



SECTION 26
Outstanding Universal Value



26.0 Outstanding Universal Value

26.1 Introduction

This section provides information to address submissions received in response to the Port Expansion Project (PEP) Environmental Impact Statement (EIS) relevant to assessment of impacts from the Project on the Outstanding Universal Value (OUV) of the Great Barrier Reef World Heritage Area (GBRWHA).

Of the total submissions, 101 sought more information on the relative role of projected impacts from the PEP in light of other stressors acting on Cleveland Bay and the broader Great Barrier Reef (GBR) environment. These have been addressed in Section 25.0 (Cumulative Impact Assessment) of the AEIS. Five submissions sought information on how the Project may impact OUV of the GBRWHA, these matters are addressed below.

26.2 Response to Submissions

26.2.1 Impact from the Project on the Outstanding Universal Value (OUV) of the Great Barrier Reef World Heritage Area

10 submissions were received regarding the scale of the Project, the threats to the GBR region from other known stressors (including other port projects) and the degraded condition and low resilience of local marine habitats (e.g. around Magnetic Island and in Cleveland Bay). These submitters were of the view that the Project would adversely impact the OUV of the GBRWHA and on that basis the Project should not proceed.

More specific comments from submissions about OUV included:

- the incompatibility of dredging and material placement within the boundaries of the GBRWHA
- that the EIS had failed to identify/define the ecological significance of Cleveland Bay in the context of the larger GBRWHA.

The AEIS has re-assessed potential impacts from the Project to OUV based on the new Guidelines (EPBC Act referral guidelines) produced by the Australian Government, Department of Environment (2014) and based on the findings of the revised environmental impact assessment.

Given their strong links to OUV, this section also discusses the consistency of the revised design with new documentation that has been released since the EIS including the Great Barrier Reef Region Strategic Assessment (2014) and the Reef 2050 Long-Term Sustainability Plan (2015). These are described in Section 26.3 below.

26.3 Revised Environmental Impact Assessment

26.3.1 Legislation and policy

Great Barrier Reef Strategic Assessment

In response to the United Nations Educational, Scientific and Cultural Organization (UNESCO) mission, a comprehensive Strategic Assessment of the GBRWHA and adjacent coastal zone was undertaken by the Australian and Queensland Governments between 2012 and 2014. The assessments were carried out under Part 10 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and form part of the Australian Government's response to the World Heritage Committee's concerns about development impacts on the WHA (The State of Queensland, 2013; Great Barrier Reef Marine Park Authority, 2014).

Overall, the assessment found that:

... the OUV of the GBRWHA remains largely intact and the Reef remains one of the most resilient tropical marine ecosystems in the world. However the accumulation of impacts through time and over an ever increasing area is diminishing the Reef's health (from Preface - pg. 2).

Recommended changes to management of ports and dredging in the Strategic Assessment that are relevant to the Additional Information to the Environmental Impact Statement (AEIS) include the following.

- Improving certainty regarding the location of ports, and reducing further fragmentation of coastal ecosystems through a Queensland Ports strategy that concentrates port development to around long-established major ports in Queensland.
- Supporting a strategic approach to the planning, assessment and management of port development, including long-term integrated planning for the network of trading ports on the GBR coast, with a view to achieving environmental, social and economic sustainability at a reef-wide scale.
- Contributing to the development of improved governance arrangements across GBR ports aimed at strengthening coordination between responsible agencies across all jurisdictions, focusing on efficient and sustainable development of ports and associated activities.

- Improving understanding and management of environmental impacts from dredging and dredged material disposal in the GBRWHA, recognising the current uncertainty surrounding the duration, intensity and extent of predicted dredge material plumes, and their impacts on the Region's values. In particular by:
 - exploring with proponents and government agencies all alternatives which may avoid and reduce the need for dredging and dredge material disposal, and provide better environmental outcomes
 - ensuring dredging and dredge material disposal decisions take account of the GBR hydrodynamic and water quality guidelines, and do not exceed ecosystem thresholds
 - working with port corporations, other agencies and proponents to identify and address critical information needs, and to promote research and development into innovative best practice arrangements to mitigate cumulative impacts of port activities within the region.

Reef 2050 Plan

In its 2014 decision, the World Heritage Committee requested that a long term plan be prepared that, 'results in concrete and consistent management measures that are sufficiently robust, effectively governed and adequately financed to ensure the overall long term conservation of the property and its OUV, including in view of addressing cumulative impacts and increasing reef resilience' (World Heritage Committee, 2014).

In response to the threats posed to the GBRWHA, the Australian Government and Queensland State Government drafted the *Reef 2050 Long-Term Sustainability Plan (2050 Plan)* (Australian Government and Queensland Government, 2015). The Plan outlines measures for identifying, protecting, conserving, presenting and transmitting of the Reef's OUV for future generations.

Actions with the 2050 Plan that are relevant to ports and dredging (and therefore the AEIS) include the following:

- Objective WQO2 which states that, 'Over successive decades the quality of water in or entering the Reef from all sources including industrial, aquaculture, port (including dredging), urban waste and stormwater sources has no detrimental impact on the health and resilience of the Great Barrier Reef'
- Actions WQA 14 – 22 outline relevant to reducing the impact of ports and dredging on water quality.

OUV Guidelines

Since the EIS was released there has been substantial further guidance provided about the OUV of the GBR including finalisation of EPBC Act referral guidelines published by the Australian Government Department of the Environment (DoE, 2014). These guidelines have been used in the reassessment of the Project in this updated section.

The Guidelines outline that OUV is the key reference point for the protection and management of world heritage properties and is the central idea of the World Heritage Convention. Broadly, the meaning of OUV is as follows.

- Outstanding: For properties to be of outstanding universal value they should be exceptional, or superlative — they should be the most remarkable places on earth.
- Universal: Properties need to be outstanding from a global perspective. World Heritage listing does not aim to recognise properties that are remarkable from solely a national or regional perspective.
- Value: What makes a property outstanding and universal is its "value", or the natural and/or cultural worth of a property. This value is determined based on standards and processes in the Operational Guidelines for the Implementation of the World Heritage Convention (the Operational Guidelines) (Intergovernmental Committee for the Protection of the World Cultural and Natural Heritage, 2013).

The Attributes that contribute to the OUV of the GBRWHA are identified in the *Statement of Outstanding Universal Value* which was prepared retrospectively to capture the values of the property at the time of listing in 1981. While a starting point for assessment, it is noted in the OUV Guidelines that the Attributes identified in the Statement for the GBRWHA are examples only and do not represent the full suite of attributes contributing to the OUV of the property, nor are they geographically specific.

Under the Statement of OUV, the following Criteria from the Convention underpin the listing of the GBRWHA site.

- Criterion vii - Contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance.
- Criterion viii - Be outstanding examples representing major stages of earth's history, including the record of life, significant on-going geological processes in the development of landforms, or significant geomorphic or physiographic features.
- Criterion ix - Be outstanding examples representing significant ongoing ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals.

- Criterion x - Contain the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation.

Table 26.1 lists the four criteria under which the site has been listed and highlights with italicised blue text those values/features that are considered particularly noteworthy at a local (Cleveland Bay) scale and therefore represent a local articulation of relevant OUV.

UNESCO undertook a reactive monitoring mission in 2012 at the request of the World Heritage Committee at its 35th session in Paris. The mission assessed the state of conservation of the GBRWHA and the resulting report (Douvere, 2012) concluded that while the overall OUV has likely been maintained, the environmental quality of parts of the Great Barrier Reef ecosystem have declined since the time of inscription in 1981. This is particularly relevant for inshore areas of the reef south of Cooktown.

Table 26.1 Attributes underpinning World Heritage Listing of the GBRWHA (items in italicised blue text indicates local values that are present and noteworthy in the local [Cleveland Bay] context)

Relevant Criteria			
Criterion vii	Criterion viii	Criterion ix	Criterion x
<ul style="list-style-type: none"> ▪ <i>superlative natural beauty above and below the water</i> ▪ <i>string of reef structures</i> ▪ <i>mosaic patterns of reefs, islands and coral cays produce an unparalleled aerial panorama of seascapes</i> ▪ <i>green vegetated islands</i> ▪ <i>spectacular sandy beaches</i> ▪ <i>azure waters</i> ▪ <i>vast mangrove forests</i> ▪ <i>vegetated mountains</i> ▪ <i>lush rainforest gullies</i> ▪ <i>breeding colonies of seabirds and marine turtles</i> ▪ <i>green turtle breeding</i> ▪ <i>over-wintering butterflies</i> ▪ <i>coral assemblages of hard and soft corals</i> ▪ <i>thousands of species of reef fish</i> ▪ <i>coral spawning</i> ▪ <i>migrating whales</i> ▪ <i>nesting turtles</i> ▪ <i>significant spawning aggregations of many fish species</i> 	<ul style="list-style-type: none"> ▪ continental shelf ▪ flat-topped hills of eroded limestone ▪ continental islands ▪ coral cays ▪ new phases of coral growth ▪ old massive corals ▪ <i>coral reef ecosystem</i> ▪ <i>inshore fringing reefs, mid-shelf reefs, and exposed outer reefs, including examples of all stages of reef development</i> ▪ <i>processes of geological and geomorphologic evolution</i> ▪ <i>unique and varied seascapes and landscapes</i> ▪ continental slope ▪ deep oceanic waters ▪ abyssal plains 	<ul style="list-style-type: none"> ▪ <i>significant diversity of reef and island morphologies reflects ongoing geomorphic, oceanographic and environmental processes</i> ▪ cross-shelf, longshore and vertical connectivity ▪ coral reefs, sand banks and coral cays ▪ beds of <i>Halimeda</i> algae ▪ evolution of hard corals ▪ other fauna, including microfauna ▪ <i>over 4000 species of molluscs, over 1500 species of fish, plus a great diversity of sponges, anemones, marine worms, crustaceans, and many others</i> ▪ <i>vegetation on the cays and continental islands</i> ▪ important role of birds, such as the Pied Imperial Pigeon, in processes such as seed dispersal and plant colonisation ▪ numerous shell deposits (middens) ▪ fish traps ▪ story places ▪ marine totems 	<ul style="list-style-type: none"> ▪ <i>diversity supports marine and terrestrial species (global conservation significance)</i> ▪ <i>coral reefs (400 species of corals in 60 genera)</i> ▪ <i>diversity of mangroves</i> ▪ <i>diversity of seagrass</i> ▪ <i>dugong</i> ▪ <i>species of whales</i> ▪ <i>species of dolphins</i> ▪ <i>humpback whale calving</i> ▪ <i>marine turtle</i> ▪ <i>green turtle breeding</i> ▪ <i>marine turtle rookeries</i> ▪ <i>242 species of birds</i> ▪ <i>22 seabird species breeding (cays and some continental islands, globally significant breeding sites)</i> ▪ <i>plant species diversity and endemism</i> ▪ <i>coral cays</i>

26.3.2 Design refinement

Capital and more regular annual maintenance dredging of navigation channels and associated dredge material placement remain unavoidable consequences of having an operating Port in Townsville as it responds to global shipping trends (with larger ships seeking to come to port) and increasing domestic import and export markets. These uses significantly pre-date declaration of the World Heritage Area and were operating at the time of listing the World Heritage site in 1981. While the boundaries of the GBR Marine Park exclude the operating port area, channel and approved dredge material placement area (DMPA), all of these areas are within the GBRWHA which covers all coastal waters to Lowest Astronomical Tide.

In responding to submissions and emerging Government policy for beneficial reuse of dredge material on land or in reclamation, potential impacts to the OUV of the GBRWHA from the revised proposal have been reduced. As identified previously, this has been achieved principally through the placement of all dredged material into the reclamation area compared to the original PEP proposal where all of this material was proposed to be placed offshore.

While reducing the quantum of material that will be placed at sea, this placement strategy in the reclamation increases the footprint of the reclamation, resulting in the permanent loss of World Heritage Area expanding from 100 ha in the EIS to approximately 150 ha under the revised proposal.

As was the case in the EIS, it continues that a range of direct and indirect environmental offsets are proposed for this loss as outlined in Section 27.0 (Offsets) of the AEIS.

26.3.3 Supporting studies

In the context of re-assessing the potential impacts of the Project on OUV, reference has been made to the procedures and approach set out in the 2014 Referral Guidelines. Commentary is also provided in the revised assessment about the consistency of the proposal with the Strategic Assessment and 2050 Plan.

26.3.4 Revised assessment

26.3.4.1 Impact assessment

In addition to meeting each of the relevant criterion as stated above for OUV for the GBR, a natural world heritage property must also meet the conditions of Integrity. The World Heritage Convention Operational Guidelines state that “*integrity is a measure of the wholeness and intactness of the natural (and or cultural heritage) and its attributes*” and further that to examine the condition of integrity requires assessment of the extent to which the property:

- a) *Includes all elements necessary to express its Outstanding Universal Value*
- b) *Is of adequate size to ensure the complete representation of the features and processes that convey the property's significance*
- c) *Suffers from adverse effects of development and or neglect” (DOE 2014).*

The EPBC Act guidelines for OUV (OUV Guidelines) provides guidance on how to determine both the significance of likely impacts (direct, indirect and cumulative) using a series of questions about potential impacts on the listed key attributes of OUV and on the Integrity of the GBRWHA based on the Operational Guidelines.

This section uses this ‘interrogation framework’ to determine impacts to OUV by drawing from the cumulative impacts assessment results (Section 25.0 of the AEIS), along with the results from the separate discipline-specific amended assessment contained in the relevant sections. These impacts are summarised in Table 26.2 and Table 26.3 below. Table 26.2 seeks to address the requirements of the OUV Guidelines as they relate to ‘Attributes’ based on the questions posed in the Guidelines about determining a significant impact. Table 26.3 outlines how the ‘Integrity’ of OUV have been met by the Project.

This section is also consistent with the Strategic Assessment and 2050 Reef Plan.

Table 26.2 Assessment of Impacts to WHA 'Attributes'

World Heritage Criterion	Questions Posed by the EPBC Act Guidelines for Impacts on Attributes	Response
Criterion vii	Will the proposed action of itself, or in combination with other relevant impacts, result in loss or degradation of areas that are essential for maintaining the beauty of the property?	<p>The Port has operated for a period of 150 years at its current location which has included annual maintenance dredging and industrial activities. The key sensitive ecological receptors are routinely exposed and impacted by other processes such as cyclones, bleaching and nutrients and sediments entering from catchment sources. The PEP Project will lead to short term localised changes in turbidity from dredge plumes (particularly in calm weather or following 'drier' wet seasons when background turbidity is lower) during the capital dredging campaign. Risks will be managed by not undertaking capital dredging by TSHD following extreme wet seasons, or following major cyclones or bleaching events, and through the risk management controls identified in the AEIS. Sedimentation rates and predicted mobilisation of displaced sediment during the capital dredging is not expected to result in detectable or observable changes to coastal processes including accumulation of mud or silts on Magnetic Island beaches.</p> <p>Overall, the marginal changes predicted from the Project are local in nature and not likely to significantly detract from the present natural beauty of the property, or the biota that maintain these values within Cleveland Bay and the greater GBR.</p>
Criterion viii	Will the proposed action of itself, or in combination with other relevant impacts, impact on the key interrelated and interdependent elements in their natural relationships?	<p>Unlike the middle and outer reef systems of the GBR, the inner shelf region, including Cleveland Bay is a long-standing medium to high turbidity environment and the key ecological processes are adapted to these environmental conditions.</p> <p>While some temporary impacts are predicted, long term changes to key physical processes (hydrodynamics, sediment transport processes, shoreline processes, waves, currents), key chemical processes (long term water quality, sediment quality) and key biological processes (breeding, recruitment, fish movement and patterns, nesting and reproductive behaviour) that control ecosystem elements are not expected.</p>
Criterion ix	Will the proposed action of itself, or in combination with other relevant impacts, result in the loss of necessary elements that are essential for the long term conservation of the area's ecosystems and biodiversity?	<p><u>Direct Impacts from the Proposal – Benthic Habitat Loss or Damage</u></p> <p>Benthic habitat within the area of permanent impact (reclamation) do not contain corals, seagrass, endangered, or significant inter-tidal or sub-tidal habitats, that are not well represented elsewhere in the study area (which has an abundance of soft bottom benthic habitat) and are not known critical life cycle habitat areas for key marine megafauna species (e.g. breeding sites, nesting sites, critical feeding habitat).</p> <p>Fauna that are known to use these areas for foraging such as inshore dolphins will have reduced habitat range from which to forage but have abundant similar habitat elsewhere in Cleveland Bay and in adjoining embayments (Halifax, Bowling Green) that could be utilised. The key findings of surveys outlined in the EIS are indicative that key species such as Snubfin dolphin are regularly observed in Cleveland Bay around the existing Port.</p> <p>Benthic habitats that will be subject to temporary impacts (such as dredged areas of the outer harbour and the channel widening and deepening) will start recovering almost immediately following disturbance but with full recolonization and recovery likely over medium time frames (12 – 24 months). While the resultant habitats will be modified (deeper), it has been documented and demonstrated in studies as part of the EIS that these habitats will fully recolonise over time and will continue to provide benthic primary production value following disturbance. As a result, significant impacts to Cleveland Bay's ecosystems and biodiversity are not expected.</p> <p>Note that as a result of the revised design in the AEIS, which no longer includes marine placement of capital dredge material at the DMPA, the area of temporary benthic habitat loss from capital dredging will be reduced by 1,140 ha (area of DMPA) compared to the EIS.</p>

World Heritage Criterion	Questions Posed by the EPBC Act Guidelines for Impacts on Attributes	Response
		<p><u>Indirect Impacts from the Project – Water Quality</u> It is recognised that the Project will cause short term, localised changes to the amount of sediments in the water column at fine spatial scales (i.e. at the scale of the plume) from the dredging and from tailwater release from the placed material in reclamation.</p> <p>Additional assessment work has been done in the AEIS to examine the extent to which these sediments are available for re-suspension over periods of up to 12 months, looking at the cumulative volume of sediment available for re-suspension by natural processes from the TSHD dredging process (e.g. overflow of fine material).</p> <p>These re-suspension processes have been specifically modelled and are presented in Section 6.0 (Marine Water Quality) of the AEIS. The modelling assessment has found such changes to be small in magnitude, especially compared to background variability within the affected areas. As a result, significant impacts to Cleveland Bay's ecosystems and biodiversity are not expected; but will be monitored as part of both reactive and long term ecosystem monitoring outlined by the Project.</p> <p><u>Cumulative Impacts from Other Stressors</u> External stressors such as cyclones, nutrient and sediment releases from catchments, high temperature (leading to coral bleaching), acidification, and other anthropogenic activities all play a role in the ecosystem health of marine ecological communities within Cleveland Bay and the broader study area.</p> <p>The cumulative impacts assessment identified that the impacts from proposed Project are likely to be small by comparison to comparable impacts from other impacting stressors. However, the timing of TSHD capital dredging needs to be cognisant of events such as floods, cyclones or bleaching events that may have occurred during the previous wet season.</p> <p>Based on the scale and duration of the direct and indirect impacts of the Project, the necessary elements that are essential for the long term conservation of the area's ecosystem and biodiversity can be maintained.</p>
Criterion x	Will the proposed action of itself, or in combination with other relevant impacts, result in the loss or degradation of habitats required for maintaining the diverse fauna and flora of the region?	<p>As outlined above, the Project will directly affect:</p> <ol style="list-style-type: none"> 1. Seabed habitat within the reclamation footprint (which would be permanently removed). 2. Seabed habitat within the proposed berths of the outer harbour and designated navigation channel . <p>The reclamation footprint, outer harbour and navigation channel, and immediate surrounds are soft sediment habitats that are:</p> <ol style="list-style-type: none"> (i) well represented in the surrounding area, (ii) have generally low levels of biodiversity, and (iii) are not known to support distinct/unusual or otherwise critical ecosystem functions <p>Based on these three factors, flow-on effects to flora and fauna at broader regional spatial scales are therefore not expected. The potential indirect impacts from changes to sediment patterns are addressed above in Criterion (ix). .</p> <p>On the basis of the above, the proposed action is unlikely to cause loss or degradation of habitats required to maintain flora and fauna of the wider GBR region.</p> <p>As an added safeguard to meeting this conservation objective, an environmental offset is proposed to address the remaining residual impacts of the Project by seeking to afford greater protection (through expansion of a Fish Habitat Area under the Queensland <i>Fisheries Act 1994</i>) to similar habitat in the local region at a ratio of 8:1 (compared to the area of habitat lost through reclamation).</p>

Table 26.3 Assessment of Impacts to WHA 'Integrity'

Criterion	Questions Posed by the EPBC Guidelines for Impacts on Integrity	Response
Wholeness	Will the proposed action of itself, or in combination with other relevant impacts, result in the loss of any elements necessary for the property to express its outstanding universal value?	The Project is not expected to result in a loss of any OUV element either individually or in combination with other projects (refer Section 25.0 of the AEIS).
	Will the proposed action of itself, or in combination with other relevant impacts, reduce the size of the property? Will the property be of adequate size to ensure the complete representation of the features and processes which convey its significance?	<p>The Project will reduce the size of the WHA property through the reclamation by an area of 152 ha. This represents 0.0004% of the overall property. Given the overall size of the property relative to the disturbance by the Project, the fact that the Project is proposed in an existing port area and the absence of key OUV in the footprint, there will be no appreciable impact on the representation of features and processes which convey the significance of the property.</p> <p>The size and layout of the reclamation has been optimised to provide for the placement of dredge material (and eliminate the need for marine placement) whilst meeting the Port's operational requirements for long term operation.</p> <p>As outlined in the discussion of 'Attributes', the habitat area lost to reclamation are: (i) well represented in the surrounding area, (ii) have generally low levels of biodiversity, and (iii) are not known to support distinct/unusual or otherwise critical ecosystem functions.</p> <p>An environmental offset is also proposed to seek to afford greater protection (through expansion of a Fish Habitat Area under the Queensland <i>Fisheries Act 1994</i>) to similar habitat in the local region at a ratio of 8:1. This measure will not create or restore marine habitat but will have the effect of providing a greater level of protection and management to this habitat than its current tenure and preclude the use of the area for port or other development purposes in the future.</p>
Intactness	Will the proposed action of itself, or in combination with other relevant impacts, result in the loss and/or degradation of the key features, processes and attributes of the property that express its outstanding universal value?	<p>As outlined previously in the AEIS, key natural features, processes and attributes of the WHA will not be lost as a result of the proposed action except in the context of seabed areas removed by the reclamation.</p> <p>Temporary (sub lethal) impacts are possible based on the predictive modelling for seagrass and some coral communities on the eastern coast of Magnetic Island. Mitigation is proposed (as outlined in the Dredge Management Plan) to:</p> <ul style="list-style-type: none"> ▪ imposition of a time window for the TSHD dredging that seeks to minimise impacts on ecological receptors ▪ a reactive monitoring program to validate impact assessment findings and monitor key thresholds for impacts as a trigger for corrective actions. <p>These measures seek to ensure unacceptable impacts are fully avoided and minimised as far as practicable.</p>
Threats	Will the proposed action of itself, or in combination with other relevant impacts, result in increased adverse effects of development, neglect or any other degrading process?	<p>A range of stressors have affected the condition of near-shore ecosystems in the region (as described in Section 25.0, Cumulative Impacts Assessment). In particular, recent successive natural events have resulted in a reduction of seagrass meadows throughout the region and affected the condition of coral ecosystems. However, both seagrass and coral ecosystems in the study area have been observed to be recovering following more favourable climate and weather conditions.</p> <p>Key assessment findings from the revised assessment relevant to these sensitive receptors are as follows.</p> <ul style="list-style-type: none"> ▪ Benthic habitats within soft sediments will be permanently lost through the reclamation and temporarily impacted by capital dredging with recovery times on the order of 12 – 24 months (short to medium term impacts). ▪ Turbidity and sedimentation impacts to seagrass are expected to be minor, temporary and localised as a result of the proposed dredging. ▪ Temporary (sub-lethal) impacts to coral communities are possible, based on the Worst Case scenario plumes from capital dredging of the channel particularly along the east coast of Magnetic Island. This will be a major focus of the reactive monitoring plan with the implementation of corrective mitigation measures (changed dredging practices, constrained overflow) by the dredge where ecological trigger limits are exceeded. ▪ Impacts to coral communities are not expected from sedimentation (e.g. smothering) associated with dredging.

Criterion	Questions Posed by the EPBC Guidelines for Impacts on Integrity	Response
	<p>Will the proposed action of itself, or in combination with other relevant impacts, result in an increase in processes that may cause deterioration?</p>	<p>A range of detailed mitigation and monitoring measures are proposed in the Dredge Management Plan to seek to avoid or reduce impact to these sensitive receptors including scheduling the works to occur outside of key ecological time periods and developing and implementing a reactive monitoring program with a set of corrective actions to reduce impacts.</p> <p>Environmental offsets are proposed to address residual impacts from permanent impacts including measures that will contribute to building the resilience of these receptors to future impact and commitments to fund long term monitoring of key ecosystem components.</p> <p>As outlined above, the impacts from the capital dredging program (construction phase) are not expected to impact on the integrity of the OUV of the property. Potential operational phase impacts are outlined below:</p> <p><u>Increased shipping and risks associated with spills, groundings, megafauna interaction</u> The impacts from the increase in shipping associated with port expansion have been addressed in the EIS and in other studies including the Cumulative Impact Assessment (CIA) for Abbot Point. The promulgation of the Northeast Shipping Management Plan by the Australian Maritime Safety Authority as well as other measures will seek to address the additional risk of marine traffic in and around the Great Barrier Reef. The Port of Townsville is an active participant in the implementation of these initiatives.</p> <p><u>Maintenance dredging</u> The ultimate development (through construction of the eastern breakwater and subsequent shadowing of the outer harbour and channel) is estimated to result in an increase of approximately 14% to the annual maintenance dredge volume to what is currently experienced at the port for an additional 6 berths.</p> <p>There will likely be a period of increased maintenance volumes prior to the construction of the breakwater as a result of channel widening (an estimated 17% greater than the current annual maintenance dredge volumes). This is discussed in Section 5.0 (Coastal Processes).</p> <p>Further assessment of this maintenance dredging is presented in Section 6.0 (Marine Water Quality).</p> <p>Suitability of the material for at sea placement.</p> <p>A full sediment chemistry assessment will be undertaken prior to works and any material not suitable for at sea placement under the NAGD will be placed in the reclamation. This process is assured by the requirement to obtain a Sea Dumping Permit prior to the works being carried out. This process also applies to future maintenance of channels, swing basins and berths associated with port expansion.</p>

Strategic Assessment

As outlined in the Legislation and Policy section, improving understanding and management of environmental impacts from dredging and dredged material disposal in the GBRWHA was a key recommendation of the Strategic Assessment.

In this context, the PEP design refinement is consistent with the relevant conclusions and findings of the Strategic Assessment for the following reasons.

- The design refinement no longer includes marine placement of the capital dredge material in accordance with relevant Commonwealth and State legislation.
- The numerical modelling assessment that has been undertaken for the AEIS is fully compliant with the Great Barrier Reef Marine Park Authority Hydrodynamic Modelling Guidelines (finalised following the release of the EIS). The modelling also takes into account the prospective effects of offshore currents as well as the effect of extreme weather events such as cyclones on dredged material re-suspension. The hydrodynamic model used for the assessment is fully 3D and calibrated and validated using 12 months of locally collected wave, current and water quality data. The model has been independently peer reviewed by Doug Treloar (Cardno Lawson Treloar) and also reviewed by AIMS.
- The associated water quality and ecological assessment approach employs the use of geographic 'zones of impact' based on the WA EPA (2011) environmental dredging guideline approach. This approach examines both the acute and chronic impacts from dredging and material placement using extensive baseline monitoring data (>12 months continuous data) and establishes indicative local trigger levels (to be reviewed and approved by a Technical Scientific Committee) to assess impacts to seagrass and coral habitats. As outlined elsewhere in the assessment, sensitive receptors in Cleveland Bay such as seagrass and coral reef habitats along Magnetic Island are within the 'zone of influence' and 'zone of low impact' (during the worst case scenario). 'Zones of moderate impact' and 'zones of high impact' are not expected in sensitive receptor areas. The cumulative impacts assessment presented in Section 25.0 follows the framework presented in the Strategic Assessment. The relative impacts of mitigated dredging operations are predicted to be small by comparison to impacts from other stressors operating in the region, however are proposed to be closely managed during dredging.

Reef 2050 Plan

The PEP design refinement addresses the three key actions in the 2050 Plan that are relevant to capital dredging and placement. These are:

- WQA 14 – restricting the development of new or expansion of existing port facilities to within the regulated port limits of Townsville
- WQA 18 – compliance with the legislative requirement to ban at-sea disposal of port-related capital dredge material
- WQA 19 – mandating the beneficial re-use of port related capital dredge spoil through land reclamation in port development areas.

The other actions in the 2050 Plan relevant to ports and dredging relate to future studies or strategies that are to be completed by port authorities across the Region in consultation with relevant agencies, as opposed to specific project level commitments or requirements. The proponent will continue to participate in these studies as they progress.

26.3.4.2 Mitigation measures

No additional mitigation measures are proposed specifically to address OUV, noting specific measures are proposed to protect marine habitats (seagrass, corals) and water quality through the Dredge Management Plan (Appendix B1).

26.3.5 Summary

Table 26.4 provides a summary of the risk of impacts to OUV.

Table 26.4 Summary of Risk of Impacts to OUV

Element	Primary Impacting Process	Updated Risk Rating			Mitigation Measures	Mitigated Risk Rating
		Magnitude	Likelihood of impact	Risk Rating		
Impacts on the OUV of the GBRWHA	Construction / Operation	Moderate - High	Possible	Medium	As outlined elsewhere in this AEIS including the Dredge Management Plan	Low

26.4 Conclusion

Submitters sought information on how the Project may impact OUV of the GBRWHA. This assessment has found with respect to impacts on the Attributes of the WHA that the proposed Project is:

- not likely to significantly detract from the present natural beauty of the property (Criterion vii)
- is not likely to have an adverse impact on key interrelated and interdependent elements and their natural relationships (Criterion viii)
- significant impacts to the area's ecosystems and biodiversity are not expected but there will be highly localised impacts on soft sediment habitat (permanently removed by reclamation) and temporary impacts on other key receptors through changes to water quality as a result of dredging (particularly seagrass and coral communities). These impacts on water quality will be monitored as part of both reactive and long term ecosystem monitoring outlined by the Project EIS and in accordance with mitigation and monitoring commitments set out in the Dredge Management Plan. Environmental offsets are also proposed to address residual impacts from the proposal on ecosystems and biodiversity (Criterion ix)
- the Project will not remove or have flow on effects on habitats required to maintain the diversity of fauna and flora in the WHA (Criterion x)
- While there will be permanent benthic habitat loss as a result of the reclamation area, the area of temporary benthic habitat loss from capital dredging will be reduced by 1,140 ha (area of DMPA) compared to the EIS as a result of the revised design in the AEIS (which no longer includes marine placement of capital dredge material at the DMPA) (Criterion ix).

In relation to retaining the Integrity of the WHA, the Project is:

- not expected to cause additional loss to any whole OUV element (Wholeness Criterion)
- while there will be a reduction in the size of the WHA property by 0.0004%, with the proposed mitigation and offsetting the Project is not expected to reduce the WHA's outstanding value (Intactness Criterion)
- some adverse effects are predicted, namely turbidity and sedimentation impacts to seagrass which are expected to be minor, temporary and localised as a result of the proposed dredging and temporary (sub-lethal) impacts to some coral communities on the north east coast of Magnetic Island are possible. Preventing these impacts will be a major focus of the reactive monitoring program with the implementation of corrective mitigation measures (changed dredging practices, constrained overflow) by the dredge if ecological trigger limits are reached.

Coupled with the cumulative impacts assessment findings and this section's assessment of compliance with the Strategic Assessment and the 2050 Plan, the revised PEP is considered to be consistent with policy frameworks at the Commonwealth and State level.