LMDMP for 2021-2031.

Table 3 Summary of Past Study Reports and Relevance

Study	How it has informed this application
Maintenance Dredging Strategy for Great Barrier Reef World Heritage Area Ports: Technical Supporting Document, Haskoning Australia Pty Ltd, 2016	Identifies the Port's historical dredging volumes and likely future requirements and limits, considers environmental windows and examines opportunities for the beneficial reuse of dredge material. It also establishes a structure for risk-based monitoring programs, upon which the Queensland Maintenance Dredging Strategy, and the Guidelines for LMDMPs were based, and consequently has informed the structure and content of the Port of Cairns LMDMP for 2021-2031.
Sediment and Dredging at GBR Ports, Reef 2050 Long Term Sustainability Plan - Water Quality Action 17 (WQA17) Final Report, Queensland Ports Association, 2018	Details the sedimentary processes at each of the main ports within the Great Barrier Reef area and includes specific details on volumes of siltation at each port. This has informed the understanding of coastal processes at the Port of Cairns and assisted in determining the future dredging needs for 2021-2031.
2010-2020 International Maritime Organisation (IMO) Report Forms, Ports North, 2021	Confirms the volume of maintenance material dredged and placed under the Sea Dumping Permit over the past permit term as reported to the Commonwealth to meet reporting obligations under the London Convention for management of sea dumping.
Sediment Analysis Plan Report, Advisian Pty Ltd, 2020	Provides an example of the detailed approach Ports North adopts to assess sediment quality and implement outcomes of a Sediment Analysis Plan. These types of studies have been used to inform our understanding of the long-term trends in sediment quality at the Port.
Environmental Management Plan (EMP) for dredge "*Willunga*", Ports North 2021	Outlines the environmental management measures applied to the operation of Ports North's clamshell dredge "*Willunga*".
Environmental Management Plan (EMP) for dredge "TSHD *Brisbane*", Port of Brisbane Pty Ltd, 2021	Outlines the environmental management measures applied to the operation of the TSHD Brisbane which is regularly contracted to complete the main channel maintenance campaign.

10 Legislation Concordance Table

The Terms of Reference for the Public Information Package requires Ports North to identify documents (or part thereof) that demonstrate that each Sub-Section of Section 103 of the *Great Barrier Reef Marine Park Regulations 2019 (Cth)* and sections 10 and 11 of the *Marine Parks Regulation 2017 (Qld)* have been met.

Table 4 below provides a summary of how these Acts have been met.

Table 4 Legislative Concurrence

Legislative Requirements	Ports North Response
Great Barrier Reef Marine Park Regulations 2019 (Section 103)	
(a) if the proposed conduct will take place in a zone - the objectives (if any) of the zoning plan for the zone;	Maintenance dredge material is proposed to be placed in the General Use Zone of the GBRMP. The objective of the General Use Zone is to provide opportunities for reasonable use of the Great Barrier Reef Marine Park, while still allowing for the conservation of these areas. The placement of material is aligned with the zone objectives.
(b) if the proposed conduct will take place in a specific area of the Marine Park to which a legislative instrument under the Act (whether this instrument or another instrument), or a provision of such a legislative instrument, applies - that instrument or provision;	The activity will take place at the location shown in Figures 1 and 4.
(c) Whether the applicant for the permission is a suitable person to hold a permission for the proposed conduct, having regard to: (i) the applicant's capacity to engage in and manage the proposed conduct to the satisfaction of the Authority; and (ii) the applicant's history in relation to environmental matters; and (iii) if the applicant is a body corporate - the history of its executive officers in relation to environmental matters; and (iv) if the applicant is a subsidiary of a holding company - the history of the holding company and its executive officers in relation to environmental matters; and (v) whether the applicant owes any fee or other amount payable under the Act, this instrument or any other instrument made for the purposes of the Act; and (vi) any other relevant matter;	Ports North has previously held a 10-year permit that has been approved by the Authority. The conditions of that permit have been met and no serious environmental incidents recorded. Ports North and its predecessors have held a number of Marine Park approvals for both dredging and facility operation and maintenance and have demonstrated a sound compliance record.
(d) the requirement in section 37AA of the Act for users of the Marine Park to take all reasonable steps to prevent or minimise harm to the environment in the Marine Park that might or will be caused by the user's use or entry;	Section 6 of this PIP (and the LMDMP) describes how potential impacts to the Marine Park will be minimised.
(e) whether there are feasible and prudent alternatives to the proposed conduct;	As described in the Frequently Asked Questions, a number of alternatives to dredging and placement within the GBRMP were explored. This process is further outlined in the LMDMP.

Legislative Requirements	Ports North Response
(f) any written comments received under Division 4 in connection with the application;	Informal comments on the draft LMDMP have been provided by a number of participants of the TACC. These comments have been incorporated in the final LMDMP.
(g) the relevant impacts of the proposed conduct;	Potential impacts of maintenance dredging and the placement of material are described in Section 6. All potential impacts have been identified as low risk.
(h) options for avoiding, mitigating and offsetting those relevant impacts;	Options for avoiding and mitigating any low risk impacts identified are detailed in the LMDMP and captured in Ports North's Environmental Management System.
(i) options for monitoring and managing those relevant impacts;	Monitoring over the lifetime of the 10-year permit is described in Section 8.
(j) a law of the Commonwealth or of Queensland as in force from time to time, or a relevant plan (as in force from time to time) made under such a law, that: (i) relates to the management of the environment or to an area in the Marine Park; and (ii) is relevant to the proposed conduct; except so far as that law or plan is covered by paragraph (b);	Works will be undertaken in accordance with any Commonwealth or Queensland legislation in place.
(k) if the proposed conduct also requires an approval under the *Environment Protection and Biodiversity Conservation Act 1999*: (i) whether the approval has been, or is likely to be, granted and, if granted, the terms and conditions of it being granted; and (ii) any relevant assessment documentation (within the meaning given by subsection 133(8) of that Act) in relation to the approval;	Works are unlikely to have an impact on a Matter of National Environmental Significance, therefore no approval under the Act is required.
(l) if the proposed conduct also requires an approval or a permission (however described) under a law of Queensland - whether the approval or permission has been, or is likely to be, granted and, if granted, the terms and conditions of it being granted;	A number of Federal and State approvals necessary for conduct of maintenance dredging (extraction and removal from tidal waters) or disposal (extraction and placement on land or other areas under tidal waters) apply at the Port of Cairns. The identified approvals triggers are: • Marine Park Permit - Maintenance dredging and disposal in Federal and State Marine Park • Sea Dumping Permit - Maintenance dredging and disposal at sea • Environmental Authority - Undertake maintenance dredging of navigational infrastructure • Development Permit for Operational Works (Tidal Works) – Maintenance of an approved work and the disposal of dredged material below high-water mark • Development Permit for Operational Works (Marine Plant Disturbance) – removal or disturbance of marine plants. Ports North currently holds valid copies of each of these permits, however, this document supports renewal applications for the GBR Marine Park Permit and the Sea Dumping Permit.

Legislative Requirements	Ports North Response
(m) any recovery plan, wildlife conservation plan, threat abatement plan or approved conservation advice, that is relevant to the proposed conduct;	N/A
(n) any international agreement to which Australia is a party, or any agreement between the Commonwealth and a State or Territory, that is relevant to the proposed conduct;	N/A
(o) any policies that are relevant to the proposed conduct and the management of the Marine Park or of its environment, biodiversity or heritage values and are: (i) published by the Authority under paragraph 7(4)(a) of the Act; or (ii) adopted by the Department administered by the Minister administering the E*nvironment Protection and Biodiversity Conservation Act 1999*;	N/A
(p) any other matters relevant to the proposed conduct and either: (i) achieving the objects of the Act; or (ii) orderly and proper management of the Marine Park;	While there may be some temporary exclusions of vessel traffic during the placement of material, there will be no permanent displacement or interference with use of the Marine Park by its users.
Marine Parks Regulation Sections (10 & 11)	
In considering an application for a permission for a marine park or a part of a marine park, the chief executive must have regard to all of the following -	
(a) the potential impact of the conduct proposed to be permitted under the permission (the proposed conduct) on the environment and on the cultural resources of the marine park or part;	Potential impacts to the Marine Park are discussed in Section 6.
(b) options for monitoring, managing and mitigating the potential impact of the proposed conduct on the environment and on the cultural resources of the marine park or part;	Options for avoiding and mitigating any low risk impacts identified are detailed in the LMDMP and captured in Ports North's Environmental Management System.
(c) any other matters relevant to the orderly and proper management of the marine park;	N/A
(d) if the proposed conduct will take place in an area to which a zoning plan applies - the objects of the area as set out in the zoning plan;	Maintenance dredge material is proposed to be placed in the General Use Zone of the GBRMP. The objective of the General Use Zone is to provide opportunities for reasonable use of the Great Barrier Reef Marine Park, while still allowing for the conservation of these areas. The placement of material is aligned with the zone objectives.
(e) any written submissions received about the application in response to any public notice of the application given under Section 15;	Informal comments on the draft LMDMP have been provided by a number of participants of the TACC. These comments have been incorporated in the final LMDMP.

10. Legislation Concordance Table

Legislative Requirements	Ports North Response
In considering an application for a permission for a marine park or a part of a marine park, the chief executive may also have regard to the following -	
(a) the effect that the grant of the permission will have on public appreciation, understanding, and enjoyment of the marine park;	While there may be some temporary exclusions of vessel traffic during the placement of material, there will be no permanent displacement or interference with use of the Marine Park by its users.
(b) the potential impact of the conduct proposed to be permitted under the permission (the proposed conduct) on other conduct in the relevant area or nearby areas, or in the marine park, that is being undertaken, is planned, is in progress, or is reasonably foreseeable at the time of the chief executive's consideration of the application, whether or not relevant;	Potential impacts to marine park values are addressed in Section 6 of this document and the LMDMP.
(c) any policy or guideline issued by the chief executive about the management of the marine park or the performance of the chief executive's functions under the Act;	N/A
(d) if the application for the permission relates to an undeveloped project the cost of which will be large - the capacity of the applicant to satisfactorily develop and manage the project;	Ports North has legislative responsibility for maintenance of navigability of Cairns Port. Ports North has been successfully undertaking and managing maintenance dredging for many years.
(e) if the proposed conduct also requires an approval or a permission under a law of the State or a law of the Commonwealth or another State - (i) whether the approval or permission has been granted and, if so, its terms; or (ii) whether the approval or permission is likely to be granted and, if granted, its likely terms;	A number of Federal and State approvals necessary for maintenance dredging (extraction and removal from tidal waters) or disposal (extraction and placement on land or other areas under tidal waters) apply at the Port of Cairns. The identified approval triggers are: • Marine Park Permit - Maintenance dredging and disposal in Federal and State Marine Park • Sea Dumping Permit - Maintenance dredging and disposal at sea • Environmental Authority - Undertake maintenance dredging of navigational infrastructure • Development Permit for Operational Works (Tidal Works) – Maintenance of an approved work and the disposal of dredged material below high-water mark • Development Permit for Operational Works (Marine Plant Disturbance) – removal or disturbance of marine plants. Ports North currently holds valid copies of each of these permits, however this document supports renewal applications for the GBR Marine Park Permit and the Sea Dumping Permit.
(f) any relevant intergovernmental, Australian or international agreement, code, instrument, protocol or standard;	N/A
(g) any relevant law of the State or of the Commonwealth, or a relevant instrument;	Works will be undertaken in accordance with relevant State or Commonwealth legislation.

Legislative Requirements	Ports North Response
(h) any relevant recovery plan, wildlife conservation plan, threat abatement plan or approved conservation advice under the *Environment Protection and Biodiversity Conservation Act 1999 (Cwlth)*, or any conservation plan under the *Nature Conservation Act 1992*;	N/A
(i) whether the applicant for the permission is a suitable person to hold the permission, having regard to - (i) the applicant's history in relation to environment matters; and (ii) if the applicant is a body corporate - the history of its executive officers in relation to environment matters; and (iii) if the applicant is a company that is a subsidiary of another company (the parent body) - the history of the parent body and its executive officers in relation to environment matters; and (iv) whether the applicant owes any amount payable under the Act;	Ports North and its predecessors have held a number of environmental approvals, including those applicable to activities within the Marine Park, and have demonstrated a sound compliance record. There are no current outstanding actions, proceedings, or fees under the relevant Act.
(j) the likely cumulative effect of the applicant's proposed use and other uses on a marine park;	There are no other known proposals over the proposed placement area. Works are not expected to interfere with other Marine Park users or uses.
(k) any other matters relevant to achieving the purpose of the Act.	Nil

Frequently Asked Questions

Q: Why is maintenance dredging needed?

The inshore environment at the Port of Cairns is naturally turbid with large volumes of marine sediment being resuspended in the water column on a daily basis by winds and tides that drive waves and currents. In addition, large storm events, especially cyclones, move significant amounts of sediment and the river runoff from flood rain brings further sediment into the system.

Over time these sediments accumulate in navigational infrastructure at ports such as berths, swing basins and shipping channels. Like road and rail networks, these need to be maintained to ensure the safe and efficient movement of ships in and out of ports.

Maintenance dredging is needed to ensure safe channel depths and the Regional Harbour Master is responsible for determining this.

Q: What does maintenance dredging involve?

Dredging activities are typically undertaken using specialised dredging equipment which removes the built-up sediment and relocates it to a selected placement area. The majority of dredging activities will involve the use of a Trailer Suction Hopper Dredge (TSHD) which includes a number of features aimed at reducing environmental impacts, including under keel discharge, green valve technology, and turtle deflectors.

Q: Why are you applying for a maintenance dredging permit?

Ports North has a long history of successfully delivering annual maintenance dredging campaigns at the Port of Cairns. In recognition of this, the Port of Cairns was the first port in Australia to obtain a 10-year permit for maintenance dredging activities in 2010. This permit will expire in mid-2022 and we are now seeking a new 10-year permit.

Q: What are the timeframes regarding the approvals process?

Before any work can commence, Ports North must gain approval from the Great Barrier Marine Park Authority (GBRMPA) to carry out maintenance dredging and place material within the Marine Park. It is expected that maintenance dredging undertaken from 2022 onwards will be under the new permit and in accordance with the approved LMDMP.

Q. How much dredging are you proposing to undertake at the Port of Cairns?

Ports North is proposing to dredge and relocate up to 5,200,000 in-situ cubic metres over the 10 years. Dredging is carried out annually, with a proposed maximum annual volume of 730,000 in-situ cubic metres. Some additional emergency dredging may be required after cyclonic events, which typically deliver a greater volume of sediment to the region.

Q. How long will each dredge campaign take?

Each entrance channel campaign is likely to last between 3-6 weeks during winter months (outside of the wet season). Some minor dredging within the inner harbour berth pockets, marina, Navy Base, and commercial fishing bases is undertaken year round depending on need.

Q. What is the nature of material being dredged?

The maintenance dredge material is typically clay with a very high content of fine-grained material. Annual testing of the material has not identified any contaminants harmful to the marine environment.

Q. What happens if you don't dredge?

If the channel cannot be maintained to allow safe navigation, cruise ships and other larger vessels would likely choose other port destinations, and over time the channel would silt up to an un-economical depth. This would have a profound impact on residents in Cairns and Far North Queensland, particularly with respect to fuel supply. Further, it would place significant constraints on the ability to deliver goods and services to remote communities in Torres Strait, Cape York and the Gulf of Carpentaria.

It would also have a major impact on the region's economic well-being. The overall direct economic impact for the Port of Cairns for 'Port Related Industries' for 2013–14 was estimated to be $838 million and 3776 jobs respectively.

Q. Are there alternatives to dredging?

Alternatives dredging are very limited. Some overseas ports use underwater barriers to deflect or prevent sedimentation in the channels. However, the length and scale of the Cairns shipping channel makes such an alternative unfeasible. These structures would also cause significant impacts on local hydrodynamics and marine habitats of significance such as seagrass. The increasing use of complementary bed levelling for the inner Port and marina areas has reduced some maintenance dredging. Consideration of options to minimise the need for dredging is ongoing, however, the ability to influence the accumulation of sediments within the port channels and berths is limited.

Q. Were alternatives to placing material at sea explored?

Yes, as part of the permit assessment process a full range of alternatives were considered including using the material for land reclamation, mine rehabilitation, beach nourishment, construction fill or land disposal in a confined site. These options were not viable because;

- the maintenance dredge material has a high percentage of fine sediments, which make it unsuitable for fill material on land or intertidal areas
- there are no available practical land-based sites for placement
- should material be bought to land it would need significant treatment i.e. acid sulfate soil treatment, amelioration of poor quality and dewatering (likely for a number of years)
- planning, regulatory and environmental management zonings of seabed areas adjacent to Cairns rule out aquatic beneficial reuse options

Q. Where will the dredge material be relocated to?

The material will be relocated to a newly identified placement area which is located immediately adjacent to the existing DMPA. This area was chosen because it does not contain any significant environmental receptors and is in close proximity to the existing site which has been the subject of multiple successful dredge campaigns over several decades. Modelling of potential impacts has confirmed that the use of this site presents a low environmental risk.

Q What environmental impacts has your study identified?

Ports North maintains a risk assessment framework that is regularly reviewed and updated to reflect environmental monitoring and observations following each major dredge campaign. All potential environmental risks are considered low.

Q: How can we be confident that the works will be undertaken responsibly?

The approval issued to Ports North will have a number of conditions that must be complied with including monitoring and regular reviews of maintenance dredging. This will be independently audited. Ports North will also report on its compliance with the permit to GBRMPA and the TACC and make any monitoring data publicly available. Further, Ports North have already demonstrated through the current 10 year permit and previous 5 year permits that dredging works are undertaken responsibly.

Q: Will there be any operational impact on other users of the Port and the Great Barrier Reef Marine Park?

Operational impacts for Park users will be minor and temporary and involves exclusion from areas where the dredge vessel is operating. All users will be notified of any changes and all boating laws and rules will apply.

Ports North

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