Initial and Concluding Analyses - Abbot Point

Priority Ports Master planning - Planning and Environment Analysis

Queensland Government Department of Transport and Main Roads

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Advisian
Worley Group

advisian.com

Disclaimer

Company details

Advisian Pty Ltd
ABN 50 098 008 818

Level 31, 12 Creek Street
Brisbane QLD 4000
PO Box 15081, City East QLD 4002
Australia

T: +61 7 3377 7000
F: +61 7 3377 7070

PROJECT 311012-01182 - REP-001: Initial and Concluding Analyses - Abbot Point - Priority Ports Master planning - Planning and Environment Analysis

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0	Issued for use	Stanislas Leger	Bill Boylson	Duncan Foster	5.08.22

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Acknowledgement of country

Advisian acknowledges the Traditional Owners and Custodians of this country throughout Australia and their connections to land, sea and community. We pay our respect to their Elders past, present and emerging, and extend that respect to all Aboriginal and Torres Strait Islander people today. Advisian is committed to reconciliation among all Australians.

Executive summary

Initial analysis

The Queensland Government is advancing master planning for the Priority Port of Abbot Point in accordance with the *Sustainable Ports Development Act 2015* (Ports Act). The Department of Transport and Main Roads (TMR) is leading this work in collaboration with planning and development decision makers. The master plan will outline the long-term outlook for the future development of the Priority Port of Abbot Point consistent with the principles of ecologically sustainable development and in alignment with the Reef 2050 Plan. A port overlay will be the statutory instrument to ensure the master plan's outcomes are delivered across the master planned area.

The master plan process is founded on an evidence base which has been gathered to:

- Inform the preparation of the master plan by analysing the economic, environmental, cultural heritage and social values relevant to the priority port, including the Outstanding Universal Value (OUV) of the Great Barrier Reef World Heritage Area (GBRWHA)
- Identify long-term infrastructure, supply chain, and port development requirements
- Undertake an assessment of the regulatory framework to understand how impacts from development will be sustainably managed.

TMR developed a method to achieve consistency in what information on the environmental, social, cultural and economic values is relied upon, how regulatory gaps are identified and how port master planning tools' efficacy is verified. The method guides the process of identification, analysis and review of land use and environmental matters relevant to the master planning of priority ports, comprising three steps:

- Evidence gathering – collation of base information to be considered during master planning
- Initial analysis – preliminary analysis of the evidence base for risks, information gaps, and planning issues or risks to be managed
- Concluding analysis – analysis of the effectiveness of proposed master plan and port overlay measures developed in response to matters identified through the initial analysis.

Initial and concluding analyses are the focus of this report. Evidence gathering undertaken to support the master planning process, including the initial analysis, is presented in the Evidence Base Report prepared by TMR August 2022 for the Priority Port of Abbot Point (EBR). Concluding analysis was undertaken after the draft master plan and draft port overlay had been developed.

The initial analysis focused on the management of potential port-related development impacts (micro level impacts) by the existing regulatory frameworks operating in the study area. The analysis considered likely future development activities and associated potential impacts and was not centred on specific projects or development scenarios. It provided an assessment of whether potential impacts on identified values at or near the port are subject to the control of existing management measures i.e., existing legislative and planning instruments. Evidence with respect to infrastructure, port optimisation, forward planning and macro level impacts to port operations, such as external trade influences, was not considered in the initial analysis and is addressed separately in master plan and port overlay development (Figure E-1).

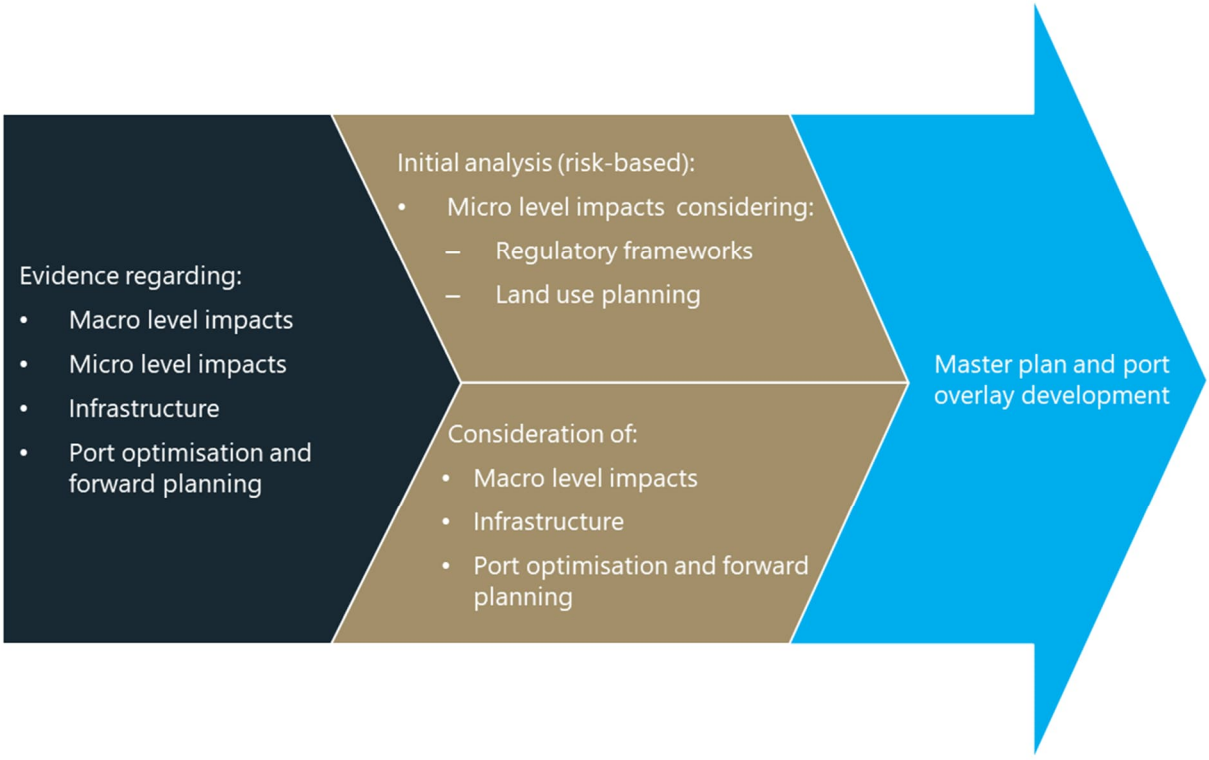

Figure E-1 Consideration of evidence base in initial analysis

The initial analysis applied a risk-based approach to identify matters that may need to be addressed in preparation of the master plan and port overlay (Figure E-2). The contribution of attributes to the OUV of the GBRWHA was flagged in the risk assessment table for each environmental value and was considered explicitly in the risk assessment.

The assessment of initial risk considered potential future development at the port including:

- Location of development with reference to values within the study area that may be impacted
- Types of development likely to be proposed in the study area and how these may impact values present.

Post-management risk analysis took account of existing management measures that may control risk associated with impacts to specific values.

Value	OUV	Potential impacts, threats or pressures	Development activities	Initial risk	Existing management measures	Post management risk	Matters for consideration	Summary conclusion

Figure E-2 Outline of risk assessment table considerations

There are several spatial planning instruments currently applied to land within the port area, including the Abbot Point State Development Area (APSDA) development scheme, the Whitsunday Regional Council (WRC) planning scheme and the Port of Abbot Point Land Use Plan (LUP).

The analysis assumed that development activities may occur on Strategic Port Land (SPL), land within the APSDA as well as surrounding areas within the WRC planning scheme, and that marine activities would be in port limits. The analysis also contemplated potential impacts that may occur across the boundaries where relevant planning instruments interface e.g., development activities within the WRC planning scheme area with potential impact to future development within the APSDA, and vice versa.

Findings

There is a complex, comprehensive, and overlapping range of Commonwealth, Queensland and local government regulatory and policy instruments that are relevant to the Priority Port of Abbot Point. The application of this regulatory framework is of significant complexity due to:

- Jurisdictional overlap of instruments between the Commonwealth, Queensland and local governments
- Spatial overlap of instruments, including their application over both land and marine areas
- Need to balance management of economic, environmental, cultural and social values present.

Key management measures applicable to proposed development at the Port of Abbot Point are contingent on the development location, scope of activity and the values potentially impacted:

- Dependent on location and activity, new port development requires approval of land use under:
  - The development scheme for the APSDA for development within the APSDA
  - The LUP and associated port development guidelines for development within SPL
  - The WRC planning scheme for development within the WRC area
  - The GBRMP Act for development within the marine park.
- Dependent on activity and/or values potentially impacted, new port development will require:
  - Approval under the *Planning Act 2016*, with consideration of associated legislation and codes
  - Environmental Authority under the *Environmental Protection Act 1994*
  - Approval under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
  - Approval under the *Environment Protection (Sea Dumping) Act 1981*.

The Commonwealth, State, local government and port instruments regulate potential impacts from proposed development within their respective remit. They also complement each other to create a mesh able to regulate potential impacts from proposed development of various magnitude.

Application of existing management measures (i.e., the existing regulatory and planning framework) reduces the risk rating for all potential impacts to values present at the Priority Port of Abbot Point to ‘low’ except for potential impacts on environmental values due to climate change.

Regulatory gaps - climate change

Impacts associated with climate change, such as elevation of ocean surface temperature, increasing ocean acidification, sea level rise and increased frequency and intensity of storm events and storm surge were identified as potentially impacting environmental values of marine and estuarine water quality, coastal processes, marine plants and coral reefs. The post-management risk rating for potential impact to these environmental values was assessed as ‘high’ and ‘medium’ because:

- The contribution of new development to climate change-related threats is not addressed by any regulatory and planning instruments
- Several values at risk from climate change impacts are local attributes of the OUV of the GBRWHA, including diversity of seagrass, coral reefs, coral reef ecosystems, inshore fringing reefs, mid-shelf reefs, and exposed outer reefs, hard and soft corals, and coral spawning.

Relevant considerations for potential management of climate change-related impacts in master planning for the Priority Port of Abbot Point may include:

- The Commonwealth Government currently has a national commitment to net zero greenhouse gas emissions by 2050
- The Ports Act requires development of port master plans that establish a long-term vision for the future development of priority ports consistent with the principles of ecologically sustainable development, as defined in the EPBC Act.

Geographical coverage

Through completion of the initial analysis, consideration was given to the geographical coverage of the master plan area. It was noted that no land use planning instruments relevant to the Priority Port of Abbot Point address an area of mangroves and tidal flats to the west of Curlewis Bay. This area receives surface water drainage from adjacent areas, including the Caley Valley Wetlands, most of which are regulated under the APSDA development scheme and/or the Port of Abbot Point LUP.

Matters to be considered

Based on the assessment outlined here, the following matters should be given further consideration during development of the master plan and port overlay:

- The master plan will include a series of objectives and desired outcomes. The issue of climate change and its potential impacts could potentially be addressed through one or more of these statements
- Consideration may be given to inclusion of the Curlewis Bay mangroves and tidal flats in the master planned area to support achievement of coherent and holistic port environmental management outcomes.

Concluding analysis

As outlined in the TMR Method, the concluding analysis involved:

- Assessment of matters identified as a high post management risk during the initial analysis
- Assessment of all areas within the master planned area to ensure no inadvertent increase to the post-management risk profile of identified values from implementation of the master plan
- Assessment of any remaining matters that may require further consideration or management but are outside of the scope of master planning.

One climate change-related risk is rated ‘high’ post-management. However, it was found to be beyond the land use management scope of the master plan and port overlay and must be addressed through higher level policies and legislation.

A single Priority Management Measure (PMM) was created to protect and enhance the Caley Valley Wetlands. It reinforces, and is consistent with, the requirements of existing management measures. Due to the comprehensiveness of existing management measures, the draft port overlay only seeks to guide plan-making under the *Planning Act 2016, Transport Infrastructure Act 1994 and State Development and Public Works Organisation Act 1971,* and does not establish controls for proposed development. Consequently, it was found that there is no risk of inadvertent increase to the post-management risk profile of identified values from the master plan implementation. Undertaking a detailed risk assessment as stipulated in the TMR Method was considered unwarranted.

Remaining matters outside of the scope of master planning implementation are the climate change-related risks. Government is beginning to address these through higher level policies and legislation.

Acronyms and abbreviations

Acronym/abbreviation	Definition
APSDA	Abbot Point State Development Area
ASS	Acid sulfate soils
DEO	Desired Environmental Outcomes
EBR	Evidence Base Report prepared by TMR August 2022
EIS	Environmental Impact Statement
EP Act	*Environmental Protection Act 1994*
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
ERA	Environmentally Relevant Activity
GBR	Great Barrier Reef
GBRMP	Great Barrier Reef Marine Park
GBRMP Act	*Great Barrier Reef Marine Park Act 1975*
GBRWHA	Great Barrier Reef World Heritage Area
IAR	Impact Assessment Report
LUP	Land Use Plan
Min	Minor contribution
MNES	Matter of National Environmental Significance
MSES	Matter of State Environmental Significance
NQBP	North Queensland Bulk Ports
OUV	Outstanding Universal Value
PASS	Potential acid sulfate soils
Planning Act	*Planning Act 2016*
Planning Regulation	*Planning Regulation 2017*
Ports Act	*Sustainable Ports Development Act 2015*
Reef 2050 Plan	Reef 2050 Long-Term Sustainability Plan 2021–2025
SDA	State Development Area
SDAP	State Development Assessment Provisions
SDPWO Act	*State Development and Public Works Organisation Act 1971*
Sea Dumping Act	*Environment Protection (Sea Dumping) Act 1981*

Acronym/abbreviation	Definition
Sig	Significant contribution
SIA	Social Impact Assessment
SPL	Strategic Port Land
SPP	State Planning Policy
TEC	Threatened Ecological Community
TIA	*Transport Infrastructure Act 1994*
TMR	Queensland Department of Transport and Main Roads
TMR Method	Methodology for planning and environmental analysis to inform priority port master planning, May 2021, Draft
WRC	Whitsunday Regional Council
WRC planning scheme	Whitsunday Regional Council Planning Scheme 2017

1 Introduction

The Reef 2050 Long-Term Sustainability Plan 2021–2025 (Commonwealth of Australia 2021) (the 'Reef 2050 Plan') is a comprehensive plan developed by the Australian and Queensland governments in 2015 to secure the health and resilience of the Great Barrier Reef. Consistent with the Reef 2050 Plan, the protection of the Outstanding Universal Value (OUV) of the Great Barrier Reef World Heritage Area (GBRWHA) is an intrinsic consideration in port development.

In accordance with the *Sustainable Ports Development Act 2015* (Ports Act), the Queensland Government is advancing master planning for the Priority Port of Abbot Point. The port master planning process delivers master plans and port overlays for Queensland's four priority ports. On behalf of the Queensland Government, the Department of Transport and Main Roads (TMR) is leading this work in collaboration with planning and development decision makers.

Master plans are strategic documents that outline the long-term outlook for the future development of priority ports consistent with the principles of ecologically sustainable development. Port overlays are the statutory instruments that ensure a master plan's outcomes are delivered across the master planned area.

The master plan process is founded on an evidence base which has been gathered to:

- Inform the preparation of the master plan by analysing the economic, environmental, cultural heritage and social values relevant to the priority port, including the OUV of the GBRWHA
- Identify long-term infrastructure, supply chain, and port development requirements
- Undertake an assessment of the regulatory framework to understand how impacts from development will be sustainably managed.

Applying an evidence-based planning approach is in accordance with an action from the original Reef 2050 Plan to "*Ensure Great Barrier Reef ports planning incorporates evidence-based measures to support protection, restoration and management of coastal ecosystems that contribute to Reef health and resilience (EHA25)*".

The regulatory framework that exists in and around the Priority Port of Abbot Point is complex, and the extent of environmental, cultural heritage and social values present contributes a further challenge to planning and environment analysis. The master planning process seeks to define and analyse this complex setting to establish a long-term coordinated strategy to guide development outcomes at the priority port over the next 30 years.

1.1 Context

1.1.1 The Port of Abbot Point

The Priority Port of Abbot Point is on the North Queensland coast between Townsville to the north and Mackay to the south. Bowen is the closest town to the port and has a population of approximately 10,000. The port is in the local government area of Whitsunday Regional Council (WRC) and the port authority is North Queensland Bulk Ports Ltd (NQBP).

The port is a dedicated coal terminal servicing the Bowen Basin coalfields and achieved throughput of 31.9 million tonnes in 2019–20. Offshore port infrastructure is within port limits and outside of the Great Barrier Reef Marine Park (GBRMP). The onshore port area is within the Abbot Point State Development Area (APSDA). Access to the port is provided by road, rail and sea. Abbot Point Road connects the port to the Bruce Highway. The Collinsville-Newlands Rail Line links the port to the Goonyella Coal System. During 2019-20 the port generated 395 ship visits.

1.1.2 Master planning process

A master plan is a strategic document providing policy direction that is implemented by a port overlay to guide future development in the master planned area.

Master plans and port overlays are intended to complement rather than duplicate current regulatory frameworks. They are developed on a regulation by exception basis, thereby allowing existing plan-making and approval processes to continue where they adequately regulate development to the extent needed to achieve the master plan outcomes. Analysis of the regulatory frameworks affecting future planning and development at the port supports the goal of regulation by exception and avoids unnecessary burden on proponents and decision makers.

This initial analysis considered the current regulatory context for land use planning and marine areas to establish whether regulatory gaps exist that may require additional controls to support the long-term vision in the master plan. The management measures considered include:

- Environmental assessment controls
- Planning and development processes
- Marine area management requirements.

The evidence base and initial analysis inform development of the draft master plan and port overlay for the Priority Port of Abbot Point.

Following preparation of the draft master plan and port overlay, the concluding analysis section of this report was prepared. The concluding analysis is based on the initial analysis of the existing regulatory framework combined with the management measures introduced by the draft master plan and draft port overlay.

1.2 Structure of report

This report is structured as follows:

- Section 1 (this section) provides an introduction and context to the initial analysis
- Section 2 describes the approach undertaken to analysis
- Section 3 provides an overview of areas of port development, development types and existing management measures
- Section 4 describes the risk assessment process applied
- Section 5 sets out findings of analysis with a detailed risk assessment table provided in Appendix A
- Section 6 describes additional analysis of matters which required further consideration as part of master plan and port overlay development

- Section 7 presents the concluding analysis (assuming implementation of the measures identified in the draft master plan/port overlay)
- Section 8 lists references used in the report.

2 Approach

2.1 Study area

Evidence gathering was undertaken to support the master planning process and is presented in the Evidence Base Report prepared by TMR August 2022 for the Priority Port of Abbot Point (EBR). The EBR addressed an area that covered approximately 1,800km^2 of land and sea around the port.

For the purposes of initial analysis, it was assumed that development activities may occur on SPL at Abbot Point along with land within the APSDA and surrounding areas, including land within the WRC planning scheme area. An initial analysis study area ('the study area') was identified to represent the extent of land within which port development activity may occur. Figure 2-1 shows the study area and contrasts this with the EBR study area.

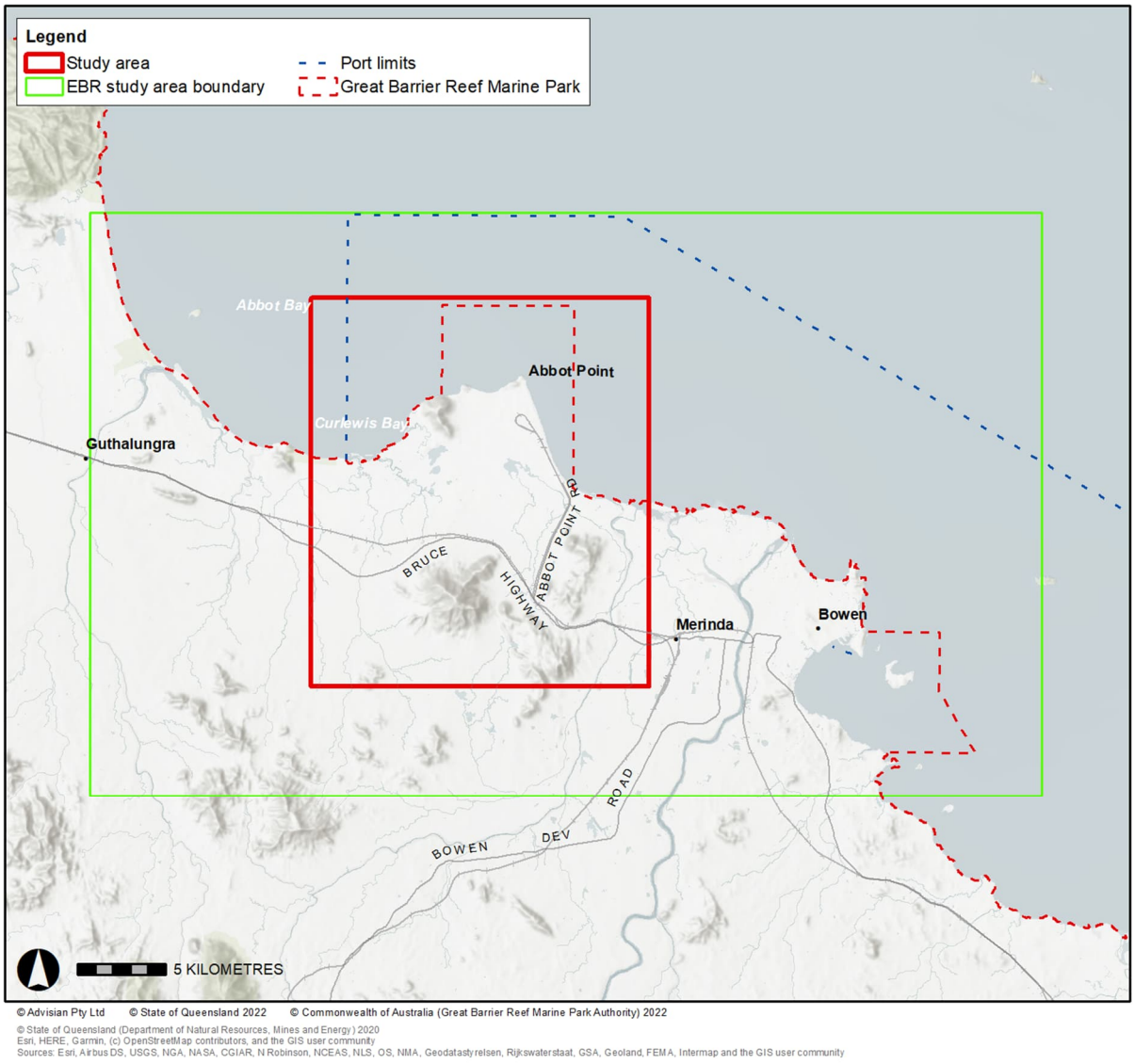

Figure 2-1 Study area

2.2 Background

Based on learnings gained through development of master plans for the priority ports of Townsville and Gladstone, TMR developed a method for planning and environmental analysis to inform priority port master planning (*Methodology for planning and environmental analysis to inform priority port master planning, May 2021, Draft*) (TMR Method). The TMR Method seeks to achieve consistency in what information on the environmental, social, cultural and economic values is relied upon, how regulatory gaps are identified and how port master planning tools' efficacy is verified. It applies an approach to identify, analyse, and review land use and environmental matters relevant to the master planning of priority ports, comprising:

- Evidence gathering – collation of base information to be considered during master planning
- Initial analysis – preliminary analysis of the evidence base for risks, information gaps, and planning issues or risks to be managed
- Concluding analysis – analysis of the effectiveness of proposed master plan and port overlay measures developed in response to matters identified through the initial analysis.

2.2.1 Evidence gathering

Review of the evidence base was completed in May 2022 and is presented in the EBR. The EBR identifies:

- Economic, environmental, cultural and social factors relevant to the priority port including OUV of the GBRWHA
- Future development activities relevant to the port and surrounding areas
- Potential impacts from development and associated activities on the values identified
- Existing Commonwealth, Queensland and local government management measures (legislation, regulation, planning instruments, policies) that apply to matters relevant to the port and its surrounding area.

2.2.2 Initial analysis

The initial analysis process was initiated through a workshop held on 28 October 2021, with Advisian and TMR personnel in attendance. The primary objective of the workshop was to achieve alignment on the risk assessment approach to be applied for the planning and environment analysis.

As agreed at the workshop, the analysis approach must align with the TMR Method, which underpins the practical application of the principles of priority port master planning and ensures consistency in port master plan development and reviews. It is notable that priority port master plans for the ports of Townsville and Gladstone were developed prior to establishment of the TMR Method in 2021. Planning and environmental analysis for those ports (including risk assessment) differs from that undertaken for the Port of Abbot Point.

The scope of what can be implemented through master planning is limited to future development. The initial analysis focused on the management of potential port-related development impacts by the existing regulatory frameworks operating in the study area. The initial analysis did not focus on specific projects or development scenarios, rather it considers likely development activities in the context of port growth and the management of their potential development impacts.

2.2.3 Concluding analysis

A concluding analysis has been undertaken to revisit the analysis with the assumed imposition of master plan and port overlay measures, developed in response to matters identified from evidence gathering and initial analysis. The concluding analysis is included in Section 7 of this document.

2.3 Overview of analysis

The initial analysis considered values (environmental, social, cultural heritage) present within the study area, potential development impacts and existing management measures (i.e., regulatory and policy instruments) that apply.

The initial analysis applied a risk-based approach to identify matters that may need to be addressed in preparation of the master plan and port overlay. The analysis provided an assessment of whether potential impacts on identified values caused by development activity at the port are subject to the control of existing management measures, such as legislative and planning instruments noting:

- The analysis focused on existence of the management measures to manage impact on the values
- The analysis did not address the implementation or administration of the measures by regulatory agencies, nor the effectiveness of existing measures
- The analysis is not an environmental impact assessment for future development.

Outputs of the initial analysis include identification of aspects that may require additional management through the master plan and port overlay.

2.3.1 Risk assessment

The analysis incorporates a risk assessment structured around the considerations shown in Figure 2-2.

Value	OUV	Potential impacts, threats or pressures	Development activities	Initial risk	Existing management measures	Post management risk	Matters for consideration	Summary conclusion

Figure 2-2 Outline of risk assessment table considerations

The matters which informed the risk-based approach (headings in Figure 2-2) are described below:

- Value refers to the environmental, social or cultural heritage values considered in the risk assessment
- OUV refers to the contribution of specific values to the OUV of the GBRWHA i.e., Minor, Moderate or Significant contribution (where relevant)
- Potential impacts, threats or pressures, refers to the potential impacts of future development on the identified values
- Development activities refers to the types of development activity that may occur, and cause potential impacts to identified values
- Initial risk refers to an assessment of risk assuming that the current suite of regulatory and policy instruments do not exist

- Existing management measures refers to the existing regulatory and policy instruments that apply to proposed development activities and manage potential impacts on identified values
- Post management risk refers to an assessment of risk with the application of existing management measures
- Matters for consideration refers to a description of how each existing management measure addresses the potential impacts of proposed development activities on identified values in support of the post management risk rating for each management measure
- Summary conclusion refers to identification of summary conclusions regarding the risk assessment of all potential impacts of proposed development activities on identified values, given the application of all existing management measures and in support of the overall post management risk rating.

2.4 Use of evidence

The EBR provides most of the inputs to the risk assessment table, including a description of the values and contributions to OUV, development activities, potential impacts and existing management measures. Potential impacts are described in the EBR at two different levels:

- Macro i.e., cumulative impact of port development and/or impact of external influences on port operations such as potential for future port trade enhancement from development in new industries, or influence of key Asian economies on Queensland's future coal demand and therefore Abbot Point's future throughput
- Micro i.e., impact of new development at the port such as a new industrial development causing environmental impacts and/or nuisance impacts on nearby residential communities.

The EBR also sets out other matters, such as existing and planned infrastructure at the Port, along with providing an overview of evidence relevant to port optimisation and forward planning.

The initial analysis focused on a sub-set of information contained in the EBR i.e., the micro level impacts of new development on values as described in the EBR, in context of the regulatory and land use planning frameworks (as illustrated in Figure 2-3). Assessment of the application of existing management measures to potential impacts of new development on values was the primary focus of the initial analysis.

To maintain traceability between the EBR and the initial analysis, the values and potential impacts used for the risk assessment tables were generally as set out in the EBR, noting that some values were assessed as a group in the risk assessment given their overlap, potential impacts and their management.

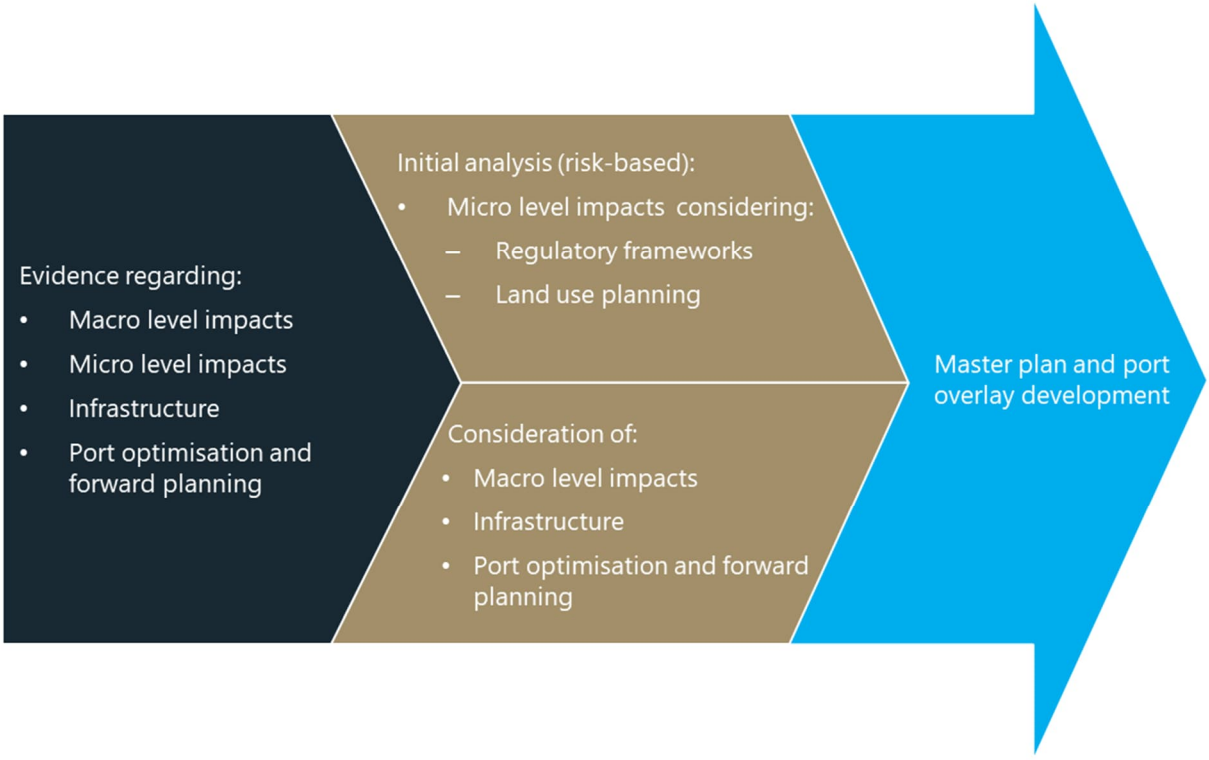

Figure 2-3 Consideration of the evidence base for master plan and port overlay development

Table 2-1 provides an overview of information provided in the EBR and how this was utilised in the initial analysis and/or may be used in the master planning process.

Table 2-1 Utilisation of EBR information

EBR information	Utilisation in initial analysis and/or master planning
Chapter 1: Executive Summary	Not applicable.
Chapter 2: Introduction	Not applicable.
Chapter 3: Port of Abbot Point Provides context to the Port including location and function	Provides broad context to the initial analysis and master planning.
Chapter 4: Regulatory frameworks Describes existing management measures relevant to the Port.	The identified existing management measures were used in risk assessment for the initial analysis.
Chapter 5: Land use planning Describes existing management measures relevant to the Port.	The identified existing management measures were used in risk assessment for the initial analysis.
Chapter 6: Social	Micro level impacts to social values of amenity of surrounding residential communities were addressed in risk assessment for the initial analysis.

EBR information	Utilisation in initial analysis and/or master planning
Describes social values and potential impacts on these. Impacts set out in the discussion of social values include both macro and micro level impacts. The micro level impacts are associated with potential impacts to amenity of surrounding residential communities due to increased noise, dust, traffic and visual impacts from new development associated with the port. Macro level impacts to social values identified in the EBR include potential impacts associated with construction activity and ongoing operations at the Port relevant to: • Population and demography • Employment and training • Housing • Social infrastructure • Broad community values (beyond the micro-level amenity impacts described above).	Macro level impacts may be reflected and/or considered in master plan and port overlay development as relevant. Existing social policy and strategic context with respect to management of social values relevant to the port area is provided in the EBR, including discussion of the Mackay, Isaac, and Whitsunday Regional Plan 2012 and the Whitsunday Regional Council Planning Scheme (WRC planning scheme). Furthermore, Social Impact Assessment (SIA), including development of social impact management measures, is required for all projects subject to an environmental impact statement (EIS) process under either the: • *State Development and Public Works Organisation Act 1971* (SDPWO Act), or • *Environmental Protection Act 1994* (EP Act).
Chapter 7: Cultural heritage Describes cultural heritage values along with potential micro level impacts to these.	Micro level impacts to cultural heritage values were addressed in risk assessment for the initial analysis.
Chapter 8: Environmental values Describes environmental values along with potential micro level impacts to these.	Micro level impacts to environmental values were addressed in risk assessment for the initial analysis.
Chapter 9: Outstanding Universal Values Describes OUV relevant to the Port.	Contribution to OUV was considered in risk assessment for the initial analysis.
Chapter 10: Climate change and natural hazards Describes natural hazards and climate change, along with relevant policies and strategies. Potential macro level impacts to infrastructure are set out in the discussion of climate change and natural hazard including: • Impact to port infrastructure and operation due to physical climate risk (including supply chain and insurance risk) such as associated with warmer temperatures, less frequent but more intense rainfall, more frequent and longer droughts and sea level rise and associated hazards • Impact to port operations and business due to the transition to a low or zero carbon economy and potentially including legal and policy risk,	Potential micro level impacts of climate change to environmental values were identified in the EBR under Chapter 8 (Environmental values) and were addressed in risk assessment for the initial analysis. Existing and planned responses to potential macro level impacts to infrastructure associated with climate change and natural hazards were detailed in the EBR. Most of the responses focus on strategies/actions to avoid hazard prone areas or mitigate and adapt to the existing and potential hazards/risks. These may be reflected in the master plan and port overlay as relevant. Further detailed consideration of these matters is set out in the relevant planning instruments (APSDA development scheme, WRC planning scheme and Abbot Point Port Land Use Plan (LUP) and port

EBR information	Utilisation in initial analysis and/or master planning
technological risk, market risk and reputational risk for port operations (transition climate risk).	authority (NQBP) Sustainable Port Development Guidelines), along with relevant building and engineering standards.
Chapter 11: Infrastructure Describes existing infrastructure along with proposed projects and potential new industry.	Provides context to the description of development activities and potential impacts considered for the initial analysis. Existing and proposed infrastructure may be reflected and/or considered in the master plan and port overlay as relevant.
Chapter 12: Economic Potential macro level impacts set out in the discussion of economic value including economic impacts to the port (positive and negative) associated with Federal and Queensland Government policy, strategy, and plans, long-term global demand for coal, global energy transition and outlook and port industry trends (such as for shipping).	Provides context to the description of development activities and potential impacts considered for the initial analysis. Economic development may be considered in the master plan and port overlay development.
Chapter 13: Port optimisation and forward planning Describes international, national, state and local policy documentation and sets out existing and planned port optimisation and forward planning.	Provides context to the description of development activities and potential impacts considered for the initial analysis. Port optimisation and forward planning may be considered in the master plan and port overlay development.
Chapter 14: References	Not applicable.

2.4.1 Values

Environmental, social and cultural heritage values of the Priority Port of Abbot Point and surrounding areas are described in detail in the EBR. For consistency and traceability, the description of values used in the EBR was generally adopted for the initial analysis:

- The description of environmental and cultural heritage values was extracted from Chapter 8 (Environmental values) and Chapter 7 (Cultural heritage) of the EBR, respectively:
  - Several values were aggregated for the purposes of risk assessment given that potential impacts to these values are addressed concurrently by relevant management measures
  - Aspects of the environment such as climatic conditions and topography, soils and geology (including actual and potential acid sulfate soils (ASS / PASS)) were not specifically categorised as values, but identified in the analysis within other values and / or with respect to potential impacts as relevant
  - Biosecurity is not identified as an environmental value, but weeds and pests were considered as part of potential impacts to the identified values.
- The description of social values was derived from Chapter 6 (Social) and Chapter 8 (Environmental values - 8.2 Landscape and visual amenity, 8.10 Air quality, and 8.11 Noise emissions) of the EBR.

OUV is the central concept of the World Heritage Convention. The EBR provides detailed analysis of the attributes of the Port of Abbot Point and surrounding areas with respect to their contribution to the OUV of the GBRWHA. Key findings of that analysis indicate that several attributes provide either a minor (Min) or significant (Sig) contribution (set out in detail in Section 4.3).

2.4.2 Potential impacts, threats and pressures

Potential impacts of development to the environmental, social and cultural heritage values of the Port of Abbot Point and surrounding areas are described in detail in the EBR. As described in Section 2.3, the initial analysis focused on the micro level impacts described in the EBR (i.e., impact of new development activity at the port) in context of the regulatory frameworks and land use planning. The EBR identifies direct and indirect impacts of port development activity and both are considered in the risk assessment.

In some instances, the impacts identified in the EBR were specific to the types of development that currently exist at the Port. Noting that regulatory and planning frameworks address the management of values and potential impacts on these for the full range of potential development activity, the initial analysis considered the potential impacts in a broad sense as described in Section 4.4. By way of example, the EBR identified potential impacts of coal terminal development at Abbot Point, such as deposition of coal dust. The initial analysis addressed potential impacts associated with any potential development activity that could cause the emission and deposition of dust more generally.

In line with the approach for description of values and for consistency and traceability, the description of potential impacts used in the EBR was generally adopted for the initial analysis:

- The description of potential impacts to environmental and cultural heritage values was extracted from Chapter 8 (Environmental values) and Chapter 7 (Cultural heritage) of the EBR respectively:
  - As noted in Section 2.4.1, several values were aggregated for the purposes of risk assessment given that potential impacts to these values are addressed concurrently by relevant management measures
  - Potential impacts associated with topography, soils and geology (including ASS/PASS) were considered with reference to several values including marine and estuarine water quality, marine plants, coral reefs, fish and fish habitat areas, terrestrial vegetation communities and ecosystems, listed threatened and migratory species and associated habitat, surface water resources, groundwater resources and wetlands
  - Potential impacts associated with climate change were considered under relevant values, including marine and estuarine water quality, coastal processes, marine plants and coral reefs
  - Potential impacts associated with weeds and pests were considered with reference to the value of terrestrial vegetation communities and ecosystems
- The description of potential impacts to social values was derived from Chapter 6 (Social) and Chapter 8 (Environmental values – 8.2 Landscape and visual amenity, 8.10 Air quality, and 8.11 Noise emissions) of the EBR.

2.5 Gap analysis

Following completion of the initial analysis in alignment with the TMR Method, additional analysis of identified gaps was undertaken to identify matters to be considered further in the preparation of the master plan and port overlay.

3 Port development

The assessment of initial risk considered potential future development at the port including:

- Location with reference to values within the study area that may be impacted
- Types of development likely to be proposed in the study area and how these may impact values present.

Post-management risk analysis took account of existing management measures that may control risk associated with potential impacts to particular values regardless of the scale of the development.

3.1 Areas of port development

Consideration was given to where development activities may occur within the study area and potential impacts on the values set out in the EBR.

3.1.1 Planning context

There are several spatial planning instruments currently applied to land within the study area, including the APSDA development scheme, WRC planning Scheme and the Port of Abbot Point LUP as summarised in Table 3-1. Figure 3-1 shows the study area with reference to relevant spatial planning instruments.

Table 3-1 Summary of existing spatial planning instruments

Instrument	Summary
APSDA development scheme	Prepared by the Coordinator General, this plan identifies targeted land use precincts for all land within the APSDA. The development scheme includes a development assessment framework for making, assessing and deciding applications and requests to develop land within the APSDA.
WRC planning scheme	The WRC planning scheme operates alongside a suite of policies developed by the WRC for land within the study area.
Port of Abbot Point LUP	The Port of Abbot Point LUP is a framework for the development of SPL held by NQBP. It establishes a vision for the port, identifies existing and proposed uses and operates in conjunction with a set of development guidelines.

The analysis assumed that development activities may occur on SPL, land within the APSDA as well as surrounding areas within the WRC planning scheme, and that marine activities would be in port limits. The analysis also contemplated potential impacts that may occur across the boundaries where relevant planning instruments interface e.g., development activities within the WRC planning scheme area with potential impact to future development within the APSDA, and vice versa.

It is noted that within the study area two parcels of land are not currently zoned under one of the instruments identified in Table 3-1. These two parcels of land are located on the north west and north east of Abbot Point and fall within the intertidal zone. Although not subject to the zoning/precincts identified in Table 3-1, development of this land is still subject to the *Planning Act 2016* (Planning Act).

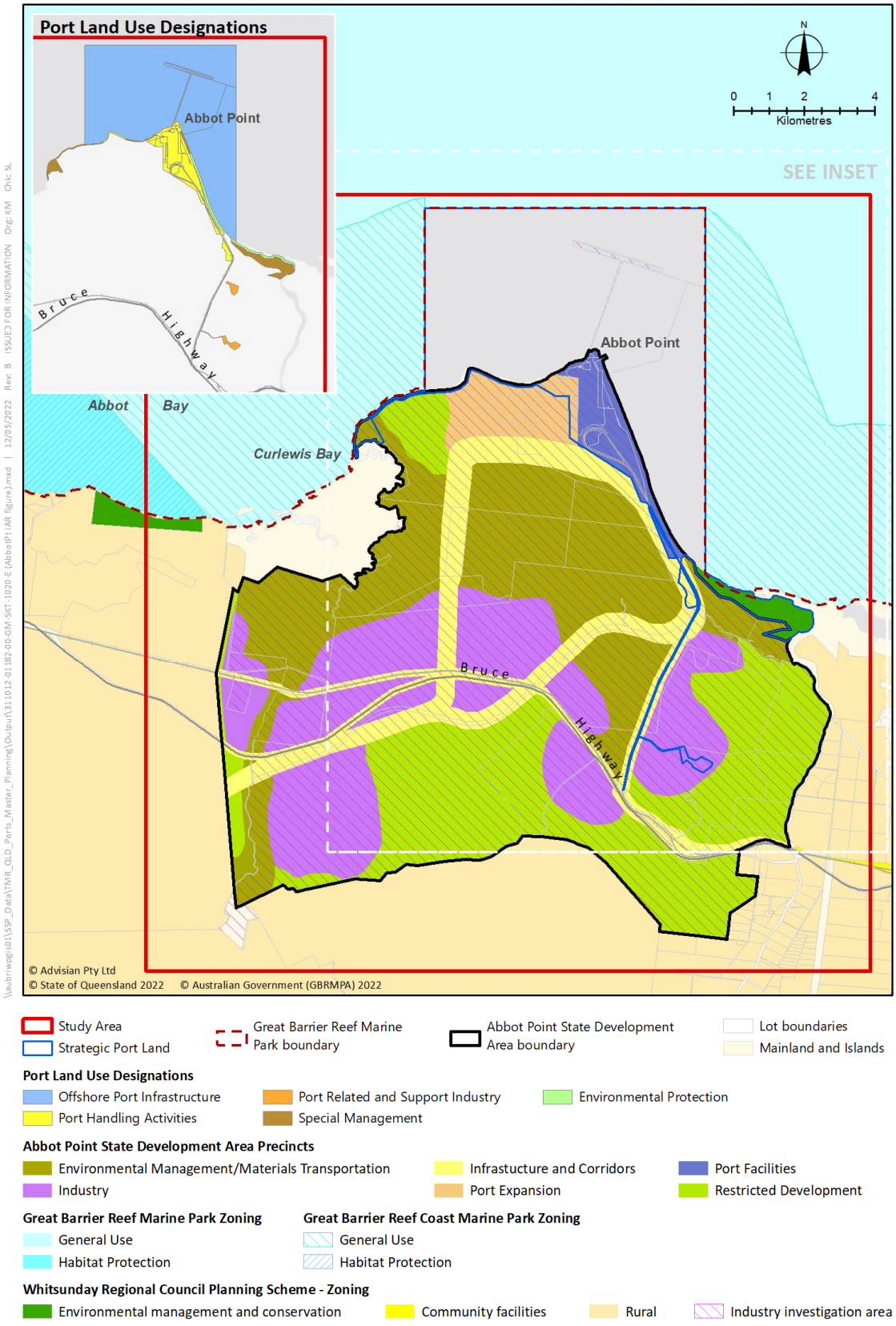

Figure 3-1 Study area and spatial planning instruments

3.1.2 Values

Land and marine zones in the study area contain sensitive terrestrial and marine environments of national and international significance. These are recognised and protected through Commonwealth and Queensland Government legislation. Part of the study area is within the GBRWHA.

The landscape includes a complex mosaic of a diverse range of habitats including mangroves, saltmarshes, saline grasslands and sedgelands, vegetated swamps, mountainous landforms such as Mount Roundback and Mount Luce, dunes and wetlands, coastal vine thickets and tussock grasslands. Marine areas support rich coastal ecosystems, supporting values such as corals, seagrass, turtles, dugong, whales and dolphins.

Caley Valley Wetlands

The Caley Valley Wetlands is an important environmental asset providing significant cultural value to the Juru people. It is a nationally important wetland and habitat for large numbers of threatened migratory birds and shorebirds, many migrating from around the globe. It also contains a diverse range of habitat for many plant and animal species, coastal open waters, mangrove forests, marsh areas, lakes and streams.

The proximity of the Caley Valley Wetlands to the GBRWHA provides connectivity between the reef and other aquatic environments. It also provides abundant feeding, roosting and breeding areas, all of which make a significant contribution to the OUV of the GBRWHA.

3.1.2.1 Environmental values that contribute to the local expression of Outstanding Universal Value

Master planning ensures that the OUV of the GBRWHA is an intrinsic consideration in managing port-related development. The local expression of OUV in and around the Port of Abbot Point predominantly arises from the significant contribution of species diversity involving both marine and terrestrial species:

- Seabirds and migratory shorebird are key environmental values that have international environmental significance. Migratory shorebirds forage and roost in intertidal mudflats, sandy beaches, salt pans and rocky intertidal areas and include a significant number of threatened and endangered species.
- Loggerhead turtles, Green turtles, Leatherback turtles, Hawksbill turtles, Olive-ridley turtles and Flatback turtles are present. Green turtles nest at Edgecumbe Bay and small populations near the mouths of Saltwater Creek and Euri Creek.

Coral reefs are located away from port operations at Camp Reef, Middle Island Reef, Holbourne Island, Stone Reef, North Head Reef and Thomas Reef consisting of near-shore and mid-shelf reefs comprising hard and soft corals.

All attributes contribute to the structure and diversity of the local ecosystem.

3.1.2.2 Other environmental and heritage values

Important terrestrial, aquatic and marine ecological values are present within the study area that are not identified as directly contributing to the OUV of the GBRWHA. The study area supports a range of environmental values, particularly terrestrial, aquatic and marine ecological values.

Indigenous cultural heritage: land and sea country are significant for social and cultural practices for the Juru people

The Traditional Owners of the land and sea country are the Juru people with land and marine areas highly significant and connections actively maintained.

Freshwater, marine and estuarine water quality: marine waters, fresh waters, and aquatic ecosystem values providing ecosystem services and protected under Queensland Government legislation

The major waterways include Saltwater, Euri and Splitters Creeks, with waterways draining northwards towards Abbot Bay and the Coral Sea. There are also three wetlands of national importance - Caley Valley Wetlands, Southern Upstart Bay and the GBRMP.

Listed threatened and migratory species: identified under international agreements and protected under Commonwealth Government legislation

A diverse range of species including threatened ecological communities, endangered and vulnerable species can be found within and surrounding the master planned area. Marine mammals include Blue Whale, Humpback Whale and Dugong. The area provides habitat for the transition of humpback whales on their southern migration from calving grounds while the Indo-Pacific humpback dolphin and Australian snubfin dolphin are also present.

Protected areas: including National Parks and Conservations Parks, listed under the provisions of Commonwealth and Queensland Government legislation

Protected areas include Cape Upstart National Park, Abbot Bay Conservation Park, Gloucester Island National Park and the GBR Coast Marine Park providing environmental conservation and recreational opportunities.

Regional ecosystems: remnant vegetation and ecological communities identified and protected under Commonwealth and Queensland Government legislation

There are several remnant vegetation communities including vegetated mountains, riparian areas and islands providing habitat for native fauna and flora, and ecological connectivity.

Mangroves and marine plants: provide habitat and food sources for a range of invertebrates, birds and fish and protected under Queensland Government legislation

There are approximately 673 hectares of mangrove forests within the Caley Valley Wetlands. There are Mangroves on Cape Upstart Island, North Head Island and Stone Island.

Seagrass and macroalgae: located in offshore areas and attract dugongs to forage between the Dugong Protection Area at Upstart Bay and the Dugong Sanctuary at Edgecumbe Bay.

3.2 Development types

The initial analysis includes risk assessment of potential impacts from particular land uses that were considered most relevant to future port and port-related development.

The risk assessment used similar land use definitions as are applied in the APSDA development scheme and the WRC planning scheme. The definitions adopted are set out in Table 3-2. The development types apply to both marine and land development.

Table 3-2 Development types applied for initial analysis

Development type	Description	Examples
Special development	Development with one or several of the following attributes: • potential for extreme[1] impacts on sensitive land uses and values • potential for extreme offsite impacts in the event of fire, explosion or toxic release • the development may involve the storage and handling of large volumes of dangerous goods • the development requires significant separation from other uses.	Marine Multi-berth or swing basin capital dredging, large-scale reclamation Land Producing, refining or processing gas or fuel gas, major hazard facility involving manufacturing of dangerous goods, rendering plants, oil refineries, waste incineration, manufacturing/storing chemicals, explosives, fertilisers involving ammonia
High/medium impact development	Development with one or several of the following attributes: • potential for significant[2] impacts on sensitive land uses and values • potential for significant offsite impacts in the event of fire, explosion or toxic release • the development may involve the storage and handling of moderate volumes of dangerous goods.	Marine Single berth capital dredging, medium/small reclamation, large jetty and loading platform on trestles, tug harbour Land Dredged material storage cells, transport infrastructure, pipeline (gas, liquids) concrete batching plant, boiler making, metal foundry, major hazard facility for the storage and distribution of dangerous goods not involving manufacturing processes, abrasive blasting, enamelling, galvanising, spray painting
Low impact development	Development with the following attributes: • limited impacts on sensitive land uses and values • offsite potential impacts from storage of dangerous goods are low level.	Marine Marine offloading facility, small jetty and loading platform on trestles, floating tug berth, maintenance dredging Land Storage sheds, offices, local roads, water pipeline

Notes: 1= reaching a high or the highest degree, 2= sufficiently great or important to be worthy of attention; noteworthy.

3.3 Existing management measures

As set out in the EBR, there is a complex, comprehensive, and overlapping range of Commonwealth, Queensland and local government regulatory and policy instruments that are of relevance to the Priority Port of Abbot Point and surrounding areas.

The application of this regulatory framework is of significant complexity due to the:

- Jurisdictional overlap of instruments between the Commonwealth, Queensland and local governments
- Spatial overlap of instruments, including their application over both land and marine areas
- Need to balance management of economic, environmental, cultural and social values present.

Existing management measures are described in detail in the EBR:

- Chapter 4 (Regulatory frameworks) of the EBR provides an overview of the Commonwealth, Queensland and local government regulatory framework and summarises its application
- Chapter 5 (Land use planning) describes land use planning and development assessment requirements that apply in the study area including how the existing management measures apply to development proposals within land and marine areas.

Table 3-3 sets out the relevant existing Commonwealth, Queensland and local government management measures identified in the EBR and considered in the initial analysis. It should be noted that the regulatory framework identified is supported by additional instruments e.g., exploration or production activity for petroleum and gas in Queensland requires approval under the *Petroleum and Gas (Production and Safety) Act 2004*. These additional instruments were not considered in the initial analysis as they address potential impacts that are outside the scope of the master planning process including requirements or standards around operational matters such as governance, maintenance and welfare.

Table 3-3 Relevant Commonwealth, Queensland and local government management measures

Commonwealth Government	Queensland Government	Local Government
Key management measures (current) relevant to new development at the Port and surrounding areas		
Environment Protection and Biodiversity Conservation Act 1999 *Great Barrier Reef Marine Park Act 1975* and the *Great Barrier Reef Marine Park Zoning Plan 2003* *Environment Protection (Sea Dumping) Act 1981*	*Environmental Protection Act 1994* *Planning Act 2016* and associated State Development Assessment Provisions *State Development and Public Works Organisation Act 1971* and the APSDA development scheme *Transport Infrastructure Act 1994* and the Port of Abbot Point LUP and NQBP Sustainable Port Development Guidelines	Whitsunday Regional Council Planning Scheme (July 2017) v3.7
Other management measures relevant to new development at the Port and surrounding areas		
Aboriginal and Torres Strait Islander Heritage Protection Act 1984 *Biosecurity Act 2015* *Coastal Trading (Revitalising Australian Shipping) Act 2012* *Marine Safety (Domestic Commercial Vessel) National Law Act 2012* *Native Title Act 1993* *Navigation Act 2012* *Protection of the Sea (Prevention of Pollution from Ships) Act 1983* *Sea Installations Act 1987* *Underwater Cultural Heritage Act 2018* *Work Health and Safety Act 2011* Reef 2050 Long-Term Sustainability Plan 2021–2025	*Aboriginal Cultural Heritage Act 2003* *Aboriginal Land Act 1991* *Biosecurity Act 2014* *Building Act 1975* *Coastal Protection and Management Act 1995* *Environmental Offsets Act 2014* *Fisheries Act 1994* *Forestry Act 1959* *Land Act 1994* *Marine Parks Act 2004* *Native Title (Queensland) Act 1993* *Nature Conservation Act 1992* *Queensland Heritage Act 1992* *Regional Planning Interests Act 2014* *Sustainable Ports Development Act 2015* *Transport Operations (Marine Pollution) Act 1995* *Transport Operations (Marine Safety) Act 1994* *Transport Operations (Marine Safety–Domestic Commercial Vessel National Law Application) Act 2016*	

Commonwealth Government	Queensland Government	Local Government
	Transport Operations (Road Use Management) Act 1995 *Vegetation Management Act 1999* *Water Act 2000* *Work Health and Safety Act 2011* Mackay, Isaac and Whitsunday Regional Plan 2012	

3.3.1 Key management measures

While each of the management measures is relevant within its remit for management of the impacts of development at the port and surrounding areas, the key measures identified in Table 3-3 that are currently relevant to the management of significant new development in the port area are discussed below.

3.3.1.1 Commonwealth Government

The EPBC Act is the principal environmental legislation in Australia. The EPBC Act provides a framework for the protection of environmental values of national and international significance through the regulation of activities that may impact on nine 'matters of national environmental significance' (MNES), including (among other things) listed threatened species and communities, listed migratory species, world and national heritage properties and the GBRMP.

The *Great Barrier Reef Marine Park Act 1975* (GBRMP Act) is the primary legislation providing for the protection and conservation of the environment, biodiversity and heritage values of the GBR region. Among other things, the GBRMP Act provides for the designation of the GBRMP and establishes a management framework establishing zoning plans and a system of permissions to regulate the use of the Marine Park, including for dredging and placement of dredge material.

The *Environment Protection (Sea Dumping) Act 1981* (Sea Dumping Act) regulates (among other things) dredging and disposal of dredge material at sea, noting that for dredging and disposal within the GBRMP the legislation is administered by the Great Barrier Reef Marine Park Authority.

3.3.1.2 Queensland Government

The Planning Act is the head of power for planning and development in Queensland. The Planning Act establishes the Queensland planning framework, which includes (among other things):

- The plan-making system, which guides strategic planning and sets out the planning intent for land across Queensland. The Planning Act brings into effect the State Planning Policy (SPP)
- The development assessment system, which sets out the rules for how development is to occur. Through the Planning Act the State Development Assessment Provisions (SDAP) provide assessment benchmarks for the assessment of development applications in Queensland.

The Planning Act works in concert with the SDAP and related legislation to manage potential impact to values as relevant to the development activity, including the *Coastal Protection and Management Act*

1995, EP Act, *Fisheries Act 1994*, *Queensland Heritage Act 1992*, *Vegetation Management Act 1999* and *Water Act 2000*.

The EP Act is a key element of Queensland's environmental regulatory system. The EP Act and its subordinate legislation prescribes a range of Environmentally Relevant Activities (ERAs), which are activities identified by the Government to present environmental risks and require assessment and issuance of an Environmental Authority before these activities can be undertaken. The ERAs include (among other things) activities commonly undertaken at ports such as dredging and mineral and bulk material handling. Further, the EP Act implements a range of environmental protection policies that support the purpose of the act in relation to specific environmental aspects including air, noise, and water and wetland biodiversity. For these matters, the environmental protection policies prescribe environmental values to be enhanced or protected, establish objectives for enhancing or protecting these values, and provide a framework for decision-making.

Among other things, the SDPWO Act establishes a framework for coordinating and planning the delivery of large-scale projects and provides a process for the declaration of State Development Areas (SDAs) such as the APSDA to promote economic development in Queensland. Following the declaration of an SDA the Queensland Government, through the Coordinator-General, assumes responsibility for undertaking land use planning and development assessment functions for land within the SDA through the preparation of a development scheme. A large-scale project may be declared a 'coordinated project' under the SDPWO Act, in which case it is subject to a coordinated assessment by the Coordinator-General and relevant government agencies through the preparation of an EIS or Impact Assessment Report (IAR).

The *Transport Infrastructure Act 1994* (TIA) establishes a regulatory framework that provides for integrated planning and the efficient management of Queensland's ports. It establishes port authorities and port limits along with port LUPs as the principal regulatory mechanism for planning and development on SPL. The TIA also determines that port authorities are the assessment manager for all assessable development under the Planning Act for SPL. Proposed new development on SPL at Abbot Point is assessed against the Port of Abbot Point LUP along with NQBP's Sustainable Port Development Guidelines.

3.3.1.3 Local Government

The WRC planning scheme is the principal local planning instrument used by Whitsunday Regional Council to regulate development within the local government area. The WRC planning scheme contains various components which work collectively to regulate planning and development including strategic framework, tables of assessment, zone codes, local plan codes, overlay codes, development codes, schedules and planning scheme policies. The WRC planning scheme does not apply to SPL or the APSDA.

3.3.2 Application of management measures

The EBR provides an overview of the application of all identified management measures, including in Chapter 4.4 (Management measures – overview, Tables 4.2, 4.3, 4.4), describing the values managed for each instrument along with the application of the instrument.

The key management measures applicable to proposed development activity at the Port of Abbot Point and surrounds (Table 3-3) are contingent on various factors including the geographic location of development, the scope of activity and/or the values potentially impacted by the development:

- Dependent on geographic location and activity, new port development will require approval of land use under:
  - The development scheme for the APSDA for development within the APSDA
  - The LUP and associated port development guidelines for development within SPL
  - The WRC planning scheme for development within the Whitsunday Regional Council area
  - The GBRMP Act for development within the marine park.
- Dependent on activity and/or values potentially impacted new port development will require:
  - Approval under the Planning Act, with consideration of associated legislation and SDAP
  - Environmental Authority under the EP Act
  - Approval under the EPBC Act
  - Approval under the Sea Dumping Act.
- Dependent on the significance of environmental effects and complexity of approval requirements (among other things) proposed port development activity may be categorised as a 'coordinated project' under the SDPWO Act, requiring impact assessment either by a comprehensive EIS or a targeted IAR.

By way of example, Table 3-4 shows the key management measures that would typically be applied to port-related development activities with the potential to result in impacts on environmental values within and surrounding the master planned area.

Table 3-4 Key management measures typically applied to port-related development activities

Port-related development activities identified by TMR	Key management measures
Capital dredging	Approval under the relevant local planning instrument i.e., LUP and associated port development guidelines and/or APSDA development scheme. Approval under the GBRMP Act for development within the marine park. Approval for activities such as coastal development, tidal works and removal or destruction of marine plants (approval under the Planning Act or under the *Coastal Protection and Management Act 1995* and *Fisheries Act 1994*). Environmental Authority under the EP Act for dredging. Approval under the EPBC Act for significant impacts on MNES.
New or expanded port and supply chain infrastructure	Approval under the relevant local planning instrument i.e., LUP and associated port development guidelines and/or APSDA development scheme. Approval for activities such as vegetation clearing, coastal development, tidal works and removal of marine plants (approval under the Planning Act or under the *Vegetation Management Act 1999*, *Coastal Protection and Management Act 1995* and *Fisheries Act 1994*). Approval under the EPBC Act for significant impacts on MNES.
Establishment of new port-related industries	Approval under the relevant local planning instrument i.e., LUP and associated port development guidelines and/or APSDA development scheme.

Port-related development activities identified by TMR	Key management measures
	Approval under the Planning Act for activities such as vegetation clearing, coastal development and tidal works and removal or destruction of marine plants. Environmental Authority under the EP Act for activities such as bulk material handling. Approval under the EPBC Act for significant impacts on MNES.

4 Risk assessment

4.1 Overview

The risk assessment applied the TMR Method. For each of the identified values, consideration was given to potential development activities and impacts, threats or pressures to those values. An assessment was undertaken of uncontrolled or 'initial risk' posed by the potential impacts to the values, followed by controlled or 'post-management risk' with matters for consideration identified.

A risk assessment table (refer to Appendix A) was used to capture the risk assessment, including the initial and post-management risk levels along with associated and supporting commentary. Commentary with respect to the post-management risk ratings was provided in the table as 'matters for consideration'. This includes further detail to explain the risk rating outcomes and rationale as to why/why not the matter may require further address during master plan and overlay preparation.

The risk assessment table addressed values identified in the EBR under the following groups:

- Marine values
- Land values
- Cultural heritage values
- Social values.

4.2 Risk assessment tools

The risk assessment approach followed the TMR Method for initial analysis. The risk assessment tools consisted of:

- A risk matrix (Table 4-1), noting that the target risk profile for TMR is 'Low' or a positive outcome for the value
- Likelihood and consequence definitions (Table 4-2 and Table 4-3 respectively), noting that as shown in Table 4-3, 'consequence' contemplates the presence or absence of important values at the port, along with the severity of potential impacts to values.

Table 4-1 TMR risk matrix

Consequence / Likelihood	Rare	Unlikely	Possible	Likely	Almost certain
Positive	Positive	Positive	Positive	Positive	Positive
Minor	Low	Low	Low	Low	Low
Moderate	Low	Medium	Medium	Medium	Medium
Major	Medium	Medium	High	High	High

Table 4-2 TMR likelihood definitions

Likelihood	Definition
Almost certain	Is expected to occur as a regular or unavoidable result of development
Likely	Will probably occur as a result of development within planning horizon of the master plan (2050)
Possible	Might occur as a result of development within planning horizon of the master plan
Unlikely	Unlikely to occur as a result of development within planning horizon of the master plan
Rare	Extremely unlikely to occur as a result of development within planning horizon of the master plan

Table 4-3 TMR consequence definitions

Definition	Environmental values	Social values	Cultural heritage values
Positive	Positive environmental outcomes	Positive social and community outcomes	Improved protection and opportunity to appreciate heritage values
Minor	Impact is present but not to the extent that it would impair the overall condition of the ecosystem, OUV, sensitive population or community in the long term	Disruption to social amenity or demand on services for 1-12 months	Minor or reversible disruption to access or appreciation of heritage values
Moderate	Impact is present at either a local level for a period of 0 - 10 years but would not affect local expression of a GBR OUV. If environmental values are high, recovery periods of 0 - 10 years anticipated	Impact to multiple community sectors or businesses for 1-5 years	Temporary loss of access to heritage values Loss of appreciation of heritage value
Major	Impact is significant at either a local or wider level or to a sensitive population or community Impacts of a temporary nature (0 – 10 years) to the local expression of a GBR OUV. OR If environmental values are high, recovery periods of greater than 10 years are likely	Prolonged negative impact to multiple community sectors or businesses with limited ability to adapt or recover (5 or more years) OR Permanent or long-term decline in social or community profile	Restricted access and/or reduction to condition or quality of heritage value and appreciation OR Permanent alteration or loss of heritage values

Definition	Environmental values	Social values	Cultural heritage values
	OR Condition of an affected part of the ecosystem/environmental value or local expression of a GBR OUV is irretrievably compromised		

The assessment of post management risk was supported by a rating of management measures application (Table 4-4) where management measures rated as '1*' provide greater confidence for application and therefore reduction of risk than management measures rated as '3*'.

Table 4-4 Application of relevant management measures

Rating	Application	Examples
1*	Values are identified and potential impacts from development are specifically managed through existing regulatory processes: • Values and potential impacts are transparently identified and addressed in assessment processes with rigorous and legally binding requirements applied to manage impacts.	This category includes legislation and land planning instruments with mandatory development controls targeting the protection of environmental values. Examples include: • EPBC Act: regulates impacts to specific environmental and cultural heritage matters listed under the Act (MNES) such as particular vegetation communities or migratory species • *Vegetation Management Act 1999*: protects Queensland native vegetation • WRC planning scheme: includes development controls targeting protection of values such as water quality, native vegetation and amenity.
2**	Values and potential impacts from development are generally managed through existing regulatory processes: • Values and potential impacts are generally identified and addressed in assessment processes with the potential for requirements to be applied to development or activities.	This category includes: • mandatory instruments (legislation, land planning instruments, policies with mandatory provisions) that either indirectly address impacts on a value or parts thereof (e.g., Sustainable Ports Act restricting capital dredging to priority ports, thereby indirectly limiting the magnitude of impacts from dredging) • instruments that require local planning schemes to integrate specific measures to regulate impacts on particular values (e.g., State Planning Policy).
3***	Values and potential impacts from development are somewhat managed through discretionary or non-regulatory processes: • Values and potential impacts are partially identified with assessment or management providing some guidance on implementation.	This category includes non-mandatory instruments such as policies. Examples include: Reef 2050 Long-Term Sustainability Plan and Mackay, Isaac and Whitsunday Regional Plan.

4.3 Values

For the purposes of the initial analysis, the following overarching values identified in the EBR were used in the risk assessment:

- Marine-based environmental values
  - Marine and estuarine water quality that supports aquatic ecosystems
  - Coastal processes such as bathymetry, tides, currents, waves and sediment transport
  - Marine plants including mangroves, saltmarsh, seagrass, macroalgae
  - Coral reefs including near-shore and mid-shelf reefs
  - Fish and Fish Habitat Areas
  - Marine reptiles, marine mammals and migratory marine species
- Land-based environmental values
  - Terrestrial vegetation communities and ecosystems
  - Listed threatened and migratory species and associated habitat
  - Surface water resources, including water quality that supports aquatic ecosystems
  - Groundwater resources that support aquatic ecosystems
  - Wetlands such as the Caley Valley Wetland and associated ecosystems
- Cultural heritage
  - Indigenous cultural heritage
  - Historical heritage
- Social values associated with health and amenity of surrounding communities including air and noise environment along with visual amenity and road safety
- Social values associated with health and safety of surrounding communities and as relevant to industrial safety.

The contribution of attributes to the OUV of the GBRWHA (Table 4-5) was flagged in the risk assessment table for each environmental value (as relevant) and was considered in the risk assessment for the initial analysis (refer to Section 4.2).

Table 4-5 Local attributes of the Outstanding Universal Value of the Great Barrier Reef World Heritage Area

Category	Local attribute	Relevant OUV criteria and contribution classifications				Summary of the key environmental values
		vii	viii	ix	x	
Corals	Coral reefs (400 species of corals in 60 genera)				Min	Coral reefs exist within the Abbot Point region and consist of near-shore and mid-shelf reefs. Reef communities comprising hard and soft corals exist at Camp Reef, Middle Island Reef, Holbourne Island, Stone Reef, North Head Reef and Thomas Reef. Coral diversity at Camp Island and Holbourne Island is dominated by fast growing species including *Acropora* and *Montipora*. The inshore reefs of the region are relatively small and limited in extent in comparison to other inshore reefs. They have relatively low diversity and low cover. They have persisted over time with fluctuations driven mainly by cyclonic disturbances. As the reefs are relatively isolated from other systems they tend to be regenerative. The size and density of inshore reefs does not result in the mass spawning events more commonly associated with mid shelf and outer reefs. Local spawning is important for ongoing presence of the reefs, but it is not on a level of the mass phenomenon that if of importance for reef persistence across the wider world heritage area.
	Coral reef ecosystem		Min			
	Inshore fringing reefs, mid-shelf reefs, and exposed outer reefs		Min			
	Hard and soft corals	Min				
	Coral reefs, sand banks and coral cays			Min		
	Coral spawning	Min				
Mangroves	Diversity of mangroves				Mod	The Caley Valley Wetland contains approximately 673 hectares of mangrove forests in the western estuarine zone where mangroves are associated with three tidal channels flowing in Curlewis Bay and Saltwater Creek. To the south, mangroves are associated with the tidal channels of Euri Creek and Menilden Creek. Milky Mangrove (*Excoecaria agallocha*) is the dominant mangrove species in the Saltwater Creek area, while the Red Mangrove (*Rhizophora stylosa*) and Yellow Mangrove (*Ceriops tagal*) dominate in the western estuarine zone of Caley Valley Wetlands There are small areas of mangroves present on Cape Upstart Island, North Head Island and Stone Island.
	Vast mangrove forests	Mod				

Category	Local attribute	Relevant OUV criteria and contribution classifications				Summary of the key environmental values
		vii	viii	ix	x	
Seagrass and macroalgae	Beds of *Halimeda* algae			Min		Three species of *Halimeda* have been recorded within areas of low mud content substrate. The algae coverage at inshore fringing reefs in the study area fluctuates seasonally. Camp Island monitoring sites were dominated by *Sargassum* and Holbourne Island was dominated by *Padina.* Seagrass and macroalgae occurs in the inshore and offshore areas, the cover of which fluctuates seasonally. Seagrass presence is typical of other inshore areas throughout the region.
	Diversity of seagrass				Min	
Marine turtles	Marine turtles				Min	Species of marine turtle include: Loggerhead turtle, Green turtle, Leatherback turtle, Hawksbill turtle, Olive-ridley turtle and Flatback turtle. There are low levels of nesting by Green turtles within port limits, with foraging and breeding areas at Edgecumbe Bay. There are small populations residing inside and adjacent to the mouths of Saltwater Creek and Euri Creek. While all breeding is important the contribution to population recruitment in comparison to other breeding areas is low.
	Green turtle breeding	Min			Min	
	Nesting turtles	Min				
Marine mammals	Migrating whales	Min				Humpback whale adults and calves have been recorded within the coastal waters of Abbot Point, potentially using the area for resting on their southern migration from calving grounds. No aggregations areas are known to exist in the vicinity of the port. This area is of low conservation importance for Dugongs. Dugongs may forage in the seagrass beds as they move between the Dugong Protection Areas located to the north at Upstart Bay (44 kilometres north-west of Abbot Point) and 'Dugong Sanctuary at Edgecumbe Bay (35 kilometres south-east of Abbot Point). The Indo-Pacific humpback dolphin and the Australian snubfin dolphin have been recorded during surveys of the Abbot Point marine area. The Abbot Point area provides suitable habitat for these species which prefer shallow (<20 metres deep) coastal waters. In addition, the creek mouths and seagrass beds provide suitable preferred habitat for the snubfin dolphin.
	Species of whales				Min	
	Dugong				Min	
	Species of dolphins				Min	

Category	Local attribute	Relevant OUV criteria and contribution classifications				Summary of the key environmental values
		vii	viii	ix	x	
Landscapes and Seascapes	Green vegetated islands	Min				There are six islands present within or adjacent to the study site. Holbourne Island vegetation includes over 90 species of plants and four regional ecosystems including *Pisonia grandis*, *Xanthorrhoea latifolia* subsp. *latifolia* shrubland and *Timonius timon* shrubland. Pandanus and coastal she oaks are present as a small aggregate on a fore dune on the southern headland. The other islands with a lessor coverage and diversity of vegetation and include: Camp Island, Gloucester Island, Stone Island, Middle Island and North Head Island. A variety of seascapes and landscapes exist in the study area and surrounds including Mount Roundback, Mount Little, Mount Luce, wetlands, mangroves, sand beaches, mudflats, open water, coastal islands and coral reefs.
	Vegetation of the cays and continental islands			Min		
	Vegetated mountains	Min				
	Unique and varied seascapes and landscapes		Min			
	Significant diversity of reef and island morphologies that reflects ongoing geomorphic, oceanographic and environmental processes			Min		
	Superlative natural beauty	Mod				Large aggregations of shorebirds, seabirds and migratory birds at the Caley Valley Wetlands. Ocean and island vistas.
Species diversity	Over 4000 species of molluscs and over 1500 species of fish, plus a great diversity of sponges, anemones, marine worms, crustaceans			Min		Marine fish are present in Fish Habitat Protection Areas located adjacent to the project site and the seagrass and reef habitats within the project site. There are a small number of mid-shelf and inshore reefs within the study area and surrounds which support reef fish communities. Low density benthic macroinvertebrates populations in deepwater areas at Abbot Point. Diversity is high and typical of deepwater communities found elsewhere in the region. Reef communities in the area are not extensive or unique. Associated reef fish communities reflect the limited reef communities. It has been estimated that in this region there are approximately 132 species of reef fish from 51 families.
	Thousands of species of reef fish	Min				

Category	Local attribute	Relevant OUV criteria and contribution classifications				Summary of the key environmental values
		vii	viii	ix	x	
	Diversity supporting marine and terrestrial species (global conservation significance)				Sig	The Caley Valley Wetland is a nationally important wetland which provide habitat for large numbers of seabirds and shorebirds including threatened and migratory species. It supports a significant population of waterbirds with over 40,000 birds and 154 bird species recorded. This wetland while not in the GBRWHA, provides connectivity between the wetland and the World Heritage Area. Holbourne Island also provides bird nesting habitat. Species present include the red knot, curlew sandpiper, great knot, great sand plover, lesser sand plover, bar-tailed godwit, Australian painted snipe, red-necked Stint, Sharp-tailed Sandpiper, Latham's Snipe and Great Egret Caspian Tern.
	Plant species and endemism (species being unique to a defined geographic location)				Min	One Threatened Ecological Community, the Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions are recorded. Listed flora species include *Ristida granitica*, *Dicanthium setosum*, *Eucalyptus raveretiana, Omphalea celata* and *Ozothamnus eriocephalus*.
	Important role of birds, such as the pied imperial pigeon, in processes such as seed dispersal and plant colonisation			Min		The seed dispersal role played by birds is important in terrestrial environments and particularly to help maintain biological and genetic diversity between vegetated islands and the mainland. The Imperial pigeon for instance migrates daily as flocks from the islands to the mainland rainforests to eat fruit, returning to the islands at dusk. These environments are limited and sparse in the Abbot Point area and as such the ecological role of birds in spreading seeds is minor.
	Breeding colonies of seabirds and marine turtles	Sig				Nineteen listed bird species (EPBC Act) are known to or likely to occur in the study area. Seven species had habitat or roosting areas within the study area including the red knot, curlew sandpiper, great knot, great sand plover, lesser sand plover, bar-tailed godwit and Australian painted snipe.
	242 species of birds				Sig	

Category	Local attribute	Relevant OUV criteria and contribution classifications				Summary of the key environmental values
		vii	viii	ix	x	
	22 seabirds species breeding				Sig	The Caley Valley Wetlands is an important habitat for listed birds and overall species diversity. It has a significant number of shorebirds and suitable migratory shorebird habitat. There are six migratory bird species that have large populations in the wetland including the Red-necked Stint, Sharp-tailed Sandpiper, Latham's Snipe, Great Egret Caspian Tern and the endangered Australian Painted Snipe
Coastal processes	Cross-shelf, longshore and vertical connectivity			Min		Offshore areas form part of the larger longshore connections within the Great Barrier Reef lagoon.

4.4 Potential impacts

For the purposes of the initial analysis, the following potential impacts of development activities to values were identified in the EBR and used in the risk assessment:

- Potential impacts to marine and estuarine water quality:
  - Maintenance and/or capital dredging causing increased sedimentation and turbidity
  - Stormwater runoff from development areas, including vegetation clearing, earthworks and operational activities causing elevated loads of sediment, nutrients and contaminants
  - Elevated sediment, nutrient and contaminant loads through construction and operational activities including reclamation, wastewater discharge and dust emissions
  - Disturbance of ASS during construction and operational activities
  - Increased intensity of storm events and storm surge due to climate change causing elevated loads of sediment, nutrients and contaminants.
- Potential impacts to coastal processes:
  - Alteration of topography and hydrology through development of port infrastructure and removal or placement of material in the marine environment (such as through reclamation, dredging and dredge material placement) causing changes to currents, waves and sediment transport
  - Increased vulnerability of coastal areas to climate change-induced sea level rise and associated changes to coastal processes.
- Potential impacts to marine plants:
  - Vegetation clearing resulting in direct loss of marine plants and reduction of habitat quality in remaining areas due to edge effects (including through increased availability of access) that reduce extent, condition and quality of mangrove and intertidal flora communities

  - Development of port infrastructure and removal or placement of material in the marine environment (such as through reclamation, dredging and dredge material placement) resulting in direct loss of marine plants and associated habitat and reduction of habitat quality in adjacent areas due to altered coastal processes and including erosion and accretion of sediments
  - Elevated sediment, nutrient and contaminant loads in water due to stormwater runoff and emissions and discharges from construction and operational activities (including reclamation and dredging) causing a decline in quality or loss of marine plant habitat
  - Elevation of sea surface temperature due to climate change resulting in degradation or loss of marine plant habitat.
  - Sea level rise caused by climate change resulting in the degradation or loss of marine plant habitat in intertidal areas (additional to those identified in the EBR).
- Potential impacts to coral reefs:
  - Development of port infrastructure and removal or placement of material in the marine environment (such as through reclamation, dredging and dredge material placement) resulting in direct loss of coral reefs and coral habitat, and reduction of habitat quality in adjacent areas due to altered coastal processes and including altered sediment transport
  - Elevated sediment, nutrient and contaminant loads in water due to stormwater runoff and emissions/discharges from construction and operational activities (including reclamation and dredging) causing a decline in quality or loss of coral reef and coral habitat
  - Elevation of sea surface temperature and increasing ocean acidification due to climate change resulting in degradation or loss of coral reef and coral habitat.
- Potential impacts to fish and Fish Habitat Areas:
  - Development of port infrastructure and removal or placement of material in the marine environment (such as through reclamation, dredging and dredge material placement) resulting in mortality or injury of fish, direct loss of fish habitat and reduction of habitat quality in adjacent areas due to altered coastal processes, including erosion and accretion of sediments
  - Elevated sediment, nutrient and contaminant loads in water due to stormwater runoff and emissions/discharges from construction and operational activities (including reclamation and dredging) causing a decline in quality or loss of fish habitat, including breeding and feeding habitat
  - Onshore development activities within and across watercourses, including for linear infrastructure, resulting in direct loss of habitat and obstruction or diminishment of fish passage.
- Potential impacts to marine reptiles, marine mammals and marine migratory species:
  - Development of port infrastructure and removal or placement of material in the marine environment (such as through reclamation, dredging and dredge material placement) resulting in mortality or injury of fauna (such as through vessel strike), direct loss of habitat, and reduction of habitat quality in adjacent areas due to altered coastal processes including altered sediment transport
  - Elevated sediment, nutrient and contaminant loads in water due to stormwater runoff and emissions/discharges from construction and operational activities (including reclamation and dredging) causing a decline in quality or loss of habitat

  - Elevated levels of noise, vibration and lighting associated with construction and operational activities resulting in a reduction of habitat quality affecting fauna behaviour (such as migratory routes, breeding and feeding activity) and leading to elevated stress or mortality.
- Potential impacts to terrestrial vegetation communities and ecosystems:
  - Vegetation clearing resulting in direct loss of vegetation communities and ecosystems and reduction of habitat quality in remaining areas due to edge effects (including through increased availability of access) that reduce extent, condition and quality of communities and ecosystems
  - Elevated sediment, nutrient and contaminant loads in water due to stormwater runoff and emissions/discharges from construction and operational activities (including onshore dredge material placement) causing a decline in quality or loss of habitat
  - Modification to surface water and groundwater resources (including altered flow paths and water availability) due to construction and operational activities such as earthworks causing a decline in quality or loss of habitat
  - Increased weed and pest pressure on terrestrial vegetation communities and ecosystems due to construction and operational activities, including through increased availability of access.
- Potential impacts to listed threatened and migratory species:
  - Vegetation clearing resulting in direct loss of threatened and migratory species and/or their habitat along with reduction of habitat quality in remaining areas due to edge effects (including through increased availability of access) that reduce extent, condition and quality of habitat
  - Elevated sediment, nutrient and contaminant loads in water due to stormwater runoff and emissions/discharges from construction and operational activities (including onshore dredge material placement) causing a decline in quality or loss of habitat for listed threatened and migratory species
  - Modification to surface water and groundwater resources (including altered flow paths and water availability) due to construction and operational activities such as earthworks causing a decline in quality or loss of habitat for listed threatened and migratory species
  - Injury or mortality of listed threatened and migratory species due to direct interaction with construction and operational activities (such as vehicle strike)
  - Elevated levels of air, noise, vibration and lighting emissions associated with construction and operational activities resulting in a reduction of habitat quality, affecting species habitat and fauna behaviour (such as migratory routes, breeding and feeding activity) and leading to elevated stress or mortality
  - Increased weed and pest pressure on habitat for listed threatened and migratory species due to construction and operational activities, including through increased availability of access.
- Potential impacts to surface water resources:
  - Stormwater runoff from development areas, including vegetation clearing, earthworks and operational activities causing elevated loads of sediment, nutrients and contaminants
  - Elevated sediment, nutrient and contaminant loads through construction and operational activities including onshore dredge material placement, wastewater discharge and dust emissions
  - Disturbance of ASS during construction and operational activities

  - Modification to surface water resources (including altered flow paths and water availability) due to construction and operational activities such as earthworks.
- Potential impacts to groundwater:
  - Altered groundwater availability and connectivity with surface water resources, along with diminished groundwater quality due to construction and operational activities including earthworks and groundwater extraction.
- Potential impacts to wetlands:
  - Direct loss of wetlands due to construction and operational activities within the wetland (including earthworks) and reduction of wetland habitat quality in remaining areas due to edge effects (including through increased availability of access) that reduce extent, condition and quality of communities and ecosystems
  - Elevated sediment, nutrient and contaminant loads in water due to stormwater runoff and emissions/discharges from construction and operational activities (including onshore dredge material placement) causing a decline in quality or loss of wetland habitat
  - Modification to surface water and groundwater resources (including altered flow paths and water availability) due to construction and operational activities such as earthworks causing a decline in quality or loss of wetland habitat
  - Elevated levels of air, noise, vibration and lighting emissions associated with construction and operational activities resulting in a reduction of wetland habitat quality, affecting wetland species habitat and the behaviour of species reliant on the wetland (such as migratory, breeding and feeding activity), and leading to elevated stress or mortality in those wetland species
  - Increased weed and pest pressure on wetland ecosystems due to construction and operational activities, including through increased availability of access.
- Potential impacts to Indigenous cultural heritage:
  - Direct loss or degradation of cultural heritage sites during land or marine area disturbance for construction and operational activities and through increased availability of access to cultural heritage sites.
- Potential impacts to historical heritage:
  - Direct loss or degradation of historical heritage sites during land or marine area disturbance for construction and operational activities and through increased availability of access to historical heritage sites.
- Potential impacts to social values associated with amenity of surrounding communities:
  - Increased road traffic and associated road safety management issues due to construction and operational activities, including traffic associated with commuting workers, delivery of construction materials, plant and equipment and increased heavy vehicle activities
  - Elevated levels of air, noise, vibration and lighting emissions along with altered visual aspect of port land and surrounding areas due to construction and operational activities causing reduced amenity of surrounding communities.
- Potential impacts to social values associated with industrial safety:
  - Industrial incident causing harm or health impacts to surrounding communities.

4.5 Initial risk

The initial risk assessed the likelihood of each development type (i.e., Special, Medium/High, Low Impact development[1]) to cause the listed potential impacts, threats or pressures[2] and the consequence level on the environmental value[3] considered.

The assessment of initial risk assumed that there are no management measures (legislative and planning instruments) in place to control potential impacts, threats or pressures associated with development activities. This is the reason why some risks were ranked 'high', particularly for the Special Development category.

The risk scoring took into consideration any port-specific features (environmental or other). For instance, the presence of the Caley Valley Wetlands in very close proximity to active port areas at Abbot Point leads the initial risk to be high for both Special Development and High/Medium impact Development.

4.6 Post-management risk

The assessment of post-management risk considered the existing management measures (legislative and planning instruments) that would be applied to prevent or mitigate the potential impact, thereby managing and reducing the risk. Consideration was given to Commonwealth, Queensland and local government regulatory and planning instruments.

The post-management risk assessment was primarily focussed on the application of regulatory and planning instruments to the listed potential impacts, their capacity to regulate them and reduce the initial risk level. It should be noted that the risk assessment considered whether regulatory and planning instruments apply to the listed threats. It did not assess the way the management measures are implemented/administered by regulators.

Acknowledging that regulatory and planning instruments work together in a framework to regulate development, multiple instruments may apply to each potential impact, depending on the type of impact, type of development and location of the development. This combined application of instruments is illustrated in Figure 4-1.

[1] Refer to Section 3.2 for a description of each development type.
[2] Potential impacts, threats or pressures were sourced from the EBR and are discussed in Section 4.4.
[3] Refer to Section 4.3 for a description of the values sourced from the EBR.

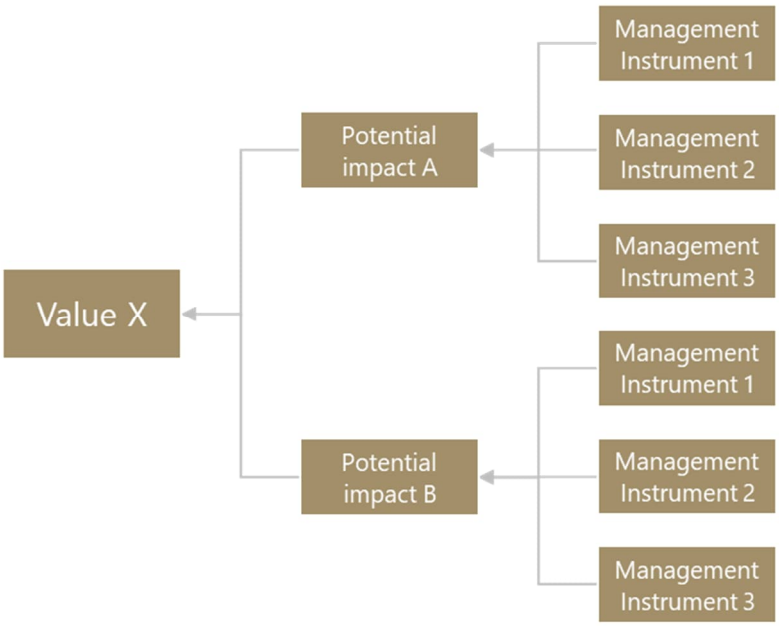

Figure 4-1 Combined application of regulatory and planning instrument to potential impacts on a value

The post-management risk assessment considered two aspects for each impact:

1. Firstly, the application of each of the individual instruments, i.e., the application of the individual instrument to regulating the potential impact, or part thereof, within the instrument's stated purpose
2. Secondly, the combined application of all instruments relevant to the identified potential impact.

As such, the post-management risk assessment identified if a potential impact is not, or is incompletely, addressed by the combined application of all instruments relevant to that potential impact.

4.6.1 Application of each regulatory and planning instrument

The rating of each regulatory and planning instrument (as per Table 4-4) was used in the risk assessment to alter the consequence and/or likelihood of the post-management risk. Table 4-6 describes how the rating of each instrument typically influenced the post-management risk rating.

Table 4-6 Effect of regulatory and planning instrument rating on post-management risk rating

1*/2**/3*** instrument rating	Effect of application of regulatory/planning instrument on risk rating
1*	With reference to the Initial Risk rating, Consequence rating was typically reduced to Minor. Likelihood rating may have been reduced subject to risk description and instrument.
2**	With reference to the Initial Risk rating, Consequence rating may have been reduced by one category (e.g., Major to Moderate or Moderate to Minor) pending risk description and instrument. Likelihood rating may have been reduced subject to risk description and instrument.
3***	With reference to the Initial Risk rating, Consequence may have been reduced by one category (e.g., Major to Moderate or Moderate to Minor) subject to risk description and instrument.

4.6.2 Combined application of all regulatory and planning instruments

The 'combined risk' is a rating of the combined application of all regulatory and planning instruments that address one or more threats listed for a given value. The combined post-management risk reflected the combined application of existing management measures in managing potential impacts of development on each value e.g., the presence of Commonwealth and Queensland Government regulatory and planning instruments combined with local government planning controls may be sufficient to reduce the post-management risk to low.

4.7 Matters for consideration

The description of matters for consideration summarised how the regulatory/planning instrument(s) apply to one or multiple threats listed for a particular environmental value.

The initial analysis identified potential impacts that may not be managed to be of low risk through application of existing management measures. The risk assessment table included a description of why a matter should or should not be further considered, for example, in relation to the interaction of instruments, locational differences, level of assessment, land use intent or local expression of OUV.

5 Findings

This section presents the findings of the initial analysis. It is important to note that the initial analysis is not intended to provide recommendations regarding how identified gaps should be addressed in the master plan and/or port overlay.

5.1 Summary risk assessment table

Table 5-1 presents a summary of the key outcomes of the risk assessment with full copy of the risk assessment attached at Appendix A. Table 5-1 also explains the rating of the post-management risk for each potential impact.

In Table 5-1 and in the risk assessment tables in Appendix A:

- The column on 'potential impacts, threats or pressures' describes the types of impacts that could affect each value, as identified in the EBR
- The risks levels are defined as follows:
  - Initial risk: risk level if none of the current management measures existed (refer to "Initial risk" tables in Appendix A)
  - Post-management risk: risk level when applying current management measures (i.e., excluding the master plan and port overlay) (refer to "Post-management risk" tables in Appendix A)
- The column on 'findings' provides the justification for the post-management risk ranking for each potential impact.

Values of key importance at the Port of Abbot Point are those listed in Section 3.1.2. The risks to these values included in Table 5-1 are therefore of particular importance at Abbot Point.

Table 5-1 Summary risk assessment table

Potential impacts, threats or pressures	Initial risk *(Based on worst-case risk level)*	Post-management risk	Findings
Marine			
1. Marine and estuarine water quality			
Maintenance and/or capital dredging causing increased sedimentation and turbidity. Stormwater runoff from development areas, including vegetation clearing, earthworks and operational activities causing elevated loads of sediment, nutrients and contaminants.	Medium	Low	The combined application of Commonwealth, State, local government and port-specific instruments to these potential impacts/threats/pressures from new development is comprehensive.
Elevated sediment, nutrient and contaminant loads through construction and operational activities including reclamation, wastewater discharge and dust emissions.	Medium	Low	
Disturbance of ASS during construction and operational activities.	Medium	Low	
Increased intensity of storm events and storm surge due to climate change causing elevated loads of sediment, nutrients and contaminants.	Medium	Medium	The increase in intensity of storm surge and heavy rainfall events caused by climate change and threatening the health and quality of coastal waters is not addressed in any instrument considered in the initial analysis. Both initial and post-management risks are medium due to the current water quality within the Abbot Point study area being already affected by elevated loads of sediment, nutrients and contaminants.
2. Coastal processes			
Alteration of topography and hydrology through development of port infrastructure and removal or placement of material in the marine environment (such as through reclamation, dredging and dredge material placement) causing changes to currents, waves and sediment transport.	High	Low	The combined application of Commonwealth, State, local government and port-specific instruments to these potential impacts/threats/pressures from new development is comprehensive.

Potential impacts, threats or pressures	Initial risk *(Based on worst-case risk level)*	Post-management risk	Findings
Increased vulnerability of coastal areas to climate change-induced sea level rise and associated changes to coastal processes.	High	Medium	While some existing regulatory measures (e.g. coastal management district, erosion prone areas) will assist in indirectly mitigating impacts to coastal areas from sea level rise, no instrument considered in the initial analysis addresses climate change as the root cause.
3. Marine plants			
Vegetation clearing resulting in direct loss of marine plants and reduction of habitat quality in remaining areas due to edge effects (including through increased availability of access) that reduce extent, condition and quality of mangrove and intertidal flora communities.	High	Low	The combined application of Commonwealth, State, local government and port-specific instruments to these potential impacts/threats/pressures from new development is comprehensive.
Development of port infrastructure and removal or placement of material in the marine environment (such as through reclamation, dredging and dredge material placement) resulting in direct loss of marine plants and associated habitat and reduction of habitat quality in adjacent areas due to altered coastal processes and including erosion and accretion of sediments.	High	Low	
Elevated sediment, nutrient and contaminant loads in water due to stormwater runoff and emissions and discharges from construction and operational activities (including reclamation and dredging) causing a decline in quality or loss of marine plant habitat.	High	Low	
Elevation of sea surface temperature due to climate change resulting in degradation or loss of seagrass habitat.	Medium	Medium	The threat of rising sea surface temperature above tolerance thresholds of seagrass resulting in impacts to seagrass is not addressed in any instrument considered in the initial analysis. Both initial and post-management risks are medium due to the relatively low density and quality of seagrass populations within the Abbot Point study area.
Sea level rise caused by climate change resulting in the degradation or loss of marine plant habitat in intertidal areas.	High	High	The threat of sea level rise caused by climate change on intertidal areas is not addressed in any regulatory instrument considered in the initial analysis. The initial risk is high due to the important

Potential impacts, threats or pressures	Initial risk *(Based on worst-case risk level)*	Post-management risk	Findings
			amount of mangrove areas within the Abbot Point study area that have important value for fisheries, coastal water quality and coastal protection. The post-management risk remains high due to the absence of regulatory instrument addressing climate change as the root cause of sea level rise and absence of mitigation measures in existing regulatory instruments against sea level rise impacts on intertidal fauna and flora habitat.
4. Coral reefs			
Development of port infrastructure and removal or placement of material in the marine environment (such as through reclamation, dredging and dredge material placement) resulting in direct loss of coral reefs and coral habitat, and reduction of habitat quality in adjacent areas due to altered coastal processes and including altered sediment transport.	Medium	Low	The combined application of Commonwealth, State, local government and port-specific instruments to these potential impacts/threats/pressures from new development is comprehensive.
Elevated sediment, nutrient and contaminant loads in water due to stormwater runoff and emissions/discharges from construction and operational activities (including reclamation and dredging) causing a decline in quality or loss of coral reef and coral habitat.	Medium	Low	
Elevation of sea surface temperature and increasing ocean acidification due to climate change resulting in degradation or loss of coral reef and coral habitat.	Medium	Medium	The threats of increased ocean acidification from anthropogenic CO_2 emissions and increased water temperatures causing impacts to coral such as bleaching are not addressed under any instrument considered in the initial analysis. Both initial and post-management risks are medium due to the low quantity and relatively low importance of coral reefs within the Abbot Point study area.
5. Fish and Fish Habitat Areas			
Development of port infrastructure and removal or placement of material in the marine environment (such as through reclamation, dredging and dredge material placement) resulting in mortality or injury of fish, direct loss of fish habitat and	Medium	Low	The combined application of Commonwealth, State, local government and port-specific instruments to these potential

Potential impacts, threats or pressures	Initial risk *(Based on worst-case risk level)*	Post-management risk	Findings
reduction of habitat quality in adjacent areas due to altered coastal processes, including erosion and accretion of sediments.			impacts/threats/pressures from new development is comprehensive.
Elevated sediment, nutrient and contaminant loads in water due to stormwater runoff and emissions/discharges from construction and operational activities (including reclamation and dredging) causing a decline in quality or loss of fish habitat, including breeding and feeding habitat.	Medium	Low	
Onshore development activities within and across watercourses, including for linear infrastructure, resulting in direct loss of habitat and obstruction or diminishment of fish passage.	Medium	Low	
6. Marine reptiles, marine mammals and marine migratory species			
Development of port infrastructure and removal or placement of material in the marine environment (such as through reclamation, dredging and dredge material placement) resulting in mortality or injury of fauna (such as through vessel strike), direct loss of habitat, and reduction of habitat quality in adjacent areas due to altered coastal processes including altered sediment transport.	Medium	Low	The combined application of Commonwealth, State, local government and port-specific instruments to these potential impacts/threats/pressures from new development is comprehensive.
Elevated sediment, nutrient and contaminant loads in water due to stormwater runoff and emissions/discharges from construction and operational activities (including reclamation and dredging) causing a decline in quality or loss of habitat.	Medium	Low	
Elevated levels of noise, vibration and lighting associated with construction and operational activities resulting in a reduction of habitat quality affecting fauna behaviour (such as migratory routes, breeding and feeding activity) and leading to elevated stress or mortality.	Medium	Low	

Potential impacts, threats or pressures	Initial risk *(Based on worst-case risk level)*	Post-management risk	Findings
Land			
7. Terrestrial vegetation communities and ecosystems			
Vegetation clearing resulting in direct loss of vegetation communities and ecosystems and reduction of habitat quality in remaining areas due to edge effects (including through increased availability of access) that reduce extent, condition and quality of communities and ecosystems.	High	Low	The combined application of Commonwealth, State, local government and port-specific instruments to these potential impacts/threats/pressures from new development is comprehensive.
Elevated sediment, nutrient and contaminant loads in water due to stormwater runoff and emissions/discharges from construction and operational activities (including onshore dredge material placement) causing a decline in quality or loss of habitat.	High	Low	
Modification to surface water and groundwater resources (including altered flow paths and water availability) due to construction and operational activities such as earthworks causing a decline in quality or loss of habitat.	High	Low	
Increased weed and pest pressure on terrestrial vegetation communities and ecosystems due to construction and operational activities, including through increased availability of access.	High	Low	
8. Listed threatened and migratory species			
Vegetation clearing resulting in direct loss of threatened and migratory species and/or their habitat along with reduction of habitat quality in remaining areas due to edge effects (including through increased availability of access) that reduce extent, condition and quality of habitat.	High	Low	The combined application of Commonwealth, State, local government and port-specific instruments to these potential impacts/threats/pressures from new development is comprehensive.
Elevated sediment, nutrient and contaminant loads in water due to stormwater runoff and emissions/discharges from construction and operational activities (including onshore dredge material placement) causing a decline in quality or loss of habitat for listed threatened and migratory species.	High	Low	

Potential impacts, threats or pressures	Initial risk *(Based on worst-case risk level)*	Post-management risk	Findings
Modification to surface water and groundwater resources (including altered flow paths and water availability) due to construction and operational activities such as earthworks causing a decline in quality or loss of habitat for listed threatened and migratory species.	High	Low	
Injury or mortality of listed threatened and migratory species due to direct interaction with construction and operational activities (such as vehicle strike).	High	Low	
Elevated levels of air, noise, vibration and lighting emissions associated with construction and operational activities resulting in a reduction of habitat quality, affecting species habitat and fauna behaviour (such as migratory routes, breeding and feeding activity) and leading to elevated stress or mortality.	High	Low	
Increased weed and pest pressure on habitat for listed threatened and migratory species due to construction and operational activities, including through increased availability of access.	High	Low	
9. Surface water resources			
Stormwater runoff from development areas, including vegetation clearing, earthworks and operational activities causing elevated loads of sediment, nutrients and contaminants.	High	Low	The combined application of Commonwealth, State, local government and port-specific instruments to these potential impacts/threats/pressures from new development is comprehensive.
Elevated sediment, nutrient and contaminant loads through construction and operational activities including onshore dredge material placement, wastewater discharge and dust emissions.	High	Low	
Disturbance of ASS during construction and operational activities.	High	Low	
Modification to surface water resources (including altered flow paths and water availability) due to construction and operational activities such as earthworks.	High	Low	

Potential impacts, threats or pressures	Initial risk *(Based on worst-case risk level)*	Post-management risk	Findings
10. Groundwater			
Altered groundwater availability and connectivity with surface water resources, along with diminished groundwater quality due to construction and operational activities including earthworks and groundwater extraction.	Medium	Low	The combined application of Commonwealth, State, local government and port-specific instruments to these potential impacts/threats/pressures from new development is comprehensive.
11. Wetlands			
Direct loss of wetlands due to construction and operational activities within the wetland (including earthworks) and reduction of wetland habitat quality in remaining areas due to edge effects (including through increased availability of access) that reduce extent, condition and quality of communities and ecosystems.	High	Low	The combined application of Commonwealth, State, local government and port-specific instruments to these potential impacts/threats/pressures from new development is comprehensive.
Elevated sediment, nutrient and contaminant loads in water due to stormwater runoff and emissions/discharges from construction and operational activities (including onshore dredge material placement) causing a decline in quality or loss of wetland habitat.	High	Low	
Modification to surface water and groundwater resources (including altered flow paths and water availability) due to construction and operational activities such as earthworks causing a decline in quality or loss of wetland habitat.	High	Low	
Elevated levels of air, noise, vibration and lighting emissions associated with construction and operational activities resulting in a reduction of wetland habitat quality, affecting wetland species habitat and the behaviour of species reliant on the wetland (such as migratory, breeding and feeding activity), and leading to elevated stress or mortality in those wetland species.	High	Low	
Increased weed and pest pressure on wetland ecosystems due to construction and operational activities, including through increased availability of access.	High	Low	

Potential impacts, threats or pressures	Initial risk *(Based on worst-case risk level)*	Post-management risk	Findings
Cultural heritage			
12. Indigenous cultural heritage			
Direct loss or degradation of cultural heritage sites during land or marine area disturbance for construction and operational activities and through increased availability of access to cultural heritage sites.	High	Low	The combined application of Commonwealth, State, local government and port-specific instruments to these potential impacts/threats/pressures from new development is comprehensive.
13. Historical heritage			
Direct loss or degradation of historical heritage sites during land or marine area disturbance for construction and operational activities and through increased availability of access to historical heritage sites.	Low	Low	The combined application of Commonwealth, State, local government and port-specific instruments to these potential impacts/threats/pressures from new development is comprehensive.
Social			
14. Amenity of surrounding communities			
Increased road traffic and associated road safety management issues due to construction and operational activities, including traffic associated with commuting workers, delivery of construction materials, plant and equipment and increased heavy vehicle activities.	High	Low	The combined application of Commonwealth, State, local government and port-specific instruments to these potential impacts/threats/pressures from new development is comprehensive. The WRC planning scheme addresses reverse amenity in the rural zone in only limited cases, which leaves the possibility for new dwellings to be approved near the APSDA boundary and suffer amenity issues in future from new port-related industrial development. However, this risk remains 'low' because it is mitigated by: • the existence of precincts within the APSDA development scheme acting as buffer zones between more intensive industrial precincts and neighbouring lots (i.e., Restricted
Elevated levels of air, noise, vibration and lighting emissions along with altered visual aspect of port land and surrounding areas due to construction and operational activities causing reduced amenity of surrounding communities.	High	Low	

Potential impacts, threats or pressures	Initial risk *(Based on worst-case risk level)*	Post-management risk	Findings
			Development and Environmental Management/Material Transportation) • the rural zoning by the WRC planning scheme of the land surrounding the APSDA, which is associated with very low-density residential development.
15. Industrial safety			
Industrial incident causing harm or health impacts to surrounding communities.	High	Low	The combined application of Commonwealth, State, local government and port-specific instruments to these potential impacts/threats/pressures from new development is comprehensive.

5.2 Overall findings

The Commonwealth, State, local government and port instruments regulate potential impacts from proposed development within their respective remit. They also complement each other to create a mesh able to regulate potential impacts from proposed development of various magnitude.

Post-management risks were rated (Table 5-1 and Appendix A) 'low', except for post-management risks related to the potential impact of climate change, which were rated as 'medium' and 'high' (five individual risks related to common issue of climate change). This confirms that the regulatory and planning framework applied to potential impacts identified in the EBR is comprehensive.

The remaining potential impacts not captured by the framework typically present a low risk that are, in many cases, expressly exempt from regulation such as via exemptions or 'accepted development' provisions. Some of these are referred to in Appendix A and include the following:

- Operational work for waterway barrier works is accepted development under the Planning Act via the *Planning Regulation 2017* (Planning Regulation) subject to certain conditions being met
- Operational work for clearing of native vegetation is accepted development if the work complies with a vegetation clearing code
- Operational work for taking or interfering with water is accepted development under the Planning Regulation subject to certain conditions being met
- Clearing of native vegetation is exempt of approval under particular circumstances listed in the Planning Regulation.

5.3 Regulatory gaps identified

The EBR identifies climate change-related potential impacts to values associated with the Port of Abbot Point and surrounding areas, as summarised below:

- Potential impacts to marine and estuarine water quality associated with increased intensity of storm events and storm surge due to climate change, causing elevated loads of sediment, nutrients and contaminants
- Vulnerability of coastal areas to sea level rise as the inland migration of wetlands is blocked by growing populations and developments
- Potential impacts to coastal processes associated with increased vulnerability of coastal areas to climate change-induced sea level rise and associated changes to coastal processes
- Potential impacts to seagrass associated with elevation of sea surface temperature due to climate change resulting in degradation or loss of habitat
- Potential impacts to coral reefs associated with elevation of sea surface temperature and increasing ocean acidification due to climate change resulting in degradation or loss of coral reef and coral habitat.

The post-management combined risk rating for the above-listed environmental values was assessed as 'medium' because:

- The contribution of new development to climate change-related threats is not addressed by any regulatory and planning instruments

- Several values at risk from climate change impacts are local attributes of the OUV of the GBRWHA; however, they have only a minor to moderate contribution to the OUV. They are listed below (refer to Section 4.3, with further detail provided in the EBR):
  - Diversity of seagrass
  - Coral reefs, coral reefs ecosystem, inshore fringing reefs, mid-shelf reefs, and exposed outer reefs, hard and soft corals, and coral spawning
  - Wetlands
- Values that is intrinsically associated with the Caley Valley Wetlands and marine shorelines, and have a significant contribution to the OUV, are bird diversity as well as significant, nesting, feeding and breeding habitat for shorebird and migratory birds. It is unclear what negative or positive effects sea level rise will have on the Caley Valley Wetlands or Abbot Point shorelines and how this will, in turn, affect associated bird life.

An additional risk identified is that of sea level rise caused by climate change resulting in the degradation or loss of marine plant habitat in intertidal areas. Its post-management risk rating was assessed as 'high' because:

- The contribution of new development to climate change-related threats is not addressed by any regulatory and planning instruments
- There are vast mangrove areas within the Abbot Point study area (i.e., Curlewis Bay) that have important value for fisheries, coastal water quality and coastal protection
- Mangroves have a moderate contribution to the GBRWH OUV.

It is noted that the Abbot Point LUP refers to climate change impacts, stating that:

"The region's climate, as well as local landforms, makes the port area susceptible to the natural hazards of floods and cyclones. These hazards, in addition to potential climate change impacts resulting from rising sea levels, are an important part of assessment of projects on strategic port land."

It also includes a Desired Environmental Outcome (DEO) on ecological processes (DEO ECOL. 3) stating that:

"Climate change assessment will form part of the design of projects on strategic port land, as appropriate".

While referring to climate change, the first statement relates to the need for port infrastructure to be resilient to climate change-related impacts. The DEO does not indicate that a climate change contribution assessment must consistently be undertaken for specific types or magnitude of development and does not specify whether the assessment must address the potential climate change-related impacts to environmental values as summarised above and detailed in the EBR.

Similarly, the NQBP Sustainable Port Development Guidelines, which support the LUP, address resilience of port infrastructure to climate change-related impacts but are silent on assessment of the contribution of port projects to climate change.

Climate change-related impacts have the potential to affect environmental matters protected at Commonwealth, Queensland and local government level, for example:

- The GBR is an MNES protected under the Commonwealth Government EPBC Act – coral reefs are at risk from climate change-induced ocean acidification, increased water temperatures and degrading water quality from increased runoff
- Marine plants are a Matter of State Environmental Significance (MSES) protected under the Queensland Government *Fisheries Act 1994* and Planning Act – seagrass is at risk from climate change-induced rising sea surface temperature
- Urban development is regulated by local councils - the inland migration of wetlands caused by climate change-induced sea level rise is at risk of being blocked by urban development.

Additionally, it is widely recognised that concerted action at all levels of government and society is required to effectively reduce the threats posed by climate change.

As such, the regulatory gap cannot be attributed to a single regulatory or planning instrument as several instruments may address climate change-related impacts from new development.

5.4 Consideration regarding geographical coverage of master planned area

As part of initial analysis, it was noted that no port-related instruments (i.e., LUP, NQBP Sustainable Port Development Guidelines and APSDA development scheme) address the mangrove/tidal flats to the west of Curlewis Bay, as illustrated in Figure 5-1.

The Curlewis Bay mangrove/tidal flats appear to be an enclave of land not included in the scope of the Port of Abbot Point land use planning and management.

Due to the topography of the Abbot Point area, the Curlewis Bay mangrove/tidal flats receive surface water drainage from adjacent areas, including the Caley Valley Wetlands. Most of the adjacent areas are regulated under the APSDA development scheme and/or the port LUP and are intended to support future port-related industrial development.

Therefore, it should be considered whether inclusion of the Curlewis Bay mangrove/tidal flats in the master planned area would achieve more coherent and holistic port environmental management outcomes.

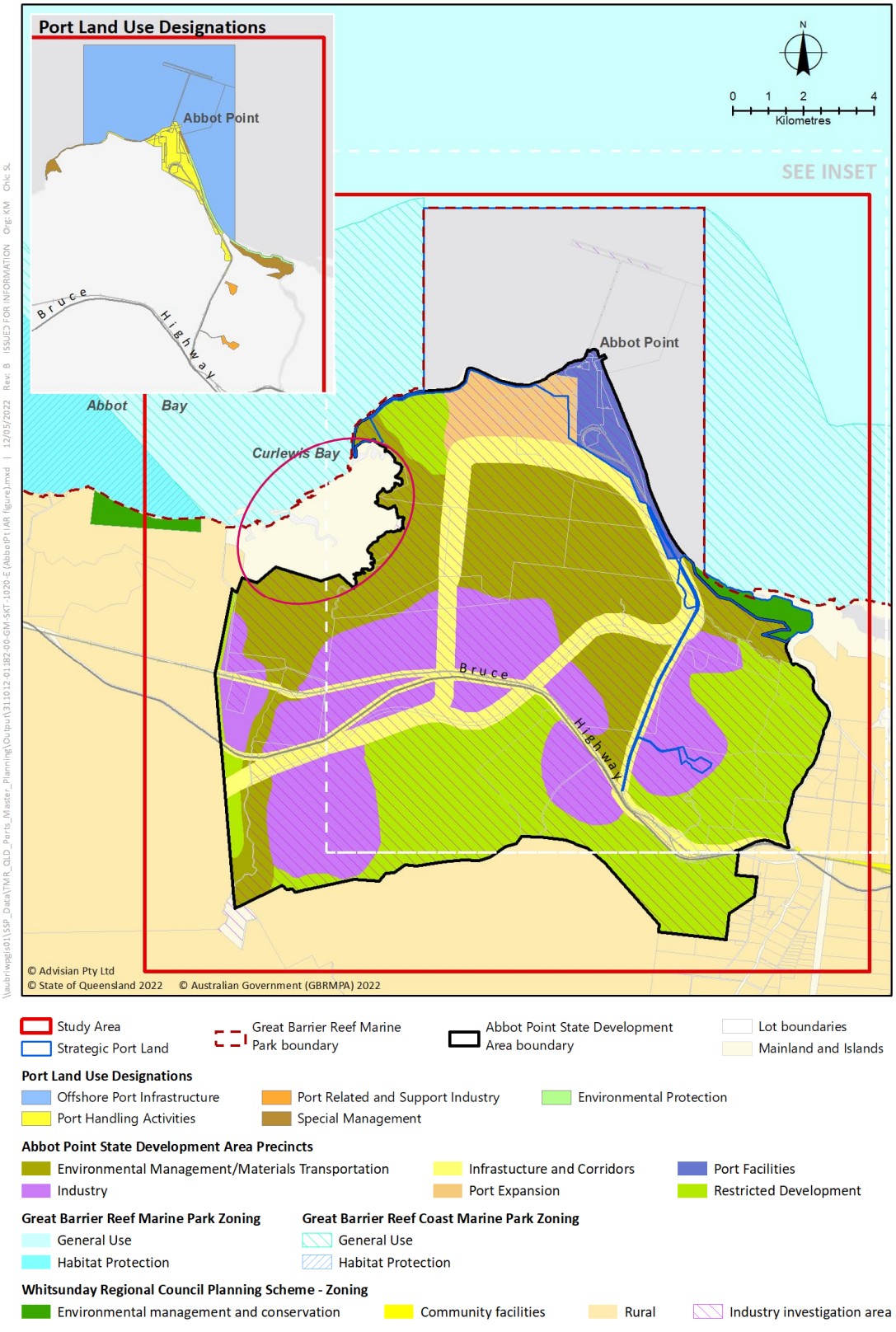

Figure 5-1 Consideration regarding geographical extent of master planned area

6 Gap analysis

6.1 Guiding principles

In completing the gap analysis, three principles (aligned with TMR's Priority Port Master Planning Guideline (TMR, 2020)) were used to guide the identification of matters for further consideration. These included that matters for further consideration be:

1. Evidence based
2. Proportionate
3. Only regulate by exception.

6.2 Analysis of findings

Table 5-1 presents a summary of the key outcomes of the risk assessment for the Port of Abbot Point. Of the potential impacts, threats or pressures identified, five were assessed as having a post management risk greater than 'low', which would therefore require further consideration and potential mitigation through the master plan and/or port overlay.

6.2.1 Climate change impacts

Four risks related to the potential impacts of climate change were assessed to be of 'medium' risk level :

- Increased intensity of storm events and storm surge causing elevated loads of sediment, nutrients and contaminants
- Increased vulnerability of coastal areas due to climate change-induced sea level rise and associated changes to coastal processes
- Elevation of sea surface temperature due to climate change resulting in degradation or loss of seagrass habitat
- Elevation of sea surface temperature and increasing ocean acidification due to climate change resulting in degradation or loss of coral reef and coral habitat.

The risk of degradation or loss of marine plant habitat in intertidal areas from climate change-related sea level rise was assessed to be of 'high' risk level.

With regard to climate change, all levels of government are beginning to develop legislation and policy to help avoid and mitigate potential impacts. At a Commonwealth Government level, there has been a commitment to achieve net zero greenhouse gas emissions by 2050, although this is yet to be reflected in legislation.

The following elements have been identified as relevant considerations for potential management of climate change-related impacts in master planning for the Priority Port of Abbot Point:

- The Ports Act purpose includes development of port master plans that establish a long-term vision for the future development of priority ports consistent with the principles of ecologically sustainable development, as defined in the EPBC Act

- The principles of ecologically sustainable development include the following principles that are relevant to potential impacts to environmental values from climate change:
  - Decision-making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations
  - The principle of inter-generational equity - that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations
  - The conservation of biological diversity and ecological integrity should be a fundamental consideration in decision-making.

As noted in Section 5.3 the Abbot Point LUP refers to climate change impacts and includes a DEO on ecological processes (DEO ECOL. 3) stating that:

"Climate change assessment will form part of the design of projects on strategic port land, as appropriate".

The LUP is supported by the NQBP Sustainable Port Development Guidelines, which requires consideration during project design of the effects of climate change on structures; however, neither the DEO nor the guidelines are required to consistently be applied based on the type or scale of development and both are focussed on the mitigation of impacts created by climate change rather than addressing the root cause.

Other instruments relating to the management of potential impacts from climate change exist, including bushfire management and coastal hazard considerations (coastal erosion, storm surge and flooding); however, the broader underlying causes of climate change are not specifically addressed through the instruments reviewed as part of the assessment.

While the master plan and port overlay are not able to address the root causes of climate change directly, it is acknowledged that development of land and infrastructure within the port master plan area must contribute positively to minimising climate change and mitigating potential impacts.

6.2.2 Geographical coverage

It was noted that no land use planning instruments relevant to the Priority Port of Abbot Point address an area of mangroves and tidal flats to the west of Curlewis Bay. This area receives surface water drainage from adjacent areas, including the Caley Valley Wetlands, most of which are regulated under the APSDA development scheme and/or the Port of Abbot Point LUP.

Inclusion of this location within the master plan area through application of a suitable planning precinct may help manage potential impacts on this land in the future.

6.3 Matters to be considered

Based on the assessment outlined here, the following matters should be given further consideration during development of the master plan and port overlay:

- The master plan will include a series of objectives and desired outcomes. The issue of climate change and its potential impacts could potentially be addressed through one or more of these statements

- Inclusion of land to the west of Curlewis Bay within the master plan area and application of a suitable planning precinct to this land.

7 Concluding analysis

7.1 Purpose and methodology

The TMR Method seeks for the concluding analysis to review the management measures proposed for inclusion in the draft master plan and draft port overlay, with the aim to verify that proposed management measures in the draft master plan and draft port overlay do not inadvertently create a regulatory gap or unintended consequence to, or within pre-existing regulatory requirements. For example, the port overlay overrides local and state planning requirements to the extent that there is any inconsistency, which could create a regulatory gap if existing processes are not appropriately considered.

Under the TMR Method, the concluding analysis is to be undertaken as a risk assessment similar to that of the Initial Analysis but accounting for application of the draft master plan and draft port overlay management measures in addition to pre-existing management measures.

7.2 Draft master plan and draft port overlay measures

This section presents a summary of the management measures contained in the draft master plan and draft port overlay.

7.2.1 Port precincts

The role of precincts is to identify the long-term purpose and intent for specific areas within the master planned area. The precincts provide for the spatial implementation of the master plan.

The following precincts are included within the master planned area and are illustrated in Figure 7-1:

- Environmental management precinct
- Infrastructure and supply chain corridors precinct
- Marine infrastructure precinct
- Port, industry and commerce precinct.

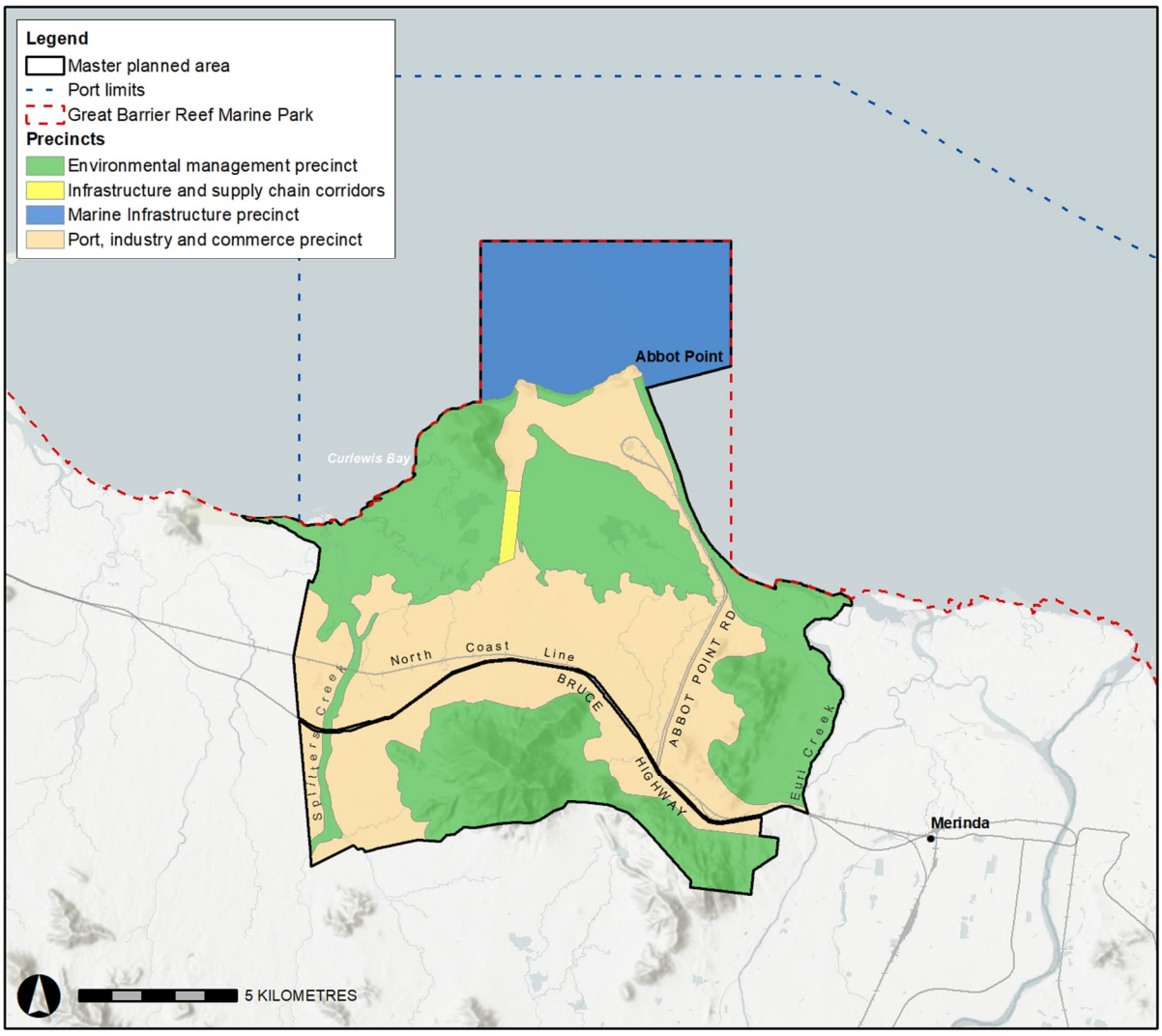

Figure 7-1 Abbot Point master planned area precincts

The draft master plan assigns to each precinct a purpose, a description, outcomes to be achieved and environmental management framework objectives to be considered through future planning.

7.2.2 Strategic vision, objectives, state interests and desired outcomes

The following sections have been prepared based on the wording contained in the draft master plan and draft port overlay 2022.

The Long-term strategic vision for the master planned area to 2050 is as follows:

The priority Port of Abbot Point will be a critical gateway for significant industries and emerging trade opportunities driving the long-term growth of Queensland. Sustainable port development will manage the diverse environment, rich cultural and social values contributing to the protection of the Outstanding Universal Value of the Great Barrier Reef World Heritage Area and the Caley Valley Wetlands.

State interests and their associated objectives and desired outcomes are as follows:

- Management of port-related development:
  - Objectives:
    - Sustainable development – enable ongoing sustainable trade growth through the priority Port of Abbot Point
    - Efficient land use – develop land and marine infrastructure efficiently to minimise impacts
    - Port optimisation – maintain and enhance the effective and efficient operation of the port.
  - Desired outcomes:
    - Port optimisation – land and marine areas are optimised for port operations and associated industries
    - Capital dredging – capital dredging is undertaken, where necessary, to support the safe and efficient growth of the priority Port of Abbot Point
    - Maintenance dredging – maintenance dredging is undertaken to ensure safe and efficient navigation of waterways in accordance with relevant legislative requirements.
- Economic
  - Objectives:
    - Economic prosperity – facilitate economic growth and enable regional economic development
    - Sustainable trade – ensure the priority port is positioned to support emerging industry and trade diversification.
  - Desired outcomes:
    - Industrial powerhouse – port development and related industries of state and national significance are encouraged
    - Employment opportunities – sustainable development and trade diversification create regional job opportunities
    - Extractive resources – the economic value of extractive resources and other minerals is recognised
    - Emerging industry – the establishment and growth of emerging industries is enabled.
- Environment
  - Objectives:
    - Protecting the GBRWHA – port-related development contributes to the protection of the OUV of the GBRWHA and the Caley Valley Wetlands
    - Environmental values – avoid, minimise and offset impacts from development on environmental values within and surrounding the master planned area.
  - Desired outcomes:
    - Beneficial re-use – material generated from capital dredging is beneficially re-used
    - Sustainable port development – environmental values and ecological processes are protected, including the Caley Valley Wetlands and values that contribute to the OUV of the GBRWHA

        - Leading environmental practice – existing Commonwealth and state legislation, planning processes and policies are addressed to achieve leading practice in a GBR context.
- Infrastructure:
    - Objectives:
        - Supply chain efficiency – safeguard land required for supply chain infrastructure to maximise the effective operation of the port
        - Infrastructure utilisation – locate port-related development to support efficient operation of supply chain infrastructure
        - Industrial opportunities – coordinate port and supply chain infrastructure to support emerging industries.
    - Desired outcomes:
        - Supply chain infrastructure – critical supply chain corridors and infrastructure are protected including connections between port operations and areas of industrial development
        - Common user infrastructure – infrastructure is planned and provided to support changing technologies, facilitate use by multiple proponents and promote port utilisation
        - Optimised infrastructure – the capacity of port and supply chain infrastructure is optimised.
- Community:
    - Objectives:
        - Community safety – provide for the safety and security of people, shipping, and property
        - Connection to country – recognise the ongoing cultural and spiritual connection the Juru people have with Land and Sea Country.
    - Desired outcomes:
        - Health and safety – industrial activities including hazardous chemical facilities are designed, located and managed to minimise risks to human health and safety and the built environment
        - Cultural significance – development and activities are managed to avoid harm to cultural heritage and connections with Land and Sea Country.

7.2.3 Environmental management framework

The EMF describes the interaction of port-related development with environmental values.

The role of the EMF in the master plan includes:

- Identifying environmental values: identifying and mapping environmental values within and surrounding values within and surrounding the master planned area, including those that contribute to the OUV of the GBRWHA
- Identifying potential impacts: identifying any potential impacts that development in the master planned area may have on environmental values
- Managing impacts: stating the EMF objectives and measures (priority management measures) for managing impacts that have been identified.

With regards to the management of impacts, EMF objectives have been assigned to each of the master planned area precincts. Due to the comprehensive nature of Commonwealth and State requirements, approvals and operational environmental management measures that apply to development within the master planned area, only one PMM was developed. This PMM is intended to protect and enhance the Caley Valley Wetlands:

Prepare and implement a coordinated management strategy which integrates economic, environmental and cultural values to protect and enhance the Caley Valley Wetlands and associated environmental values.

This PMM applies to the following master planned area precincts:

- Environmental management
- Infrastructure and supply chain corridors
- Marine infrastructure
- Port, industry and commerce.

7.3 Assessment of risk

The TMR Method requires the concluding analysis to:

- Undertake an assessment of matters identified as a high post management risk during the initial analysis to determine the risk to identified values if the proposed management measures developed for the master plan and port overlay are applied (refer to section 7.3.1)
- Undertake an assessment of all areas within the master planned area to ensure no inadvertent increase to the post-management risk profile of identified values occurs as part of master plan implementation (refer to section 7.3.2)
- Undertake an assessment of any remaining matters that may require further consideration or management intervention but are outside of the scope of master planning implementation under the Ports Act (refer to section 7.3.3).

The following sections apply the above assessments to the draft master plan and draft port overlay.

7.3.1 Assessment of matters identified as a high post management risk

The Initial Analysis identified one climate change-related risk having a “high” post-management risk and the others being of “medium” post-management risk (refer to Table 5-1). Climate change-related impacts are beyond the land use management scope of the master plan and port overlay, and are also beginning to be addressed at State, National (and port industry) levels (refer to section 7.3.3). As such, it would be counterproductive for the master plan and port overlay to risk interfering with such initiatives[4]. Consequently, no formal risk assessment was required to determine the risk to identified values from the proposed management measures developed for the draft master plan and draft port overlay.

[4] It should be noted that port master planning indirectly contributes to limiting greenhouse gas emissions from port activities by fostering efficient port land use, thereby preventing or limiting the need for development of additional ports along the Queensland Coast.

7.3.2 Assessment of master planned areas to ensure no inadvertent increase to the post-management risk profile

Within a master plan and port overlay, the following provisions have the potential to contradict the application of existing regulations pertaining to port development:

- The PMM (refer to section 7.2.3)
- Any port overlay provision that would override local and state planning requirements (e.g., development controls).

Other port master plan and port overlay measures such as the port precincts, strategic vision, objectives, state interests, desired outcomes and EMF do not directly impact on the assessment of port development and therefore are not at risk of contradicting existing regulation.

The following sections discuss the PMM and port overlay development controls.

7.3.2.1 Priority Management Measure

The PMM established under the EMF by the draft port overlay manages impacts from development on environmental values. Due to the comprehensive nature of Commonwealth and State regulations, approvals and operational environmental management measures that apply to development within the master planned area, a single PMM has been established. It seeks to protect and enhance the Caley Valley Wetlands. Applicable to the Environmental Management, Infrastructure and Supply Chain Corridors, Marine Infrastructure and Port, Industry and Commerce precincts, the PMM requires the following:

Prepare and implement a coordinated management strategy which integrates economic, environmental and cultural values to protect and enhance the Caley Valley Wetlands and associated environmental values.

The PMM is consistent with the requirements of existing management measures (refer to section 3.3) as it seeks to achieve protection of the Caley Valley Wetlands.

The draft port overlay establishes requirements on plan-making for the following regulatory instruments:

- Planning Act: matters WRC must consider in making or amending local planning instruments
- Transport Infrastructure Act: matters NQBP must consider in making or amending the Port of Abbot Point Land Use Plan.
- SDPWO Act: matters the Coordinator-General must consider when making or amending the APSDA Development Scheme.

7.3.2.2 Port Overlay development controls

Due to the comprehensiveness of existing management measures, the draft port overlay only seeks to guide plan-making by WRC, NQBP and the Coordinator-General. It does not establish development controls with which proposed development at the port must comply.

As the PMM seeks to achieve similar outcomes as existing management measures and the draft port overlay does not establish controls for proposed development, there is no risk of inadvertent increase

to the post-management risk profile of identified values from the master plan implementation. Therefore, undertaking a detailed risk assessment as stipulated in the TMR Method is considered unwarranted as there would be no change to the port management risk profile.

7.3.3 Assessment of remaining matters outside of the scope of master planning implementation

Climate change-related risks identified in the EBR and assessed in the Initial Analysis are caused by global greenhouse gas emissions, including Australia's, which are beyond the scope and purpose of the master plan and the Ports Act in its aim to manage port development. However, the draft master plan acknowledges that climate change is the single biggest threat to coral reefs and exacerbates localised impacts on the Great Barrier Reef and other ecological processes. It recognises that the long-term outlook for the GBRWHA is critically dependent on limiting global temperature rise to the maximum extent possible, as quickly as possible.

With the effort to curb Australia's greenhouse gas emissions and bolster its resilience to climate change impacts being led at State and National levels, it is expected that the climate change-related risks identified by the EBR, and assessed in the Initial Analysis, will be accounted for in the future development of State and Commonwealth policies/regulations that address climate change.

7.4 Conclusion

The concluding analysis has found that the draft master plan is consistent with existing regulations and that its provisions are unlikely to weaken the existing regulatory framework applying to development. The proposed PMM strengthens existing development controls within the port land use plan, APSDA Development Scheme and the WRC planning scheme while seeking to achieve similar outcomes for the Caley Valley Wetlands as existing development controls from these instruments. The Port Overlay only seeks to guide plan-making by WRC, NQBP and the Coordinator-General. It does not establish development controls with which proposed development at the port must comply.

Consequently, the concluding analysis did not identify any need for the draft master plan and draft port overlay provisions to be amended.

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Appendix A
Initial analysis risk assessment tables – Port of Abbot Point

1 Marine values

1.1 Marine and estuarine water quality

Table 1 Initial risk

Key: OUV: Outstanding Universal Value; C: Consequence; L: Likelihood

Risk Description			Initial Risk		
OUV (Y/N)	Potential impacts, threats or pressures	Development activities	C	L	Original risk
N	Maintenance and/or capital dredging causing increased sedimentation and turbidity. Stormwater runoff from development areas, including vegetation clearing, earthworks and operational activities causing elevated loads of sediment, nutrients and contaminants. Elevated sediment, nutrient and contaminant loads through construction and operational activities including reclamation, wastewater discharge and dust emissions. Disturbance of ASS during construction and operational activities. Increased intensity of storm events and storm surge due to climate change causing elevated loads of sediment, nutrients and contaminants.	Special development (highest level of impact)	Moderate	Possible	Medium
		High/medium impact development	Moderate	Possible	Medium
		Low impact development	Minor	Possible	Low

Table 2 Post management risk

Key: OUV: Outstanding Universal Value; C: Consequence; L: Likelihood; MM applic.: Management measure application; PM risk: Post-management risk

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
N	Maintenance and/or capital dredging causing increased sedimentation and turbidity. Stormwater runoff from development areas, including vegetation clearing, earthworks and operational activities causing elevated loads of sediment, nutrients and contaminants. Elevated sediment, nutrient and contaminant loads through construction and operational activities including reclamation, wastewater discharge and dust emissions. Disturbance of ASS during construction and operational activities. Increased intensity of storm events and storm surge due to climate change causing elevated loads of sediment, nutrients and contaminants.	Sea Dumping Act	1*	Minor	Unlikely	Low	Medium	The Act regulates the offshore disposal of dredge material, one of the aims being the preservation of water quality.	The combined application of Commonwealth, State, Local Government and port-specific instruments (as detailed in column 'Matter for consideration') to the potential impacts/threats/pressures from new development is comprehensive. However, the increase in intensity of storm surge and heavy rainfall events caused by climate change and threatening the health and quality of coastal waters is not addressed in any instrument considered in the initial analysis. The post-management risk is medium due to the current water quality within the Abbot Point study area being already affected by elevated loads of sediment, nutrients and contaminants.
		EPBC Act	1*	Minor	Unlikely	Low		The Act's referral and controlled action assessment process provides for rigorous assessment where there is a potential for significant impact on a matter of national environmental significance, such as a threatened marine species that relies on water quality to support habitat (e.g., seagrass, algae).	
		Great Barrier Reef Marine Park Act / GBRMP zoning plan (general use zone)	1*	Minor	Unlikely	Low		The Zoning Plan requires a permit for dredging, dumping of spoil and harbour works. The permit can impose conditions aiming to preserve water quality from these activities.	
		Great Barrier Reef Marine Park Act / GBRMP zoning plan (Habitat protection zone)	1*	Minor	Unlikely	Low		The Zoning Plan requires a permit for dredging, dumping of spoil and harbour works. The permit can impose conditions aiming to preserve water quality from these activities.	
		Coastal Protection and Management Act, Environmental Protection Act / Planning Act / SDAP	1*	Minor	Unlikely	Low		Tidal works proponents are required to demonstrate how contamination of marine waters will be prevented. SDAP State code 8: Coastal development and tidal works includes performance outcomes focused on the prevention of erosion, maintaining water quality and the management of dredging activities in accordance with the National Assessment Guidelines for Dredging. SDAP State code 9: Great Barrier Reef wetland protection areas includes performance outcomes on avoidance of impacts on wetland protection areas, including water quality.	
		Environmental Protection Act / Planning Act - SDAP	1*	Minor	Unlikely	Low		The Acts prohibit disposal of listed contaminants in waters. Environmental Authorities for dredging ERA impose water quality criteria for project proponents to meet. Environmental Authorities for ERA covering coal stockpiling can place limits on coal dust deposition rates.	
		Fisheries Act / Planning Act / SDAP	2**	Minor	Possible	Low		Assessment under the Act would only address water quality if it was a factor at risk of affecting marine plants. The Act requires water quality degradation to be assessed as part of development proposals to predict the impacts on marine plants and requires mitigation measures to be implemented. SDAP State code 11: Removal, destruction or damage of marine plants includes performance outcomes on	

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
								avoidance and mitigation of impacts on marine plants, including aspects influencing water quality.	
		Marine Parks Act / GBRCMP zoning plan (general use zone)	1*	Minor	Possible	Low		The Zoning Plan requires a permit for dredging, dumping of spoil and harbour works. The permit can impose conditions aiming to preserve water quality impacted by these activities.	
		Marine Parks Act / GBRCMP zoning plan (Habitat protection zone)	1*	Minor	Possible	Low		The Zoning Plan requires a permit for dredging, dumping of spoil and harbour works. The permit can impose conditions aiming to preserve water quality impacted by these activities.	
		State Development and Public Works Organisation Act	1*	Minor	Possible	Low		The Act's environmental impact assessment process provides for rigorous assessment of major projects to ensure development occurs in a sustainable manner and unacceptable impacts on values, including marine water quality, do not occur.	
		Sustainable Ports Act	2**	Minor	Unlikely	Low		The Act indirectly protects water quality by restricting port development along the GBR coast. The Act restricts capital dredging to four priority ports along the Great Barrier Reef coast (including Abbot Point) and prohibits the disposal of port-related capital dredge material within a restricted area (i.e., within the Great Barrier Reef World Heritage Area but outside the Commonwealth GBR marine park), which assists in safeguarding water quality. Prohibits development relating to a port facility within the State GBR marine park and within a restricted area that is outside of a port's existing port limits. Mandates the master planning for priority ports adjacent to the GBR coast, which may regulate impacts on water quality not already regulated by existing legislative/planning instruments.	
		Transport Operations (Marine Pollution) Act	1*	Minor	Unlikely	Low		The Act regulates discharges of pollutants from ships including oils, chemicals, sewage and garbage into coastal waters.	
		Vegetation Management Act / Planning Act / SDAP	1*	Minor	Unlikely	Low		SDAP Code 16 includes the following performance outcomes: - Clearing maintains natural wetland and watercourse/drainage feature vegetation to protect bank stability by protecting against bank erosion, water quality by filtering sediments, nutrients and other pollutants. - Clearing does not result in accelerated soil erosion within or outside the land the subject of the development application. - Clearing does not contribute to or accelerate land degradation through waterlogging, or through the salinisation of groundwater, surface water or soil. - Clearing does not result in, or accelerate, disturbance of acid sulfate soils or	

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
								changes to the hydrology of the location that will result in either aeration of horizons containing iron sulphides or mobilisation of acid or metals. - The duration of clearing for a vegetation retention purpose occurs only for a period that will not contribute to land degradation.	
		Water Act / Planning Act - SDAP	1*	Minor	Possible	Low		The Water Act's Riverine Protection Permit for works within the banks of watercourses seeks to prevent bank destabilisation that would lead to erosion and water sedimentation. Exemptions apply.	
		Reef 2050 Long-Term Sustainability Plan	3***	Moderate	Possible	Medium		The Plan is a policy document that requires regulatory instruments such as Acts, Regulations or local planning schemes to make its provisions enforceable. The Plan commits Queensland to advancing the preparation of master plans for priority ports to ensure the environmental values of the GBRWHA are managed; commits to limiting port-related capital dredging in priority ports and beneficial reuse of dredge spoil. Refer to Sustainable Ports Act.	
		State Planning Policy	1*	Minor	Unlikely	Low		The SPP is a policy document that requires regulatory instruments such as Acts, Regulations or local planning schemes to make its provisions enforceable (except assessment benchmarks). The SPP's State interest – coastal environment requires local planning schemes to integrate development outcomes such as wetland and native vegetation conservation in the coastal management district, which are known to improve quality of stormwater. The SPP's State interest – water quality requires local planning schemes to integrate development outcomes focused on improving the quality of stormwater. Appendix 2 sets out stormwater management design objectives for construction and post construction phases. The SPP's State interest – emissions and hazardous activities requires local planning schemes to integrate development outcomes focused on avoiding and limiting emissions from hazardous activities, including to stormwater, as well as the mobilisation of ASS. The SPP establishes assessment benchmarks for water quality to apply when local planning schemes do not integrate the listed policies. These apply to MCU, RoL and operational work applications.	
		Mackay, Isaac and Whitsunday Regional Plan	3***	Moderate	Possible	Medium		The Plan is a policy document that requires regulatory instruments such as Acts and Regulations to make its provisions enforceable. DRO Environment includes a focus on water quality, waterway health and wetlands, which includes the following policies: - Development is located, designed and managed to protect the environmental values and water quality of surface water and groundwater, wetlands and their associated buffers and coastal waters.	

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
								- Strategies to protect, manage and rehabilitate riparian areas and wetlands are incorporated into land-use planning to maintain and enhance their water quality, scenic, biodiversity, ecological, recreational and corridor values. Supporting programs consist of the following: - Support land management practices that protect waterway health through the voluntary uptake of industry-led programs and incentives. - Develop and monitor regional targets for water quality and waterway health.	
		Abbot Point State Development Area Development Scheme	1*	Minor	Unlikely	Low		SDA wide assessment criteria address water quality directly by requiring compliance with the Environmental Protection (Water) Policy 2009, by requiring avoidance of ASS and contaminated material mobilisation and by referring to engineering standards on stormwater quality and erosion. Assessment criteria apply to all proposed development in the SDA, uniformly deemed a MCU or ROL. The C-G applies the same assessment level as for development proposed under the Planning Act.	
		Transport Infrastructure Act / Land use plan / Sustainable Port Development Guidelines	1*	Minor	Unlikely	Low		All works (excluding minor works) on strategic port land and in port waters require a Port Development Approval. For developments triggering assessment under the Planning Act, the Planning Regulation determines when the LUP (and SPDG) is applicable. Development not requiring approval under the Planning Act is assessed against the LUP/SPDG under the port development consent process. Development assessable under the Planning Act located within SPL requires approval from NQBP and assessment against the LUP and SPDG. The LUP requires development of port land to comply with EPP Water. The LUP DEOs apply across all SPL as general measures to ensure ecological and environmental considerations are adopted as part of development approvals under the Land Use Plan. The SPDG include objectives on discharge to water management and protection of environmental values. They include requirements for environmental assessment of discharges as well as specific requirements on stormwater quality and groundwater quality.	
		Whitsunday Regional Council Planning Scheme - Rural activities code	1*	Minor	Unlikely	Low		The code includes a performance outcome requiring intensive rural activities to be sited and designed on a lot of sufficient area to provide for adequate setbacks to waterways or wetlands. The code also includes a performance outcome requiring intensive rural activities to have appropriate disposal of waste and contaminants, with acceptable outcomes being to ensure that off-site release of contaminants does not occur and no significant adverse impacts occur to surface or ground water. Only applicable to intensive activities.	
		Whitsunday Regional Council Planning	1*	Minor	Unlikely	Low		The scheme's objectives include general exclusion of most forms of development; natural features, such as creeks, gullies, waterways, wetlands,	

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
		Scheme - Environmental management and conservation						flora and fauna communities, habitats, vegetation and bushland, are protected and buffered from activities in the zone and adjoining land uses. All proposed developments are assessable against the whole planning scheme.	
		Whitsunday Regional Council Planning Scheme - Rural zone	1*	Minor	Possible	Low		The zone code allows development of a broad range of rural activities, including animal husbandry, cropping, roadside stalls and wholesale nurseries, animal keeping, aquaculture, intensive animal industry, intensive horticulture and rural industry, provided that adverse environmental and amenity impacts are avoided or appropriately managed through sensitive location, design, operation and management. The rural activities code generally applies. For the most impacting developments, the assessment must be against the full planning scheme. The rural activities code requires that off-site release of contaminants does not occur and requires no significant adverse impacts on surface or groundwater resources.	
		Whitsunday Regional Council Planning Scheme - Environmental significance overlay code	1*	Minor	Unlikely	Low		The overlay code includes the following performance outcomes, which contribute to avoiding erosion and sedimentation: - The long-term management and maintenance of the stream protection zone - Development of premises adjoining or containing Regulated vegetation intersecting a watercourse must not adversely affect the integrity of the riparian corridor.	
		Whitsunday Regional Council Planning Scheme - ASS overlay code	1*	Minor	Unlikely	Low		The overlay code seeks to ensure development does not release acid and associated metal contaminants into the environment.	
		Whitsunday Regional Council Planning Scheme - Coastal environment overlay code	1*	Minor	Unlikely	Low		The overlay code includes the performance objective for development to avoid the release of hazardous materials into floodwaters.	
		Whitsunday Regional Council Planning Scheme - Waterways and wetlands overlay code	1*	Minor	Unlikely	Low		The overlay code includes the following performance objectives: - For development to be planned and designed considering the land use constraints of the site for achieving stormwater design objectives - For development to not discharge wastewater to a waterway or off site unless demonstrated to be best-practice environmental management for that site. - For stormwater to not discharge directly to a non-tidal artificial waterway without treatment to achieve stormwater quality management	

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
								- For construction activities to avoid or minimise adverse impacts on stormwater quality. - For wastewater discharge to a waterway to be managed in a way that maintains ecological processes, riparian vegetation, waterway integrity and downstream ecosystem health. The overlay code prescribes stormwater management design objectives for construction and post construction.	

1.2 Coastal processes (bathymetry, tides, currents, waves, sediment transport)

Table 3 Initial risk

Key: OUV: Outstanding Universal Value; C: Consequence; L: Likelihood

Risk Description			Initial Risk		
OUV (Y/N)	Potential impacts, threats or pressures	Development activities	C	L	Original risk
Y Cix - Min	Alteration of topography and hydrology through development of port infrastructure and removal or placement of material in the marine environment (such as through reclamation, dredging and dredge material placement) causing changes to currents, waves and sediment transport. Increased vulnerability of coastal areas to climate change-induced sea level rise and associated changes to coastal processes.	Special development (highest level of impact)	Major	Possible	High
		High/medium impact development	Moderate	Possible	Medium
		Low impact development	Minor	Unlikely	Low

Table 4 Post management risk

Key: OUV: Outstanding Universal Value; C: Consequence; L: Likelihood; MM applic.: Management measure application; PM risk: Post-management risk

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
Y Cix - Min	Alteration of topography and hydrology through development of port infrastructure and removal or placement of material in the marine environment (such as through reclamation, dredging and dredge material placement) causing changes to currents, waves and sediment transport. Increased vulnerability of coastal areas to climate change-induced sea level rise and associated changes to coastal processes.	Sea Dumping Act	1*	Minor	Possible	Low	Medium	The Act regulates the offshore disposal of dredge material, including the aim to avoid the creation of underwater sediment mounds.	The combined application of Commonwealth, State, Local Government and port-specific instruments (as detailed in column 'Matter for consideration') to the potential impacts/threats/pressures from new development is comprehensive. However, sea level rise caused by climate change and impacting on wetlands is not addressed in any instrument considered in the initial analysis. While some existing regulatory
		EPBC Act	2**	Moderate	Possible	Medium		The Act's referral and controlled action assessment process provides for rigorous assessment where there is a potential for changes in seafloor topography or hydrology to cause significant impact on a matter of national environmental significance (e.g., via impacts on food sources like marine plants).	
		Great Barrier Reef Marine Park Act / GBRMP zoning plan (general use zone)	1*	Minor	Unlikely	Low		The Zoning Plan requires a permit for dumping of spoil, harbour works, building a facility or constructing mooring facilities. The application assessment considers impacts to seafloor topography and changes in hydrology.	

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
		Great Barrier Reef Marine Park Act / GBRMP zoning plan (Habitat protection zone)	1*	Minor	Unlikely	Low		The Zoning Plan requires a permit for dumping of spoil, harbour works, building a facility or constructing mooring facilities. The assessment considers impacts to seafloor topography and changes in hydrology.	measures (e.g. coastal management district, erosion prone areas) will assist in indirectly mitigating impacts to coastal areas from sea level rise, no instrument considered in the initial analysis addresses climate change as the root cause.
		Coastal Protection and Management Act, Environmental Protection Act / Planning Act / SDAP	1*	Minor	Unlikely	Low		Tidal works proponents are required to demonstrate how structures in the tidal area do not, or have minimal, impact on coastal processes. SDAP State code 8: Coastal development and tidal works includes performance outcomes focused on the protection of coastal processes from interference and the management of dredging activities in accordance with the National Assessment Guidelines for Dredging. Operational work for tidal works or work within a coastal management district by State or Local Government is accepted development only if the works comply with accepted development requirements, which require avoidance of impacts to natural features of tidal water.	
		Fisheries Act / Planning Act / SDAP	2**	Moderate	Unlikely	Medium		Assessment under the Act would only address changes to seafloor topography and hydrology if they were factors at risk of affecting marine plants. The Acts assessment process provides for assessment where there is a potential for changes in seafloor topography or hydrology to cause significant impact on a matter of state environmental significance (e.g. marine plants).	
		Marine Parks Act / GBRCMP zoning plan (general use zone)	1*	Minor	Unlikely	Low		The Zoning Plan requires a permit for dumping of spoil, harbour works, building a facility or constructing mooring facilities. The application assessment considers impacts to seafloor topography and changes in hydrology.	
		Marine Parks Act / GBRCMP zoning plan (Habitat protection zone)	1*	Minor	Unlikely	Low		The Zoning Plan requires a permit for dumping of spoil, harbour works, building a facility or constructing mooring facilities. The application assessment considers impacts to seafloor topography and changes in hydrology.	
		State Development and Public Works Organisation Act	1*	Minor	Possible	Low		The Act's environmental impact assessment process provides for rigorous assessment of major projects to ensure development occurs in a sustainable manner and unacceptable impacts on values, including coastal processes, do not occur.	
		Sustainable Ports Act	2**	Minor	Rare	Low		The Act indirectly protects against changes in seafloor topography and hydrology by restricting port development along the GBR coast.	

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
								The Act restricts capital dredging to four priority ports along the Great Barrier Reef coast (including Abbot Point) and prohibits the disposal of port-related capital dredge material within a restricted area (i.e., within the Great Barrier Reef World Heritage Area but outside the Commonwealth GBR marine park), which prevents interference with coastal processes. The Act prohibits development relating to a port facility within the State GBR marine park and within a restricted area that is outside a port's existing port limits. It also mandates the master planning for priority ports adjacent to the GBR coast, which may regulate impacts on coastal processes not already regulated by existing legislative/planning instruments.	
		Reef 2050 Long-Term Sustainability Plan	3***	Moderate	Possible	Medium		The Plan is a policy document that requires regulatory instruments such as Acts, Regulations or local planning schemes to make its provisions enforceable. The Plan commits Queensland to limiting port-related capital dredging in priority ports and the beneficial reuse of dredge spoil instead of offshore disposal. Refer to Sustainable Ports Act.	
		State Planning Policy	2**	Moderate	Possible	Medium		The SPP is a policy document that requires regulatory instruments such as Acts, Regulations or local planning schemes to make its provisions enforceable (except assessment benchmarks). The SPP's State interest – coastal environment requires local planning schemes to integrate development outcomes ensuring that coastal development avoids adverse impacts on coastal processes.	
		Transport Infrastructure Act / Land use plan / Sustainable Port Development Guidelines	1*	Minor	Unlikely	Low		All works (excluding minor works) on strategic port land and in port waters require a Port Development Approval. For development not requiring approval under the Planning Act: the SPDG require proponents of marine structures to discuss the basis of design with NQBP in situations where consideration of metocean conditions will form a significant part of the design.	
		Whitsunday Regional Council Planning Scheme - Coastal environment overlay	1*	Minor	Unlikely	Low		The overlay code includes the objective for development to maintain and enhance natural processes, including those below tidal waters. The overlay code includes the performance objective for development to be located outside of an Erosion prone or Permanent inundation area, except in limited circumstances.	

1.3 Marine plants (mangroves/saltmarshes, seagrass/macroalgae)

Table 5 Initial risk

Key: OUV: Outstanding Universal Value; C: Consequence; L: Likelihood

Risk Description			Initial Risk		
OUV (Y/N)	Potential impacts, threats or pressures	Development activities	C	L	Original risk
Y Cvii, Cx - Mod Cix - Min	Vegetation clearing resulting in direct loss of marine plants and reduction of habitat quality in remaining areas due to edge effects (including through increased availability of access) that reduce extent, condition and quality of mangrove and intertidal flora communities. Development of port infrastructure and removal or placement of material in the marine environment (such as through reclamation, dredging and dredge material placement) resulting in direct loss of marine plants and associated habitat and reduction of habitat quality in adjacent areas due to altered coastal processes and including erosion and accretion of sediments. Elevated sediment, nutrient and contaminant loads in water due to stormwater runoff and emissions and discharges from construction and operational activities (including reclamation and dredging) causing a decline in quality or loss of marine plant habitat. Elevation of sea surface temperature due to climate change resulting in degradation or loss of seagrass habitat. Sea level rise resulting in the degradation or loss of marine plant habitat in intertidal areas.	Special development (highest level of impact)	Major	Likely	High
		High/medium impact development	Moderate	Possible	Medium
		Low impact development	Minor	Unlikely	Low

Table 6 Post management risk

Key: OUV: Outstanding Universal Value; C: Consequence; L: Likelihood; MM applic.: Management measure application; PM risk: Post-management risk

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
Y Cvii, Cx - Mod Cix - Min	Vegetation clearing resulting in direct loss of marine plants and reduction of habitat quality in remaining areas due to edge effects (including through increased availability of access) that reduce extent, condition and quality of mangrove and intertidal flora communities. Development of port infrastructure and removal or placement of material in the marine environment (such as through reclamation, dredging and dredge material placement) resulting in direct loss of marine plants and associated habitat and reduction of habitat quality in adjacent areas due to altered coastal processes and including erosion and accretion of sediments. Elevated sediment, nutrient and contaminant loads in water due to stormwater runoff and emissions and discharges from construction and operational activities (including reclamation and dredging) causing a decline in quality or loss of marine plant habitat. Elevation of sea surface temperature due to climate change resulting in degradation or loss of seagrass habitat. Sea level rise resulting in the degradation or loss of marine plant habitat in intertidal areas.	Sea Dumping Act	1*	Minor	Unlikely	Low	High	The Act regulates the offshore disposal of dredge material, one of the aims being to limit turbidity.	The combined application of Commonwealth, State, Local Government and port-specific instruments (as detailed in column 'Matter for consideration') to the potential impacts/threats/pressures from new development is comprehensive. However, the threat of rising sea surface temperature above tolerance thresholds of seagrass resulting in impacts to seagrass is not addressed in any instrument considered in the initial analysis. Similarly, the threat of sea level rise caused by climate change on intertidal areas is not addressed in any regulatory instrument considered in the initial analysis. The post-management risk is high due to: • the important amount of mangrove areas within the Abbot Point study area that have important value for fisheries, coastal water quality and coastal protection • absence of regulatory instrument addressing climate change as the root cause of sea level rise and absence of mitigation measures in existing regulatory instruments against sea level rise impacts on intertidal fauna and flora habitat.
		EPBC Act	1*	Minor	Possible	Low		The Act's referral and controlled action assessment process provides for rigorous assessment where there is a potential for significant impact on a matter of national environmental significance, such as a threatened marine species that relies on marine plants as a food source.	
		Great Barrier Reef Marine Park Act / GBRMP zoning plan (general use zone)	1*	Minor	Unlikely	Low		The Zoning Plan requires a permit for dredging, dumping of spoil and harbour works. The permit can impose conditions aiming to limit turbidity from these activities.	
		Great Barrier Reef Marine Park Act / GBRMP zoning plan (Habitat protection zone)	1*	Minor	Unlikely	Low		The Zoning Plan requires a permit for dredging, dumping of spoil and harbour works. The permit can impose conditions aiming to limit turbidity from these activities.	
		Great Barrier Reef Marine Park Act / GBRMP zoning plan (Conservation park zone)	1*	Minor	Unlikely	Low		The Zoning Plan does not list dredging or dumping of spoil as permissible activities.	
		Great Barrier Reef Marine Park Act / GBRMP zoning plan (Marine national park zone)	1*	Minor	Unlikely	Low		The Zoning Plan does not list dredging or dumping of spoil as permissible activities.	
		Coastal Protection and Management Act / Planning Act / SDAP	1*	Minor	Unlikely	Low		Tidal works proponents are required to assess the proposed development impact on marine plants. The Planning Act establishes the approval triggers and SDAP State Code 8 sets out the performance outcomes to be met. SDAP Code 8 also requires the management of dredging activities to be in accordance with the National Assessment Guidelines for Dredging.	

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
		Environmental Protection Act / Planning Act - SDAP	1*	Minor	Unlikely	Low		EAs for dredging ERA impose water quality criteria for project proponents to meet. Environmental Authorities for ERAs addressing coal stockpiling/handling can place limits on coal dust deposition rates. Activities not meeting the ERA thresholds are not regulated via EAs.	
		Environmental Offsets Act	2**	Minor	Unlikely	Low		The Act does not prevent environmental impacts from development but rather mitigates such impacts through offsets. The Act requires the offsetting of lost marine plants when a significant residual impact is demonstrated. Non-offset impacts may still occur for small development where this threshold is not reached.	
		Fisheries Act / Planning Act / SDAP	1*	Minor	Possible	Low		The Acts require direct and indirect impacts to marine plants to be assessed as part of development proposals and requires mitigation measures to be implemented. The Planning Act establishes the approval triggers and SDAP State code 11: Removal, destruction or damage of marine plants sets out the performance outcomes to be met. Operational work impacting on marine plants is accepted development under the Planning Regulation only if activities can comply with accepted development requirements.	
		Marine Parks Act / GBRCMP zoning plan (general use zone)	1*	Minor	Unlikely	Low		The Zoning Plan requires a permit for dredging, dumping of spoil and harbour works. The permit can impose conditions aiming to limit turbidity from these activities.	
		Marine Parks Act / GBRCMP zoning plan (Habitat protection zone)	1*	Minor	Unlikely	Low		The Zoning Plan requires a permit for dredging, dumping of spoil and harbour works. The permit can impose conditions aiming to limit turbidity from these activities.	
		State Development and Public Works Organisation Act	1*	Minor	Possible	Low		The Act's environmental impact assessment process provides for rigorous assessment of major projects to ensure development occurs in a sustainable manner and unacceptable impacts on values, including marine plants, do not occur.	

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
		Sustainable Ports Act	2**	Minor	Rare	Low		The Act indirectly protects marine plants by restricting port development along the GBR coast. The Act restricts capital dredging to four priority ports along the Great Barrier Reef coast (including Abbot Point) and prohibits the disposal of port-related capital dredge material within a restricted area (i.e., within the Great Barrier Reef World Heritage Area but outside the Commonwealth GBR marine park), which assists in safeguarding marine plants. Prohibits development relating to a port facility within the State GBR marine park and within a restricted area that is outside a port's existing port limits. Mandates the master planning for priority ports adjacent to the GBR coast, which may regulate impacts on water quality not already regulated by existing legislative/planning instruments; this may include potential impacts on marine plants.	
		Vegetation Management Act / Planning Act / SDAP	1*	Minor	Unlikely	Low		The Acts require native vegetation clearing to be assessed for impacts and approved. The approval process ensures preventive and mitigation measures are implemented. SDAP State code 16: Native vegetation clearing includes performance outcomes on avoidance and mitigations of impacts, including soil erosion and watercourse sedimentation.	
		Reef 2050 Long-Term Sustainability Plan	3***	Moderate	Possible	Medium		The Plan is a policy document that requires regulatory instruments such as Acts, Regulations or local planning schemes to make its provisions enforceable. The Plan commits Queensland to advancing the preparation of master plans for priority ports to ensure the environmental values of the GBRWHA are managed; commits to limiting port-related capital dredging in priority ports and beneficial reuse of dredge spoil. Refer to Sustainable Ports Act.	

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
		State Planning Policy	1*	Minor	Unlikely	Low		The SPP is a policy document that requires regulatory instruments such as Acts, Regulations or local planning schemes to make its provisions enforceable (except assessment benchmarks). The SPP's State interest – biodiversity requires local planning schemes to integrate the avoidance and mitigation of impacts on MSES, which include marine plants. The SPP's State interest – coastal environment requires local planning schemes to integrate development outcomes such as wetland and native vegetation conservation in the coastal management district, which are known to improve quality of stormwater. It also seeks to avoid reclamation of land under tidal water, which may contribute to preserving marine plant habitat. The SPP's State interest – water quality requires local planning schemes to integrate development outcomes focused on improving the quality of stormwater. Appendix 2 sets out stormwater management design objectives for construction and post construction phases. The SPP's State interest – emissions and hazardous activities requires local planning schemes to integrate development outcomes focused on avoiding and limiting emissions from hazardous activities, including to stormwater. The SPP establishes assessment benchmarks for water quality to apply when local planning schemes do not integrate the listed policies. These apply to MCU, RoL and operational work applications.	

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
		Mackay, Isaac and Whitsunday Regional Plan	3***	Moderate	Possible	Medium		The Plan is a policy document that requires regulatory instruments such as Acts and Regulations to make its provisions enforceable. The Plan's sustainability, climate change and natural hazards DRO includes the following principle on climate change: The generation of greenhouse gases is reduced through land-use planning and development design, and long-term climate change impacts are considered in planning decisions. Relevant supporting policies seek to: - Reduce greenhouse gas emissions from vehicle usage. - Improve energy efficiency and reduction of greenhouse gases from electricity usage. - Increase access to renewable energy options and low-emission technologies. - Facilitate opportunities for carbon forestry.	
		Abbot Point State Development Area Development Scheme	1*	Minor	Unlikely	Low		SDA wide assessment criteria address water quality directly by requiring compliance with the Environmental Protection (Water) Policy 2009, by requiring avoidance of ASS and contaminated material mobilisation and by referring to engineering standards on stormwater quality and erosion. Assessment criteria apply to all proposed development in the SDA, uniformly deemed a MCU or ROL. The C-G applies the same assessment level as for development proposed under the Planning Act.	
		Transport Infrastructure Act / Land use plan / Sustainable Port Development Guidelines	1*	Moderate	Unlikely	Medium		Both the LUP and SPDG require compliance with Commonwealth and State legislation, which is triggered if impacts to marine plants can be expected from a proposed development.	
		Whitsunday Regional Council Planning Scheme - Environmental management and conservation	1*	Minor	Unlikely	Low		The Scheme's environmental management and conservation overlay code objectives include general exclusion of most forms of development; natural features, such as creeks, gullies, waterways, wetlands, flora and fauna communities, habitats, vegetation and bushland, are protected and buffered from activities in the zone and adjoining land uses. All proposed developments are assessable against the whole planning scheme, including the ASS overlay.	

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
		Whitsunday Regional Council Planning Scheme - Rural zone	1*	Minor	Unlikely	Low		The zone code allows development of a broad range of rural activities, including animal husbandry, cropping, roadside stalls and wholesale nurseries, animal keeping, aquaculture, intensive animal industry, intensive horticulture and rural industry, provided that adverse environmental and amenity impacts are avoided or appropriately managed through sensitive location, design, operation and management. The rural activities code generally applies. For the most impacting developments, the assessment must be against the full planning scheme. The rural activities code requires that off-site release of contaminants does not occur and requires no significant adverse impacts on surface or ground water resources.	
		Whitsunday Regional Council Planning Scheme - Environmental significance overlay code	1*	Minor	Unlikely	Low		The overlay code includes the following performance outcomes contribute to avoiding erosion and sedimentation: - The long-term management and maintenance of the stream protection zone. - Development of premises adjoining or containing Regulated vegetation intersecting a watercourse must not adversely affect the integrity of the riparian corridor.	
		Whitsunday Regional Council Planning Scheme - Erosion prone overlay code	1*	Minor	Unlikely	Low		Addressed in the coastal environment overlay code	
		Whitsunday Regional Council Planning Scheme - ASS overlay	1*	Minor	Unlikely	Low		The overlay code seeks to ensure development does not release acid and associated metal contaminants into the environment.	
		Whitsunday Regional Council Planning Scheme - Coastal environment overlay	1*	Minor	Unlikely	Low		The overlay code includes the performance objective for development to avoid the release of hazardous materials into floodwaters. The overlay code includes the performance objective for development to be located outside of an Erosion prone or Permanent inundation area, except in limited circumstances. It also includes the purpose to protect, conserve, rehabilitate and manage the coast, including its resources and biological diversity and the overall outcome to maintain public access to the coast (and associated performance objective).	

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
		Whitsunday Regional Council Planning Scheme - Waterways and wetlands overlay	1*	Minor	Unlikely	Low		The overlay code includes the following performance objectives: - For development to be planned and designed considering the land use constraints of the site for achieving stormwater design objectives. - For development to not discharge wastewater to a waterway or off site unless demonstrated to be best-practice environmental management for that site.. - For stormwater to not discharge directly to a non-tidal artificial waterway without treatment to achieve stormwater quality management -for construction activities to avoid or minimise adverse impacts on stormwater quality - For wastewater discharge to a waterway to be managed in a way that maintains ecological processes, riparian vegetation, waterway integrity and downstream ecosystem health. The overlay code also prescribes stormwater management design objectives for construction and post construction.	

1.4 Coral reefs

Table 7 Initial risk

Key: OUV: Outstanding Universal Value; C: Consequence; L: Likelihood

Risk Description			Initial Risk		
OUV (Y/N)	Potential impacts, threats or pressures	Development activities	C	L	Original risk
Y Cvii, Cviii, Cix, Cx - Min	Development of port infrastructure and removal or placement of material in the marine environment (such as through reclamation, dredging and dredge material placement) resulting in direct loss of coral reefs and coral habitat, and reduction of habitat quality in adjacent areas due to altered coastal processes and including altered sediment transport. Elevated sediment, nutrient and contaminant loads in water due to stormwater runoff and emissions/discharges from construction and operational activities (including reclamation and dredging) causing a decline in quality or loss of coral reef and coral habitat. Elevation of sea surface temperature and increasing ocean acidification due to climate change resulting in degradation or loss of coral reef and coral habitat.	Special development (highest level of impact)	Moderate	Possible	Medium
		High/medium impact development	Minor	Unlikely	Low
		Low impact development	Minor	Rare	Low

Table 8 Post management risk

Key: OUV: Outstanding Universal Value; C: Consequence; L: Likelihood; MM applic.: Management measure application; PM risk: Post-management risk

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
Y Cvii, Cviii, Cix, Cx - Min	Development of port infrastructure and removal or placement of material in the marine environment (such as through reclamation, dredging and dredge material placement) resulting in direct loss of coral reefs and coral habitat, and reduction of habitat quality in adjacent areas due to altered coastal processes and including altered sediment transport. Elevated sediment, nutrient and contaminant loads in water due to stormwater runoff and emissions/discharges from construction and operational activities (including reclamation and dredging) causing a decline in quality or loss of coral reef and coral habitat. Elevation of sea surface temperature and increasing ocean acidification due to climate change resulting in degradation or loss of coral reef and coral habitat.	Sea Dumping Act	1*	Minor	Unlikely	Low	Medium	The Act regulates the offshore disposal of dredge material, one of the aims being to avoid disposal in sensitive areas (e.g., coral reefs) and limit turbidity, including via resuspension during cyclones.	The combined application of Commonwealth, State, Local Government and port-specific instruments (as detailed in column 'Matter for consideration') to the potential impacts/threats/pressures from new development is comprehensive. However, the threats of increased ocean acidification from anthropogenic CO_2 emissions and increased water temperatures causing impacts to coral such as bleaching are not addressed under any instrument considered in the initial analysis. The post-management risk is medium due to the low quantity and relatively low importance of coral reefs within the Abbot Point study area.
		EPBC Act	2**	Minor	Possible	Low		Assessment under the Act would only address coral reefs if it was part of an assessment of impacts to a matter of national environmental significance. The Act's referral and controlled action assessment process provides for rigorous assessment where there is a potential for significant impact on a matter of national environmental significance, such as a threatened marine species that relies on coral reefs as a food source and/or habitat.	
		Great Barrier Reef Marine Park Act / GBRMP zoning plan (general use zone)	1*	Minor	Unlikely	Low		The Zoning Plan requires a permit for dredging and dumping of spoil. The permit can impose conditions aiming to avoid direct impact to coral reefs.	
		Great Barrier Reef Marine Park Act / GBRMP zoning plan (Habitat protection zone)	1*	Minor	Unlikely	Low		The Zoning Plan requires a permit for dredging and dumping of spoil. The permit can impose conditions aiming to avoid direct impact to coral reefs.	
		Coastal Protection and Management Act / Planning Act / SDAP	1*	Minor	Possible	Low		SDAP Code 8 requires that the management of dredging activities be in accordance with the National Assessment Guidelines for Dredging.	
		Environmental Protection Act / Planning Act - SDAP	1*	Minor	Possible	Low		The application process for EAs for (maintenance) dredging and mineral/bulk material handling ERAs typically requires an impact assessment that considers coral reefs. EAs for agricultural ERAs (aquaculture, intensive animal feedlotting, pig keeping, poultry farming, commercial cropping and horticulture in Great Barrier Reef catchment) located in GBR catchments can impose discharge water quality criteria.	
		Marine Parks Act / GBRCMP zoning plan (general use zone)	1*	Minor	Unlikely	Low		The Zoning Plan requires a permit for dredging and dumping of spoil. The permit can impose conditions aiming to avoid direct impact to coral reefs.	

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
		Marine Parks Act / GBRCMP zoning plan (Habitat protection zone)	1*	Minor	Unlikely	Low		The Zoning Plan requires a permit for dredging and dumping of spoil. The permit can impose conditions aiming to avoid direct impact to coral reefs.	
		State Development and Public Works Organisation Act	1*	Minor	Possible	Low		The Act's environmental impact assessment process provides for rigorous assessment of major projects to ensure development occurs in a sustainable manner and unacceptable impacts on values, including coral reefs, do not occur.	
		Sustainable Ports Act	2**	Minor	Rare	Low		The Act indirectly protects coral reefs by restricting port development along the GBR coast. The Act restricts capital dredging to four priority ports along the Great Barrier Reef coast (including Abbot Point) and prohibits the disposal of port-related capital dredge material within a restricted area (i.e., within the Great Barrier Reef World Heritage Area but outside the Commonwealth GBR marine park), which assists in safeguarding coral reefs. The Act prohibits development relating to a port facility within the State GBR marine park and within a restricted area that is outside a port's existing port limits. It also mandates the master planning for priority ports adjacent to the GBR coast, which may regulate impacts on coral reefs not already regulated by existing legislative/planning instruments.	
		Vegetation Management Act / Planning Act / SDAP	1*	Minor	Unlikely	Low		The Acts require native vegetation clearing to be assessed for impacts and approved. SDAP State code 16: Native vegetation clearing includes performance outcomes on avoidance and mitigations of impacts, including soil erosion and watercourse sedimentation.	
		Reef 2050 Long-Term Sustainability Plan	3***	Moderate	Possible	Medium		The Plan is a policy document that requires regulatory instruments such as Acts, Regulations or local planning schemes to make its provisions enforceable. The Plan commits Queensland to advancing the preparation of master plans for priority ports to ensure the environmental values of the GBRWHA are managed; commits to limiting port-related capital dredging in priority ports and beneficial reuse of dredge spoil, which contributes to limiting turbidity. Refer to Sustainable Ports Act. The Plan's associated Reef 2050 Water Quality Improvement Plan 2017-2022 establishes minimum practice standards across all industries and land uses, support to industries and communities to build a culture of innovation and stewardship that takes them beyond minimum standards, restoration of catchments through works to improve or repair riparian vegetation, streambanks, gullies, waterways and wetlands.	

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
		State Planning Policy	1*	Minor	Unlikely	Low		The SPP is a policy document that requires regulatory instruments such as Acts, Regulations or local planning schemes to make its provisions enforceable (except assessment benchmarks). The SPP's State interest – coastal environment requires local planning schemes to integrate development outcomes such as wetland and native vegetation conservation in the coastal management district, which are known to improve quality of stormwater. The SPP's State interest – water quality requires local planning schemes to integrate development outcomes focused on improving the quality of stormwater. The SPP's State interest – emissions and hazardous activities requires local planning schemes to integrate development outcomes focused on avoiding and limiting emissions from hazardous activities, including to stormwater. The SPP establishes assessment benchmarks for water quality to apply when local planning schemes do not integrate the listed policies. These apply to MCU, RoL and operational work applications.	
		Mackay, Isaac and Whitsunday Regional Plan	3***	Moderate	Possible	Medium		The Plan is a policy document that requires regulatory instruments such as Acts and Regulations to make its provisions enforceable. The Plan's environment DRO includes water quality of waterways. Sustainability, climate change and natural hazards DRO includes the following principle on climate change: The generation of greenhouse gases is reduced through land-use planning and development design, and long-term climate change impacts are considered in planning decisions. Relevant supporting policies seeks to: - Reduce greenhouse gas emissions from vehicle usage. - Improve energy efficiency and reduction of greenhouse gases from electricity usage. - Increase access to renewable energy options and low-emission technologies. - Facilitate opportunities for carbon forestry.	
		Abbot Point State Development Area Development Scheme	1*	Minor	Unlikely	Low		SDA wide assessment criteria address water quality directly by requiring compliance with the Environmental Protection (Water) Policy 2009, by requiring avoidance of ASS and contaminated material mobilisation and by referring to engineering standards on stormwater quality and erosion. Assessment criteria apply to all proposed development in the SDA, uniformly deemed a MCU or ROL. The C-G applies the same assessment level as for development proposed under the Planning Act.	
		Transport Infrastructure Act / Land use plan /	1*	Minor	Unlikely	Low		The LUP DEO ECOL. 4 states that development of port land will comply with the EPP Water. The SPDG requires compliance with State legislation, which includes the EPP	

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
		Sustainable Port Development Guidelines						Water. It requires the impact assessment to identify potential discharges to water, with estimates of both flow rates and contaminant loads for larger projects, where possible. It prohibits the discharge of pollutants into surrounding waters and the release of sediments into the surrounding environment. It requires implementation of erosion and sediment control measures. For larger projects or sites, it requires a Stormwater Management Plan as part of a Port Development Application.	
		Whitsunday Regional Council Planning Scheme - Environmental management and conservation zone	1*	Minor	Unlikely	Low		The zone code objectives include general exclusion of most forms of development; natural features, such as creeks, gullies, waterways and wetlands are protected and buffered from activities in the zone and adjoining land uses. All proposed developments are assessable against the whole planning scheme, including the ASS and waterways/wetlands overlays.	
		Whitsunday Regional Council Planning Scheme - Rural zone	1*	Minor	Possible	Low		The zone code allows development of a broad range of Rural activities, including animal husbandry, cropping, roadside stalls and wholesale nurseries, animal keeping, aquaculture, intensive animal industry, intensive horticulture and rural industry, provided that adverse environmental and amenity impacts are avoided or appropriately managed through sensitive location, design, operation and management. The rural activities code generally applies. For the most impacting developments, the assessment must be against the full planning scheme. The rural activities code requires that off-site release of contaminants does not occur and requires no significant adverse impacts on surface water.	
		Whitsunday Regional Council Planning Scheme - Environmental significance overlay code	1*	Minor	Unlikely	Low		The overlay code includes the following performance outcomes that contribute to avoiding erosion and sedimentation: - The long-term management and maintenance of the stream protection zone. - Development of premises adjoining or containing Regulated vegetation intersecting a watercourse must not adversely affect the integrity of the riparian corridor.	
		Whitsunday Regional Council Planning Scheme - Erosion prone overlay code	1*	Minor	Unlikely	Low		Addressed in the coastal environment overlay code.	
		Whitsunday Regional Council Planning Scheme - ASS overlay code	1*	Minor	Unlikely	Low		The overlay code seeks to ensure development does not release acid and associated metal contaminants into the environment.	

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
		Whitsunday Regional Council Planning Scheme - Coastal environment overlay code	1*	Minor	Unlikely	Low		The overlay code includes the performance objective for development to avoid the release of hazardous materials into floodwaters. It includes the performance objective for development to be located outside of an Erosion prone or Permanent inundation area, except in limited circumstances.	
		Whitsunday Regional Council Planning Scheme - Waterways and wetlands overlay code	1*	Minor	Unlikely	Low		The overlay code includes the following performance objectives: - For development to be planned and designed considering the land use constraints of the site for achieving stormwater design objectives. - For development to not discharge wastewater to a waterway or off site unless demonstrated to be best-practice environmental management for that site. - For stormwater to not discharge directly to a non-tidal artificial waterway without treatment to achieve stormwater quality management. - For construction activities to avoid or minimise adverse impacts on stormwater quality. - For wastewater discharge to a waterway to be managed in a way that maintains ecological processes, riparian vegetation, waterway integrity and downstream ecosystem health. It also prescribes stormwater management design objectives for construction and post construction.	

1.5 Fish, Fish Habitat Areas

Table 9 Initial risk

Key: OUV: Outstanding Universal Value; C: Consequence; L: Likelihood

Risk Description			Initial Risk		
OUV (Y/N)	Potential impacts, threats or pressures	Development activities	C	L	Original risk
Y Cvii, Cix - Min	Development of port infrastructure and removal or placement of material in the marine environment (such as through reclamation, dredging and dredge material placement) resulting in mortality or injury of fish, direct loss of fish habitat and reduction of habitat quality in adjacent areas due to altered coastal processes, including erosion and accretion of sediments. Elevated sediment, nutrient and contaminant loads in water due to stormwater runoff and emissions/discharges from construction and operational activities (including reclamation and dredging) causing a decline in quality or loss of fish habitat, including breeding and feeding habitat. Onshore development activities within and across watercourses, including for linear infrastructure, resulting in direct loss of habitat and obstruction or diminishment of fish passage.	Special development (highest level of impact)	Moderate	Possible	Medium
		High/medium impact development	Minor	Possible	Low
		Low impact development	Minor	Unlikely	Low

Table 10 Post management risk

Key: OUV: Outstanding Universal Value; C: Consequence; L: Likelihood; MM applic.: Management measure application; PM risk: Post-management risk

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
Y Cvii, Cix - Min	Development of port infrastructure and removal or placement of material in the marine environment (such as through reclamation, dredging and dredge material placement) resulting in mortality or injury of fish, direct loss of fish habitat and reduction of habitat quality in adjacent areas due to altered coastal processes, including erosion and accretion of sediments. Elevated sediment, nutrient and contaminant loads in water due to stormwater runoff and emissions/discharges from construction and operational activities (including reclamation and dredging) causing a decline in quality or loss of fish habitat, including breeding and feeding habitat. Onshore development activities within and across watercourses, including for linear infrastructure, resulting in direct loss of habitat and obstruction or diminishment of fish passage.	Sea Dumping Act	1*	Minor	Unlikely	Low	Low	The Act regulates the offshore disposal of dredge material, one of the aims being to limit turbidity.	The combined application of Commonwealth, State, Local Government and port-specific instruments (as detailed in column 'Matter for consideration') to the potential impacts/threats/pressures from new development is comprehensive.
		EPBC Act	1*	Minor	Possible	Low		The Act's referral and controlled action assessment process provides for rigorous assessment where there is a potential for significant impact on a matter of national environmental significance, such as a threatened fish species.	
		Great Barrier Reef Marine Park Act / GBRMP zoning plan (general use zone)	1*	Minor	Unlikely	Low		The Zoning Plan requires a permit for dredging, dumping of spoil, harbour works and reclamation. The permit can impose conditions aiming to limit turbidity from these activities and to salvage fish trapped within reclamation area bund walls.	
		Great Barrier Reef Marine Park Act / GBRMP zoning plan (Habitat protection zone)	1*	Minor	Unlikely	Low		The Zoning Plan requires a permit for dredging, dumping of spoil and harbour works. The permit can impose conditions aiming to limit turbidity from these activities and to salvage fish trapped within reclamation area bund walls.	
		Protection of the Sea (prevention of Pollution from Ships) Act	1*	Minor	Unlikely	Low		The Act prohibits the discharge of oil, noxious substances, packaged harmful substances, sewage and garbage from vessels in Australian waters, thereby safeguarding water quality.	
		Coastal Protection and Management Act / Planning Act / SDAP	1*	Minor	Possible	Low		Tidal works proponents are required to assess the proposed development impact on marine plants. The Planning Act establishes the approval triggers and SDAP State Code 8 sets out the performance outcomes to be met. SDAP Code 8 also requires the management of dredging activities in accordance with the National Assessment Guidelines for Dredging.	
		Environmental Protection Act / Planning Act - SDAP	1*	Minor	Possible	Low		EAs for dredging ERA impose water quality criteria for project proponents to meet. Environmental Authorities for ERAs addressing coal stockpiling/handling can place limits on coal dust deposition rates.	
		Environmental Offsets Act	2**	Minor	Possible	Low		The Act does not prevent environmental impacts from development but rather mitigates such impacts through offsets. The Act requires offsetting of lost marine plants and threatened fish species (MNES) when a significant residual impact is demonstrated.	

Risk Description		Risk Treatment Plan and Post Management Risk						
		Fisheries Act / Planning Act / SDAP	1*	Minor	Rare	Low		The Act requires direct and indirect impacts to marine plants to be assessed as part of development proposals and requires mitigation measures to be implemented. The Planning Act establishes the approval triggers and SDAP State code 11: Removal, destruction or damage of marine plants sets out the performance outcomes to be met. It establishes a permitting system for works that may constitute waterway barrier works hindering fish passage in waterways. Operational work for waterway barrier works is accepted development under the Planning Regulation subject to conditions that regulate the activity.
		Marine Parks Act / GBRCMP zoning plan (general use zone)	1*	Minor	Unlikely	Low		The Zoning Plan requires a permit for dredging, dumping of spoil, harbour works and reclamation. The permit can impose conditions aiming to limit turbidity from these activities and to salvage fish trapped within reclamation area bund walls.
		Marine Parks Act / GBRCMP zoning plan (Habitat protection zone)	1*	Minor	Unlikely	Low		The Zoning Plan requires a permit for dredging, dumping of spoil and harbour works. The permit can impose conditions aiming to limit turbidity from these activities and to salvage fish trapped within reclamation area bund walls.
		State Development and Public Works Organisation Act	1*	Minor	Possible	Low		The Act's environmental impact assessment process provides for rigorous assessment of major projects to ensure development occurs in a sustainable manner and unacceptable impacts on values, including fish and their habitat, do not occur. For instance, it can require the development of management measures to prevent entrapment of marine fauna in reclamation areas and their salvage from within the bund wall.
		Sustainable Ports Act	2**	Minor	Rare	Low		The Act indirectly protects fish and fish habitat areas by restricting port development along the GBR coast. The Act restricts capital dredging to four priority ports along the Great Barrier Reef coast (including Abbot Point) and prohibits the disposal of port-related capital dredge material within the Great Barrier Reef World Heritage Area, which assists in limiting turbidity. It prohibits development relating to a port facility within the State GBR marine park and within a restricted area that is outside a port's existing port limits, which limits the risk of marine plant removal. It also mandates the master planning for priority ports adjacent to the GBR coast, which may regulate impacts on fish or their habitat not already regulated by existing legislative/planning instruments.
		Transport Operations (Marine Pollution) Act	1*	Minor	Unlikely	Low		The Act prohibits the discharge of ship-sourced pollutants including oils, chemicals, sewage and garbage into coastal waters.

Risk Description		Risk Treatment Plan and Post Management Risk						
		Vegetation Management Act / Planning Act / SDAP	1*	Minor	Unlikely	Low		The Acts require native vegetation clearing to be assessed for impacts and approved. SDAP State code 16: Native vegetation clearing includes performance outcomes on avoidance and mitigations of impacts, including soil erosion and watercourse sedimentation.
		Water Act / Planning Act - SDAP	1*	Minor	Possible	Low		The Act's Riverine Protection Permit for works within the banks of watercourses seeks to prevent bank destabilisation that would lead to erosion and water sedimentation. Exemptions apply.
		Reef 2050 Long-Term Sustainability Plan	3***	Moderate	Possible	Medium		The Plan is a policy document that requires regulatory instruments such as Acts, Regulations or local planning schemes to make its provisions enforceable. The Plan commits Queensland to advancing the preparation of master plans for priority ports to ensure the environmental values of the GBRWHA are managed; commits to limiting port-related capital dredging in priority ports and beneficial reuse of dredge spoil, which contributes to limiting turbidity. Refer to Sustainable Ports Act. The Plan's associated Reef 2050 Water Quality Improvement Plan 2017-2022 establishes minimum practice standards across all industries and land uses, support to industries and communities to build a culture of innovation and stewardship that takes them beyond minimum standards, restoration of catchments through works to improve or repair riparian vegetation, streambanks, gullies, waterways and wetlands.
		State Planning Policy	1*	Minor	Unlikely	Low		The SPP is a policy document that requires regulatory instruments such as Acts, Regulations or local planning schemes to make its provisions enforceable (except assessment benchmarks). The SPP's State interest – coastal environment requires local planning schemes to integrate development outcomes such as wetland and native vegetation conservation in the coastal management district, which are known to improve quality of stormwater. The SPP's State interest – water quality requires local planning schemes to integrate development outcomes focused on improving the quality of stormwater. Appendix 2 sets out stormwater management design objectives for construction and post construction phases. The SPP's State interest – emissions and hazardous activities requires local planning schemes to integrate development outcomes focused on avoiding and limiting emissions from hazardous activities, including to stormwater. The SPP establishes assessment benchmarks for water quality to apply when local planning schemes do not integrate the listed policies. These apply to MCU, RoL and operational work applications.
		Mackay, Isaac and Whitsunday Regional Plan	3***	Moderate	Possible	Medium		The Plan is a policy document that requires regulatory instruments such as Acts and Regulations to make its provisions enforceable.

Risk Description		Risk Treatment Plan and Post Management Risk						
								The Plan's Environment DRO includes water quality of waterways.
		Abbot Point State Development Area Development Scheme	1*	Minor	Unlikely	Low		SDA wide assessment criteria address water quality directly by requiring compliance with the Environmental Protection (Water) Policy 2009, by requiring avoidance of ASS and contaminated material mobilisation and by referring to engineering standards on stormwater quality and erosion. Assessment criteria apply to all proposed development in the SDA, uniformly deemed a MCU or ROL. The C-G applies the same assessment level as for development proposed under the Planning Act.
		Transport Infrastructure Act / Land use plan / Sustainable Port Development Guidelines	1*	Minor	Unlikely	Low		The LUP DEO ECOL. 4 states that development of port land will comply with the EPP Water. The SPDG requires compliance with State legislation, which includes the EPP Water. It requires the impact assessment to identify potential discharges to water, with estimates of both flow rates and contaminant loads for larger projects, where possible. It prohibits the discharge of pollutants into surrounding waters and the release of sediments into the surrounding environment. It requires implementation of erosion and sediment control measures. For larger projects or sites, it requires a Stormwater Management Plan as part of a Port Development Application.
		Whitsunday Regional Council Planning Scheme - Environmental management and conservation zone	1*	Minor	Unlikely	Low		The zone code objectives include general exclusion of most forms of development; natural features, such as creeks, gullies, waterways and wetlands are protected and buffered from activities in the zone and adjoining land uses. All proposed developments are assessable against the whole planning scheme, including the ASS and waterways/wetlands overlays.
		Whitsunday Regional Council Planning Scheme - Rural zone	1*	Minor	Unlikely	Low		The zone code allows development of a broad range of Rural activities, including animal husbandry, cropping, roadside stalls and wholesale nurseries, animal keeping, aquaculture, intensive animal industry, intensive horticulture and rural industry, provided that adverse environmental and amenity impacts are avoided or appropriately managed through sensitive location, design, operation and management. The rural activities code generally applies. For the most impacting developments, the assessment must be against the full planning scheme. The rural activities code requires that off-site release of contaminants does not occur and requires no significant adverse impacts on surface water.
		Whitsunday Regional Council Planning Scheme - Environmental significance overlay code	1*	Minor	Unlikely	Low		The overlay code includes the following performance outcomes, which contribute to avoiding erosion and sedimentation: - The long-term management and maintenance of the stream protection zone. - Development of premises adjoining or containing Regulated vegetation intersecting a watercourse must not adversely affect the integrity of the riparian corridor.

Risk Description		Risk Treatment Plan and Post Management Risk							
		Whitsunday Regional Council Planning Scheme - Erosion prone overlay code	1*	Minor	Unlikely	Low		Addressed in the coastal environment overlay code.	
		Whitsunday Regional Council Planning Scheme - ASS overlay code	1*	Minor	Unlikely	Low		The overlay code seeks to ensure development does not release acid and associated metal contaminants into the environment.	
		Whitsunday Regional Council Planning Scheme - Coastal environment overlay code	1*	Minor	Unlikely	Low		The overlay code includes the performance objective for development to avoid the release of hazardous materials into floodwaters. It includes the performance objective for development to be located outside of an Erosion prone or Permanent inundation area, except in limited circumstances.	
		Whitsunday Regional Council Planning Scheme - Waterways and wetlands overlay code	1*	Minor	Unlikely	Low		The overlay code includes the following performance objectives: - For development to be planned and designed considering the land use constraints of the site for achieving stormwater design objectives. - For development to not discharge wastewater to a waterway or off site unless demonstrated to be best-practice environmental management for that site. - For stormwater to not discharge directly to a non-tidal artificial waterway without treatment to achieve stormwater quality management. - For construction activities to avoid or minimise adverse impacts on stormwater quality. - For wastewater discharge to a waterway to be managed in a way that maintains ecological processes, riparian vegetation, waterway integrity and downstream ecosystem health. It also prescribes stormwater management design objectives for construction and post construction.	

1.6 Marine reptiles, marine mammals and migratory marine species

Table 11 Initial risk

Key: OUV: Outstanding Universal Value; C: Consequence; L: Likelihood

Risk Description			Initial Risk		
OUV (Y/N)	Potential impacts, threats or pressures	Development activities	C	L	Original risk
Y Cvii, Cx - Min	Development of port infrastructure and removal or placement of material in the marine environment (such as through reclamation, dredging and dredge material placement) resulting in mortality or injury of fauna (such as through vessel strike), direct loss of habitat, and reduction of habitat quality in adjacent areas due to altered coastal processes including altered sediment transport. Elevated sediment, nutrient and contaminant loads in water due to stormwater runoff and emissions/discharges from construction and operational activities (including reclamation and dredging) causing a decline in quality or loss of habitat. Elevated levels of noise, vibration and lighting associated with construction and operational activities resulting in a reduction of habitat quality affecting fauna behaviour (such as migratory routes, breeding and feeding activity) and leading to elevated stress or mortality.	Special development (highest level of impact)	Moderate	Likely	Medium
		High/medium impact development	Minor	Possible	Low
		Low impact development	Minor	Unlikely	Low

Table 12 Post management risk

Key: OUV: Outstanding Universal Value; C: Consequence; L: Likelihood; MM applic.: Management measure application; PM risk: Post-management risk

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
Y Cvii, Cx - Min	Development of port infrastructure and removal or placement of material in the marine environment (such as through reclamation, dredging and dredge material placement) resulting in mortality or injury of fauna (such as through vessel strike), direct loss of habitat, and reduction of habitat quality in adjacent areas due to altered coastal processes including altered sediment transport. Elevated sediment, nutrient and contaminant loads in water due to stormwater runoff and emissions/discharges from construction and operational activities (including reclamation and dredging) causing a decline in quality or loss of habitat. Elevated levels of noise, vibration and lighting associated with construction and operational activities resulting in a reduction of habitat quality affecting fauna behaviour (such as migratory routes, breeding and feeding activity) and leading to elevated stress or mortality.	Sea Dumping Act	1*	Minor	Possible	Low	Low	The Act's sea dumping permits regulate dredge material disposal activities, including sources of disturbances to marine megafauna.	The combined application of Commonwealth, State, Local Government and port-specific instruments (as detailed in column 'Matter for consideration') to the potential impacts/threats/pressures from new development is comprehensive.
		EPBC Act	1*	Minor	Possible	Low		The Act's referral and controlled action assessment process provides for rigorous assessment where there is a potential for significant impact on a matter of national environmental significance, such as a threatened marine species, including turtles.	
		Great Barrier Reef Marine Park Act / GBRMP zoning plan (general use zone)	1*	Minor	Unlikely	Low		The Zoning Plan requires a permit for dredging, dumping of spoil and harbour works. The permit can impose conditions aiming to limit noise/vibration/lighting impacts on marine megafauna from these activities.	
		Great Barrier Reef Marine Park Act / GBRMP zoning plan (Habitat protection zone)	1*	Minor	Unlikely	Low		The Zoning Plan requires a permit for dredging, dumping of spoil and harbour works. The permit can impose conditions aiming to limit noise/vibration/lighting impacts on marine megafauna from these activities.	
		Coastal Protection and Management Act / Planning Act / SDAP	1*	Minor	Possible	Low		Under SDAP State Code 8: - Development in erosion-prone areas is restricted, which indirectly limits edge effects and impacts on beaches where turtles may be nesting. - Development is required to be as far landward as possible, which indirectly limits edge effects and impacts on beaches where turtles may be nesting. - Development must avoid, minimise and offset impacts on matters of state environmental significance (includes marine reptiles, mammals and migratory species).	
		Environmental Protection Act / Planning Act - SDAP	1*	Minor	Rare	Low		EAs for dredging ERA impose noise management measures to prevent impact on marine megafauna. SDAP Code 22 includes performance outcome requiring development to avoid, minimise and mitigate impacts on matters of state environmental significance, which includes marine megafauna. Only applies to development reaching ERA thresholds.	
		Environmental Offsets Act	2**	Minor	Possible	Low		The Act does not prevent environmental impacts from development but rather mitigates such impacts through offsets.	

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
								The Act requires the offsetting of lost marine megafauna species when a significant residual impact is demonstrated.	
		Marine Parks Act / GBRCMP zoning plan (general use zone)	1*	Minor	Unlikely	Low		The Zoning Plan requires a permit for dredging, dumping of spoil and harbour works. The permit can impose conditions aiming to limit noise/vibration/lighting impacts on marine megafauna from these activities.	
		Marine Parks Act / GBRCMP zoning plan (Habitat protection zone)	1*	Minor	Unlikely	Low		The Zoning Plan requires a permit for dredging, dumping of spoil and harbour works. The permit can impose conditions aiming to limit noise/vibration/lighting impacts on marine megafauna from these activities.	
		Nature Conservation Act	1*	Minor	Possible	Low		The Act lists marine megafauna species as threatened wildlife, which leads to their protection as MSES.	
		State Development and Public Works Organisation Act	1*	Minor	Possible	Low		The Act's environmental impact assessment process provides for rigorous assessment of major projects to ensure development occurs in a sustainable manner and unacceptable impacts on values, including marine megafauna, do not occur. For instance, it can require the development of management measures to prevent impacts to marine megafauna.	
		Sustainable Ports Act	2**	Minor	Rare	Low		The Act indirectly protects marine reptiles, mammals and migratory species by restricting port development along the GBR coast. The Act restricts capital dredging to four major ports along the Great Barrier Reef coast (including Abbot Point), which prevents the multiplication of sites where marine megafauna could be impacted.	
		Reef 2050 Long-Term Sustainability Plan	3***	Moderate	Likely	Medium		The Plan is a policy document that requires regulatory instruments such as Acts, Regulations or local planning schemes to make its provisions enforceable. The Plan sets objectives and targets aiming for populations increase. Actions include: - Implementation of the associated Queensland turtle strategy. - Development of a guideline specific to the GBR on assessing and managing impacts of underwater noise on species.	
		Transport Infrastructure Act / Land use plan / Sustainable Port	1*	Minor	Possible	Low		The SPDG includes the objective for works to be undertaken to minimise potential environmental impacts and protect environmental values of the marine environment. Specific requirements include: - Development on land adjoining an area of high ecological value shall	

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
		Development Guidelines						include appropriate measures to protect the area, such as setbacks, landscaped buffers, stormwater quality, light spill and noise management to minimise adverse impacts on these areas. - Addressing marine environmental values as documented in NQBP's Port Environmental Management Plan as a minimum and achieve the outcomes sought in the document through appropriate environmental controls. - CEMP and OEMP - CEMP focus areas listed include pile driving (for noise and vibration impacts) and OEMP focus areas listed include noise and light. -Both CEMP and OEMP must include an environmental monitoring and reporting program. The SPDG requires cumulative impacts to be evaluated, which is relevant to noise/vibration/lighting a proposed development will emit in addition to pre-existing emissions.	
		Whitsunday Regional Council Planning Scheme - Environmental management and conservation zone	1*	Minor	Unlikely	Low		The Scheme's objectives include general exclusion of most forms of development; natural features, such as creeks, gullies, waterways and wetlands are protected and buffered from activities in the zone and adjoining land uses. All proposed developments are assessable against the whole planning scheme, including the coastal environment, ASS and waterways/wetlands overlays.	
		Whitsunday Regional Council Planning Scheme - Environmental significance overlay code	1*	Minor	Unlikely	Low		The overlay code includes the following overall outcomes, which contribute to avoiding encroachment of development on turtle nesting areas: - Development protects and establishes appropriate buffers to significant fauna habitat. - Development protects known populations and supporting habitat of MNES and EVNT fauna species under the Nature Conservation Act (both categories include turtles).	
		Whitsunday Regional Council Planning Scheme - Erosion prone overlay code	1*	Minor	Unlikely	Low		Addressed in the coastal environment overlay code	
		Whitsunday Regional Council Planning Scheme - Coastal environment overlay code	2**	Minor	Likely	Low		The overlay code includes the following overall outcome, which contributes to avoiding encroachment on turtle nesting areas: wherever possible, development within a Coastal hazard area avoids intensification of existing uses, new permanent built structures and seaward extensions to existing built structures. This overall outcome is supported by the following performance outcome:	

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
								- Except in limited circumstances, development is located outside of an erosion prone area (includes beaches where turtles may be nesting).	

2 Land Values

2.1 Terrestrial vegetation communities and ecosystems

Table 13 Initial risk

Key: OUV: Outstanding Universal Value; C: Consequence; L: Likelihood

Risk Description			Initial Risk		
OUV (Y/N)	Potential impacts, threats or pressures	Development activities	C	L	Original risk
Y Cx, Cvii - Min	Vegetation clearing resulting in direct loss of vegetation communities and ecosystems and reduction of habitat quality in remaining areas due to edge effects (including through increased availability of access) that reduce extent, condition and quality of communities and ecosystems. Elevated sediment, nutrient and contaminant loads in water due to stormwater runoff and emissions/discharges from construction and operational activities (including onshore dredge material placement) causing a decline in quality or loss of habitat. Modification to surface water and groundwater resources (including altered flow paths and water availability) due to construction and operational activities such as earthworks causing a decline in quality or loss of habitat. Increased weed and pest pressure on terrestrial vegetation communities and ecosystems due to construction and operational activities, including through increased availability of access.	Special development (highest level of impact)	Major	Likely	High
		High/medium impact development	Moderate	Likely	Medium
		Low impact development	Minor	Possible	Low

Table 14 Post management risk

Key: OUV: Outstanding Universal Value; C: Consequence; L: Likelihood; MM applic.: Management measure application; PM risk: Post-management risk

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
Y Cx, Cvii - Min	Vegetation clearing resulting in direct loss of vegetation communities and ecosystems and reduction of habitat quality in remaining areas due to edge effects (including through increased availability of access) that reduce extent, condition and quality of communities and ecosystems. Elevated sediment, nutrient and contaminant loads in water due to stormwater runoff and emissions/discharges from construction and operational activities (including onshore dredge material placement) causing a decline in quality or loss of habitat. Modification to surface water and groundwater resources (including altered flow paths and water availability) due to construction and operational activities such as earthworks causing a decline in quality or loss of habitat. Increased weed and pest pressure on terrestrial vegetation communities and ecosystems due to construction and operational activities, including through increased availability of access.	Biosecurity Act (Cwth)	1*	Minor	Possible	Low	Low	The Act aims to prevent the introduction of weeds and pests that may cause harm to native flora. The Act has a broader focus than the listed threat.	The combined application of Commonwealth, State, Local Government and port-specific instruments (as detailed in column 'Matter for consideration') to the potential impacts/threats/pressures from new development is comprehensive.
		EPBC Act	1*	Minor	Possible	Low		The Act's referral and controlled action assessment process provides for rigorous assessment where there is a potential significant impact on a matter of national environmental significance, such as listed threatened flora species and TECs. Significant residual impacts are required to be offset.	
		Biosecurity Act (Qld)	1*	Minor	Possible	Low		The Act establishes a 'general biosecurity obligation' that requires all persons to take all reasonable and practical steps to prevent or minimise biosecurity risks. The Biosecurity Regulation 2016 identifies prohibited matter that should not be present in Queensland, restricted matter for which movement control is prescribed and restricted places that pose biosecurity risks.	
		Environmental Protection Act / Planning Act - SDAP	1*	Minor	Possible	Low		The Acts approval process of EAs for land-based ERAs involves an assessment of impacts to remnant vegetation (categorised as Environmental Sensitive Areas - ESAs). Remnant vegetation clearing can be prohibited or subject to approval in particular ESA categories depending on their sensitivity. Approved clearing that is a significant residual impact must be offset under the Environmental Offset Act. SDAP Code 22 includes performance outcome requiring development to avoid, minimise and mitigate impacts on matters of state environmental significance, which includes endangered and of concern regional ecosystems. Only applies to development reaching ERA thresholds.	
		Environmental Offsets Act	2**	Minor	Possible	Low		The Act does not prevent environmental impacts from development but rather mitigates such impacts through offsets. The Act requires the offsetting of significant residual impact to MSES (includes endangered and of concern regional ecosystem) is demonstrated.	
		Nature Conservation Act	1*	Minor	Possible	Low		The Act lists specific EVNT species for which clearing is subject to a protected plant clearing permit. Clearing requires to be offset under the Environmental Offset Act.	

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
		State Development and Public Works Organisation Act	1*	Minor	Possible	Low		The Act's environmental impact assessment process provides for rigorous assessment of major projects to ensure development occurs in a sustainable manner and unacceptable impacts on values, including remnant vegetation, do not occur. Vegetation clearing approvals under the relevant legislation are still required post-EIS.	
		Vegetation Management Act / Planning Act / SDAP	1*	Minor	Unlikely	Low		The Act outlines that approval process for development involving interference with remnant vegetation involves an assessment of impacts to regional ecosystems. Clearing of all regional ecosystems (except least concern) requires approval. Approved clearing that constitutes a significant residual impact must be offset under the Environmental Offset Act. SDAP Code 16 specifies detailed performance outcomes and acceptable outcomes for various clearing types and locations. Sediment runoff is addressed as part of the clearing approval process: SDAP includes requirements for erosion prevention generally as well as in wetlands, watercourse and drainage features. Approval conditions typically include requirements to prevent erosion and waterway sedimentation. Operational work for clearing of native vegetation is accepted development only if the work complies with a vegetation clearing code.	
		Water Act / Planning Act - SDAP	1*	Minor	Possible	Low		The Act's Riverine Protection Permit for works within the banks of watercourses seeks to prevent bank destabilisation that would lead to erosion and water sedimentation. Exemptions apply if the proponent is subject to other approvals that address impacts to waterways.	
		Reef 2050 Long-Term Sustainability Plan	3***	Moderate	Possible	Medium		The Plan is a policy document that requires regulatory instruments such as Acts, Regulations or local planning schemes to make its provisions enforceable. The Plan's associated Reef 2050 Water Quality Improvement Plan 2017-2022 establishes minimum practice standards across all industries and land uses, support to industries and communities to build a culture of innovation and stewardship that takes them beyond minimum standards, restoration of catchments through works to improve or repair riparian vegetation, streambanks, gullies, waterways and wetlands.	
		State Planning Policy	1*	Minor	Unlikely	Low		The SPP is a policy document that requires regulatory instruments such as Acts, Regulations or local planning schemes to make its provisions enforceable (except assessment benchmarks). The SPP's State interest – biodiversity requires local planning schemes to integrate development outcomes seeking to avoid or minimise impacts to MNES, MSES and MLES, which includes vegetation.	

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
								The SPP's State interest – coastal environment requires local planning schemes to integrate development outcomes such as native vegetation conservation in the coastal management district. The SPP's State interest – water quality requires local planning schemes to integrate development outcomes seeking to: - Locate zones for urban purposes so as to avoid disturbance of high risk soils and natural drainage lines. - Plan development to avoid or minimise adverse impacts on environmental values of receiving waters arising from altered stormwater hydrology. Appendix 2 sets out stormwater management design objectives for construction and post construction phases, which addresses drainage and erosion.	
		Mackay, Isaac and Whitsunday Regional Plan	3***	Minor	Likely	Low		The Plan is a policy document that requires regulatory instruments such as Acts and Regulations to make its provisions enforceable. The Plan's DRO Environment includes a policy for development in non-urban areas to maintain the integrity of areas with significant biodiversity values. Supporting programs include: - Identification, rehabilitation and management of local and regional biodiversity networks through coordination mechanisms, in partnership with private and public landholders. - Pest and disease control programs to protect areas with significant biodiversity values. - Prevent and monitor exposure to exotic and introduced pests, weeds and diseases in the region, through the combined efforts of government, industry and landholders.	
		Abbot Point State Development Area Development Scheme	1*	Minor	Unlikely	Low		SDA wide assessment criteria do not specifically address vegetation clearing or weed management. However, the C-G and referral agencies apply the same assessment as for development proposed under the Planning Act, thereby applying the same level of regulation to vegetation clearing.	
		Transport Infrastructure Act / Land use plan / Sustainable Port Development Guidelines	1*	Minor	Possible	Low		Development in areas mapped as Environmental Protection under the LUP that conflict with the conservation of environmental values are stated as inappropriate. For all other precincts, the LUP requires environmental best practice to be applied. The SPDG includes the following specific requirements: - Proponents' impact assessment must detail any proposed flora removal required, and address the environmental values of this flora and impacts of the proposed disturbance.	

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
								- Approvals under State legislation (i.e. Vegetation Management Act, Nature Conservation Act) must be obtained where relevant.	
		Whitsunday Regional Council Planning Scheme - Environmental management and conservation zone	1*	Minor	Unlikely	Low		The zone code's objectives include general exclusion of most forms of development; natural features, such as creeks, gullies, waterways and wetlands are protected and buffered from activities in the zone and adjoining land uses. All proposed developments are assessable against the whole planning scheme.	
		Whitsunday Regional Council Planning Scheme - Rural zone	1*	Minor	Possible	Low		The zone code allows development of a broad range of rural activities, including animal husbandry, cropping, roadside stalls and wholesale nurseries, animal keeping, aquaculture, intensive animal industry, intensive horticulture and rural industry, as well as extractive activities, provided that adverse environmental impacts are avoided or appropriately managed through sensitive location, design, operation and management. The rural activities code generally applies. For the most impacting developments, the assessment must be against the whole planning scheme.	
		Whitsunday Regional Council Planning Scheme - Environmental significance overlay code	1*	Minor	Unlikely	Low		The code includes the following overall outcomes, which contribute to avoiding clearing of native vegetation: - Development protects and establishes appropriate buffers to native vegetation and significant fauna habitat. - Development protects known populations and supporting habitat of MNES, EVNT species and regulated vegetation. Assessment benchmarks support the above overall outcomes.	
		Whitsunday Regional Council Planning Scheme - Erosion prone overlay code	1*	Minor	Unlikely	Low		Addressed in the coastal environment overlay code.	
		Whitsunday Regional Council Planning Scheme - ASS overlay code	1*	Minor	Unlikely	Low		The overlay code seeks to ensure development does not release acid and associated metal contaminants into the environment.	
		Whitsunday Regional Council Planning Scheme - Waterways and	1*	Minor	Unlikely	Low		The overlay code includes the following performance outcomes: - For development to be planned and designed considering the land use constraints of the site for achieving stormwater design objectives. - For development to not discharge wastewater to a waterway or off site	

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
		wetlands overlay code						unless demonstrated to be best-practice environmental management for that site. - For stormwater to not discharge directly to a non-tidal artificial waterway without treatment to achieve stormwater quality management. - For construction activities to avoid or minimise adverse impacts on stormwater quality. - For wastewater discharge to a waterway to be managed in a way that maintains ecological processes, riparian vegetation, waterway integrity and downstream ecosystem health. It also prescribes stormwater management design objectives for construction and post construction.	
		Whitsunday Regional Council Planning Scheme - Excavation and filling code	1*	Minor	Unlikely	Low		The overlay code includes the following overall outcome: works are undertaken such that environmental harm and nuisance resulting from construction activities is avoided or minimised and the environmental values of water are protected. Relevant supporting performance outcomes seek to: - Protect vegetation by maintaining habitat values, preventing weed invasion and edge effects, maintaining the functioning of biodiversity corridors, maintaining the ecological health of riparian corridors, waterways and wetlands and preventing the loss of soil resources. - Prevent the worsening effect on natural stormwater flows within the site.	
		Whitsunday Regional Council Planning Scheme - Construction management code	1*	Minor	Unlikely	Low		The overlay code includes the following overall outcome: excavation and filling does not adversely or unreasonably impact on the natural environment, drainage conditions or adjacent properties. Supporting performance outcomes are as follows: - Excavation and filling does not cause environmental harm. - Filling or excavation does not interfere with natural stormwater flows.	

2.2 Listed threatened and migratory species

Table 15 Initial risk

Key: OUV: Outstanding Universal Value; C: Consequence; L: Likelihood

Risk Description			Initial Risk		
OUV (Y/N)	Potential impacts, threats or pressures	Development activities	C	L	Original risk
Y Cvii, Cx - Sig	Vegetation clearing resulting in direct loss of threatened and migratory species and/or their habitat along with reduction of habitat quality in remaining areas due to edge effects (including through increased availability of access) that reduce extent, condition and quality of habitat. Elevated sediment, nutrient and contaminant loads in water due to stormwater runoff and emissions/discharges from construction and operational activities (including onshore dredge material placement) causing a decline in quality or loss of habitat for listed threatened and migratory species. Modification to surface water and groundwater resources (including altered flow paths and water availability) due to construction and operational activities such as earthworks causing a decline in quality or loss of habitat for listed threatened and migratory species. Injury or mortality of listed threatened and migratory species due to direct interaction with construction and operational activities (such as vehicle strike). Elevated levels of air, noise, vibration and lighting emissions associated with construction and operational activities resulting in a reduction of habitat quality, affecting species habitat and fauna behaviour (such as migratory routes, breeding and feeding activity) and leading to elevated stress or mortality. Increased weed and pest pressure on habitat for listed threatened and migratory species due to construction and operational activities, including through increased availability of access.	Special development (highest level of impact)	Major	Possible	High
		High/medium impact development	Major	Possible	High
		Low impact development	Moderate	Unlikely	Medium

Table 16 Post management risk

Key: OUV: Outstanding Universal Value; C: Consequence; L: Likelihood; MM applic.: Management measure application; PM risk: Post-management risk

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
Y Cvii, Cx - Sig	Vegetation clearing resulting in direct loss of threatened and migratory species and/or their habitat along with reduction of habitat quality in remaining areas due to edge effects (including through increased availability of access) that reduce extent, condition and quality of habitat. Elevated sediment, nutrient and contaminant loads in water due to stormwater runoff and emissions/discharges from construction and operational activities (including onshore dredge material placement) causing a decline in quality or loss of habitat for listed threatened and migratory species. Modification to surface water and groundwater resources (including altered flow paths and water availability) due to construction and operational activities such as earthworks causing a decline in quality or loss of habitat for listed threatened and migratory species. Injury or mortality of listed threatened and migratory species due to direct interaction with construction and operational activities (such as vehicle strike). Elevated levels of air, noise, vibration and lighting emissions associated with construction and operational activities resulting in a reduction of habitat quality, affecting species habitat and	EPBC Act	1*	Minor	Possible	Low	Low	The Act's referral and controlled action assessment process provides for rigorous assessment where there is a potential for significant impact on a matter of national environmental significance, such as listed threatened flora species and TECs. Significant residual impacts are required to be offset. Ecological impact assessments are typically required to consider effects of human activity on flora and fauna such as dust, light, noise and access to habitat.	The combined application of Commonwealth, State, Local Government and port-specific instruments (as detailed in column 'Matter for consideration') to the potential impacts/threats/pressures from new development is comprehensive.
		Environmental Protection Act / Planning Act - SDAP	1*	Minor	Rare	Low		The EP Act establishes the general environmental duty and the offence of causing serious or material environmental harm, which are relevant to vegetation clearing. The Act's environmental impact assessment process provides for rigorous assessment of major projects to ensure development occurs in a sustainable manner and unacceptable impacts on values, including remnant vegetation and native fauna, do not occur. The EIS process only applies if preferred by the proponent (voluntary basis) or if required by the regulator based on an assessment against the standard criteria. The approval process of EAs for land-based ERAs involves an assessment of impacts to remnant vegetation (categorised as Environmental Sensitive Areas - ESAs) and to fauna. Ecological impact assessments are required to consider effects of human activity on flora and fauna such as dust, light and noise. Approved clearing that is a significant residual impact must be offset under the Environmental Offset Act. SDAP Code 22 includes performance outcome requiring development to avoid, minimise and mitigate impacts on matters of state environmental significance, which include regional ecosystems (except Least Concern) as well as threatened wildlife and special least concern animals.	
		Environmental Offsets Act	2**	Minor	Possible	Low		The Act does not prevent environmental impacts from development but rather mitigates such impacts through offsets. The Act's requires the offsetting of significant residual impact to MSES (includes regional ecosystems, threatened wildlife and special least concern animals) is demonstrated.	

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
	fauna behaviour (such as migratory routes, breeding and feeding activity) and leading to elevated stress or mortality. Increased weed and pest pressure on habitat for listed threatened and migratory species due to construction and operational activities, including through increased availability of access.	Nature Conservation Act	1*	Minor	Possible	Low		The Act's lists specific EVNT species for which clearing is subject to a protected plant clearing permit. Clearing requires to be offset under the Environmental Offset Act.	
		State Development and Public Works Organisation Act	1*	Minor	Possible	Low		The Act's environmental impact assessment process provides for rigorous assessment of major projects to ensure development occurs in a sustainable manner and unacceptable impacts on values, including remnant vegetation and native fauna, do not occur. The ecological assessment is typically required to consider noise, lighting and risks of increased access by people to fauna habitat. Vegetation/fauna habitat clearing approvals under the relevant legislation are still required post-EIS.	
		Vegetation Management Act / Planning Act / SDAP	1*	Minor	Unlikely	Low		The Acts require native vegetation clearing to be assessed for impacts and approved. SDAP State code 16: Native vegetation clearing includes performance outcomes on avoidance and mitigations of impacts.	
		Water Act / Planning Act - SDAP	1*	Minor	Possible	Low		The Water Act's Riverine Protection Permit process for works within the banks of watercourses covers the clearing of vegetation.	
		State Planning Policy	1*	Minor	Unlikely	Low		The SPP is a policy document that requires regulatory instruments such as Acts, Regulations or local planning schemes to make its provisions enforceable (except assessment benchmarks). The SPP's State interest – water quality requires local planning schemes to integrate development outcomes focused on improving the quality of stormwater. Appendix 2 sets out stormwater management design objectives for construction and post construction phases. The SPP establishes assessment benchmarks for water quality to apply when local planning schemes do not integrate the listed policies. These apply to MCU, RoL and operational work applications.	
		Mackay, Isaac and Whitsunday Regional Plan	3***	Moderate	Possible	Medium		The Plan is a policy document that requires regulatory instruments such as Acts and Regulations to make its provisions enforceable. The Plan's DRO Environment includes the following policies: -Development in non-urban areas to maintain the integrity of areas with significant biodiversity values -In urban areas, impacts from development on areas with significant biodiversity values are offset when they cannot be avoided.	
		Abbot Point State Development Area	1*	Minor	Unlikely	Low		SDA wide assessment criteria do not specifically address vegetation clearing. However, the C-G and referral agencies apply the same	

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
		Development Scheme						assessment as for development proposed under the Planning Act, thereby regulating vegetation clearing in the same manner.	
		Transport Infrastructure Act / Land use plan / Sustainable Port Development Guidelines	1*	Minor	Unlikely	Low		Development in areas mapped as Environmental Protection under the LUP that conflict with the conservation of environmental values are stated as inappropriate. For all other precincts, the LUP requires environmental best practice to be applied. The SPDG includes the following specific requirements: - Impact assessment must detail any proposed flora removal required, and address the environmental values of this flora and impacts of the proposed disturbance. - Approvals under State legislation (i.e. Vegetation Management Act, Nature Conservation Act) must be obtained where relevant. - Development on land adjoining an area of high ecological value (e.g. areas zoned as Environmental Protection) shall include appropriate measures to protect the area (setbacks, buffers, stormwater quality, light spill and noise) to minimise adverse impacts. - CEMP and OEMP - OEMP focus areas listed include noise, light and stormwater management. Should fauna strike risks be high for a particular development, the OEMP may be required to include management measures such as speed limits or signage. The SPDG requires cumulative impacts to be evaluated, which is relevant to noise, lighting and stormwater flows a proposed development will emit in addition to pre-existing emissions.	
		Whitsunday Regional Council Planning Scheme - Rural activities code	1*	Minor	Possible	Low		The Scheme includes a performance outcome requiring intensive rural activities to be sited and designed on a lot of sufficient area to provide for adequate setbacks to waterways or wetlands. The rural activities overlay code includes a performance outcome requiring intensive rural activities to have appropriate disposal of waste and contaminants, with acceptable outcomes being to ensure that off-site release of contaminants does not occur and no significant adverse impacts on surface or ground water occurs.	
		Whitsunday Regional Council Planning Scheme - Environmental management and conservation zone	1*	Minor	Unlikely	Low		The zone code objectives include general exclusion of most forms of development; natural features, such as creeks, gullies, waterways and wetlands are protected and buffered from activities in the zone and adjoining land uses. All proposed developments are assessable against the whole planning scheme.	
		Whitsunday Regional Council Planning Scheme - Rural zone	1*	Minor	Possible	Low		The zone code allows development of a broad range of rural activities, including animal husbandry, cropping, roadside stalls and wholesale nurseries, animal keeping, aquaculture, intensive animal industry,	

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
								intensive horticulture and rural industry, as well as extractive activities, provided that adverse environmental impacts are avoided or appropriately managed through sensitive location, design, operation and management. The rural activities code generally applies. For the most impacting developments, the assessment must be against the whole planning scheme.	
		Whitsunday Regional Council Planning Scheme - Environmental significance overlay code	1*	Minor	Unlikely	Low		The overlay code includes the following overall outcomes, which contribute to preventing direct and indirect impacts on flora and fauna: - Development protects and establishes appropriate buffers to significant fauna habitat. - Development protects known populations and supporting habitat of MNES and EVNT fauna species under the Nature Conservation Act. - Development is located, designed and managed to avoid or mitigate adverse direct or indirect impacts on ecological systems and processes. - Development ensures that viable connectivity is maintained or enhanced between matters of environmental significance and biodiversity values.	
		Whitsunday Regional Council Planning Scheme - Erosion prone overlay code	1*	Minor	Unlikely	Low		Addressed in the coastal environment overlay code.	
		Whitsunday Regional Council Planning Scheme - ASS overlay code	1*	Minor	Unlikely	Low		The overlay code seeks to ensure development does not release acid and associated metal contaminants into the environment.	
		Whitsunday Regional Council Planning Scheme - Waterways and wetlands overlay code	1*	Minor	Unlikely	Low		The overlay code includes the following performance outcomes: - For development to be planned and designed considering the land use constraints of the site for achieving stormwater design objectives. - For development to not discharge wastewater to a waterway or off site unless demonstrated to be best-practice environmental management for that site. - For stormwater to not discharge directly to a non-tidal artificial waterway without treatment to achieve stormwater quality management. - For construction activities to avoid or minimise adverse impacts on stormwater quality. - For wastewater discharge to a waterway to be managed in a way that	

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
								maintains ecological processes, riparian vegetation, waterway integrity and downstream ecosystem health. It also prescribes stormwater management design objectives for construction and post construction.	
		Whitsunday Regional Council Planning Scheme - Excavation and filling code	1*	Minor	Unlikely	Low		The code includes the following overall outcome: works are undertaken such that environmental harm and nuisance resulting from construction activities is avoided or minimised and the environmental values of water are protected. Relevant supporting performance outcomes seek to: - Protect vegetation by maintaining habitat values, preventing weed invasion and edge effects, maintaining the functioning of biodiversity corridors, maintaining the ecological health of riparian corridors, waterways and wetlands and preventing the loss of soil resources. - Prevent the worsening effect on natural stormwater flows within the site.	
		Whitsunday Regional Council Planning Scheme - Construction management code	1*	Minor	Unlikely	Low		The overlay code includes the following overall outcome: excavation and filling does not adversely or unreasonably impact on the natural environment, drainage conditions or adjacent properties. Supporting performance outcomes are as follows: - Excavation and filling does not cause environmental harm. - Filling or excavation does not interfere with natural stormwater flows.	

2.3 Surface water resources

Table 17 Initial risk

Key: OUV: Outstanding Universal Value; C: Consequence; L: Likelihood

Risk Description			Initial Risk		
OUV (Y/N)	Potential impacts, threats or pressures	Development activities	C	L	Original risk
Y Cx - Sig	Stormwater runoff from development areas, including vegetation clearing, earthworks and operational activities causing elevated loads of sediment, nutrients and contaminants. Elevated sediment, nutrient and contaminant loads through construction and operational activities including onshore dredge material placement, wastewater discharge and dust emissions. Disturbance of ASS during construction and operational activities. Modification to surface water resources (including altered flow paths and water availability) due to construction and operational activities such as earthworks.	Special development (highest level of impact)	Major	Almost Certain	High
		High/medium impact development	Moderate	Almost Certain	Medium
		Low impact development	Minor	Almost Certain	Low

Table 18 Post management risk

Key: OUV: Outstanding Universal Value; C: Consequence; L: Likelihood; MM applic.: Management measure application; PM risk: Post-management risk

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
Y Cx - Sig	Stormwater runoff from development areas, including vegetation clearing, earthworks and operational activities causing elevated loads of sediment, nutrients and contaminants. Elevated sediment, nutrient and contaminant loads through construction and operational activities including onshore dredge material placement, wastewater discharge and dust emissions. Disturbance of ASS during construction and operational activities. Modification to surface water resources (including altered flow paths and water availability) due to construction and operational activities such as earthworks.	EPBC Act	1*	Minor	Possible	Low	Low	The Act's referral and controlled action assessment process provides for rigorous assessment, including impacts on freshwater quality, where there is a potential for significant impact on a matter of national environmental significance, such as listed threatened flora/fauna species and TECs. Significant residual impacts are required to be offset.	The combined application of Commonwealth, State, Local Government and port-specific instruments (as detailed in column 'Matter for consideration') to the potential impacts/threats/pressures from new development is comprehensive.
		Environmental Protection Act / Planning Act - SDAP	1*	Minor	Unlikely	Low		The EP Act establishes the general environmental duty and the offence of causing serious or material environmental harm, which are relevant to water contamination. The approval process of EAs for land-based ERAs involves an assessment of impacts to water quality (e.g., agricultural and quarrying activities). The Acts environmental impact assessment process provides for rigorous assessment of major projects to ensure development occurs in a sustainable manner and unacceptable impacts on values, including water quality, do not occur. The EIS process only applies if preferred by the proponent (voluntary basis) or if required by the regulator based on an assessment against the standard criteria. SDAP Code 22 includes performance outcome requiring development to: - Be suitably located and designed to avoid or mitigate environmental harm to the receiving waters environment. - To include elements which contain and treat hazardous contaminants on-site rather than releasing them into the environment and provide secondary containment to prevent the accidental release of hazardous contaminants. - Store hazardous materials to avoid or minimise their release into the environment during flood events.	
		State Development and Public Works Organisation Act	1*	Minor	Possible	Low		The Act's environmental impact assessment process provides for rigorous assessment of major projects to ensure development occurs in a sustainable manner and unacceptable impacts on values, including water quality, do not occur.	
		Vegetation Management Act / Planning Act / SDAP	1*	Minor	Unlikely	Low		SDAP Code 16 includes the following performance outcomes: - Clearing maintains natural wetland and watercourse/drainage feature vegetation to protect bank stability by protecting against bank erosion, water quality by filtering sediments, nutrients and other pollutants. - Clearing does not result in accelerated soil erosion within or outside the land the subject of the development application. - Clearing does not contribute to or accelerate land degradation through	

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
								waterlogging, or through the salinisation of groundwater, surface water or soil. - Clearing does not result in, or accelerate, disturbance of acid sulfate soils or changes to the hydrology of the location that will result in either aeration of horizons containing iron sulphides or mobilisation of acid or metals. - The duration of clearing for a vegetation retention purpose occurs only for a period that will not contribute to land degradation.	
		Water Act / Planning Act - SDAP	1*	Minor	Possible	Low		The Water Act's Riverine Protection Permit process for works within the banks of watercourses includes erosion and water quality considerations. Taking or interfering with surface or ground water is subject to development approval.	
		Reef 2050 Long-Term Sustainability Plan	3***	Moderate	Possible	Medium		The Plan is a policy document that requires regulatory instruments such as Acts, Regulations or local planning schemes to make its provisions enforceable. A large extent of the plan is focused on improving water quality in the GBR catchments to reduce pressures on the reef from sediment, nutrient and chemical runoff. It sets targets for 2025 on reduction of inorganic nitrogen, fine sediment and particulate nutrient and pesticide loads. Associated Reef 2050 Water Quality Improvement Plan 2017-2022 establishes minimum practice standards across all industries and land uses, support to industries and communities to build a culture of innovation and stewardship that takes them beyond minimum standards, restoration of catchments through works to improve or repair riparian vegetation, streambanks, gullies, waterways and wetlands.	
		State Planning Policy	1*	Minor	Unlikely	Low		The SPP is a policy document that requires regulatory instruments such as Acts, Regulations or local planning schemes to make its provisions enforceable (except assessment benchmarks). The SPP's State interest – water quality requires local planning schemes to integrate development outcomes focused on improving the quality of stormwater. Appendix 2 sets out stormwater management design objectives for construction and post construction phases. The SPP's State interest – emissions and hazardous activities requires local planning schemes to integrate development outcomes focused on avoiding and limiting emissions from hazardous activities, including to stormwater, as well as the mobilisation of ASS. The SPP establishes assessment benchmarks for water quality to apply when local planning schemes do not integrate the listed policies. These apply to MCU, RoL and operational work applications.	

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
		Mackay, Isaac and Whitsunday Regional Plan	3***	Moderate	Possible	Medium		The Plan is a policy document that requires regulatory instruments such as Acts and Regulations to make its provisions enforceable. DRO Environment has a focus on water quality, waterway health and wetlands, which includes the following policies: - Development is located, designed and managed to protect the environmental values and water quality of surface water and groundwater, wetlands and their associated buffers and coastal waters. - Strategies to protect, manage and rehabilitate riparian areas and wetlands are incorporated into land-use planning to maintain and enhance their water quality, scenic, biodiversity, ecological, recreational and corridor values. Supporting programs consist of the following: - Support land management practices that protect waterway health through the voluntary uptake of industry-led programs and incentives. -Develop and monitor regional targets for water quality and waterway health.	
		Abbot Point State Development Area Development Scheme	1*	Minor	Unlikely	Low		SDA wide assessment criteria address water quality directly by requiring compliance with the Environmental Protection (Water) Policy 2009, by requiring avoidance of ASS and contaminated material mobilisation and by referring to engineering standards on stormwater quality and erosion. Assessment criteria apply to all proposed development in the SDA, uniformly deemed a MCU or ROL. The C-G applies the same assessment level as for development proposed under the Planning Act.	
		Transport Infrastructure Act / Land use plan / Sustainable Port Development Guidelines	1*	Minor	Unlikely	Low		The LUP requires development of port land to comply with EPP Water. The SPDG include objectives on discharge to water management, protection of environmental values. They include requirements for environmental assessment of discharges as well as specific requirements on stormwater quality and groundwater quality.	
		Whitsunday Regional Council Planning Scheme - Rural activities code	1*	Minor	Possible	Low		The code includes a performance outcome requiring intensive rural activities to be sited and designed on a lot of sufficient area to provide for adequate setbacks to waterways or wetlands. It includes a performance outcome requiring intensive rural activities to have appropriate disposal of waste and contaminants, with acceptable outcomes being to ensure that off-site release of contaminants does not occur and no significant adverse impacts on surface or ground water occurs.	
		Whitsunday Regional Council Planning	1*	Minor	Unlikely	Low		The zone code objectives include general exclusion of most forms of development; natural features, such as creeks, gullies, waterways and	

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
		Scheme - Environmental management and conservation zone						wetlands are protected and buffered from activities in the zone and adjoining land uses. All proposed developments are assessable against the whole planning scheme, including the coastal environment, ASS and waterways/wetlands overlays.	
		Whitsunday Regional Council Planning Scheme - Rural zone	1*	Minor	Possible	Low		The zone code allows development of a broad range of rural activities, including animal husbandry, cropping, roadside stalls and wholesale nurseries, animal keeping, aquaculture, intensive animal industry, intensive horticulture and rural industry, as well as quarrying. Includes overall outcome for development to avoid or mitigate any adverse impacts on areas of environmental significance (including creeks, gullies, waterways, wetlands, coastal areas, habitats and vegetation) through sensitive location, design, operation and management. The rural activities code generally applies. For the most impacting developments, the assessment must be against the full planning scheme.	
		Whitsunday Regional Council Planning Scheme - Environmental significance overlay code	1*	Minor	Unlikely	Low		The overlay code includes the following performance outcomes, which contribute to preventing erosion and sedimentation: - The long-term management and maintenance of the stream protection zone. - Development of premises adjoining or containing Regulated vegetation intersecting a watercourse must not adversely affect the integrity of the riparian corridor.	
		Whitsunday Regional Council Planning Scheme - ASS overlay code	1*	Minor	Unlikely	Low		The overlay code seeks to ensure development does not release acid and associated metal contaminants into the environment.	
		Whitsunday Regional Council Planning Scheme - Coastal environment overlay code	1*	Minor	Unlikely	Low		The overlay code includes the performance objective for development to avoid the release of hazardous materials into floodwaters.	
		Whitsunday Regional Council Planning Scheme - Waterways and wetlands overlay code	1*	Minor	Unlikely	Low		The overlay code includes the following performance objectives: - For development to be planned and designed considering the land use constraints of the site for achieving stormwater design objectives. - For development to not discharge wastewater to a waterway or off site unless demonstrated to be best-practice environmental management for that site. - For stormwater to not discharge directly to a non-tidal artificial waterway without treatment to achieve stormwater quality management. - For construction activities to avoid or minimise adverse impacts on	

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
								stormwater quality. - For wastewater discharge to a waterway to be managed in a way that maintains ecological processes, riparian vegetation, waterway integrity and downstream ecosystem health. It also prescribes stormwater management design objectives for construction and post construction.	
		Whitsunday Regional Council Planning Scheme - Excavation and filling code	1*	Minor	Unlikely	Low		The code includes the following performance outcomes: - Filling or excavation does not interfere with natural stormwater flows. - Filling or excavation does not directly, indirectly or cumulatively change flood characteristics which may cause adverse impacts external to the development site. - Filling or excavation does not result in any contamination of land or water, or pose a health or safety risk to users and neighbours of the site.	
		Whitsunday Regional Council Planning Scheme - Construction management code	1*	Minor	Unlikely	Low		The code includes the following performance outcomes: - Construction activities and works are managed such that all reasonable and practicable measures are taken to protect the environmental values of water [...] from the impacts of erosion, turbidity and sedimentation, both on and downstream of the development site. - Vegetation is protected to ensure that the ecological health and integrity of riparian corridors, waterways and wetlands are maintained; soil resources are protected against the loss of chemical and physical fertility through processes, such as erosion, mass movement, salinity and water logging. - Vegetation clearing on slopes is minimised to maintain slope stability and prevent erosion and slippage to maintain slope. - Vegetation clearing activities do not directly, indirectly or cumulatively interfere with, or have a worsening effect on, natural stormwater flows within the site.	

2.4 Groundwater

Table 19 Initial risk

Key: OUV: Outstanding Universal Value; C: Consequence; L: Likelihood

Risk Description			Initial Risk		
OUV (Y/N)	Potential impacts, threats or pressures	Development activities	C	L	Original risk
N	Altered groundwater availability and connectivity with surface water resources, along with diminished groundwater quality due to construction and operational activities including earthworks and groundwater extraction.	Special development (highest level of impact)	Moderate	Possible	Medium
		High/medium impact development	Moderate	Possible	Medium
		Low impact development	Minor	Rare	Low

Table 20 Post management risk

Key: OUV: Outstanding Universal Value; C: Consequence; L: Likelihood; MM applic.: Management measure application; PM risk: Post-management risk

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
N	Altered groundwater availability and connectivity with surface water resources, along with diminished groundwater quality due to construction and operational activities including earthworks and groundwater extraction.	EPBC Act	1*	Minor	Unlikely	Low	Low	The Act's referral and controlled action assessment process provides for rigorous assessment where there is a potential for significant impact on a matter of national environmental significance, including from impacts to groundwater. Significant residual impacts are required to be offset.	The combined application of Commonwealth, State, Local Government and port-specific instruments (as detailed in column 'Matter for consideration') to the potential impacts/threats/pressures from new development is comprehensive.
		Environmental Protection Act / Planning Act - SDAP	1*	Minor	Unlikely	Low		The EP Act establishes the general environmental duty and the offence of causing serious or material environmental harm, which are relevant to groundwater impacts. The Acts approval process of EAs for land-based ERAs involves an assessment of impacts to groundwater, where relevant. The EIS process provides for rigorous assessment of major projects to ensure development occurs in a sustainable manner and unacceptable impacts on values, including groundwater, do not occur. The EIS process only applies if	

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
								preferred by the proponent (voluntary basis) or if required by the regulator based on an assessment against the standard criteria.	
		State Development and Public Works Organisation Act	1*	Minor	Possible	Low		The Act's environmental impact assessment process provides for rigorous assessment of major projects to ensure development occurs in a sustainable manner and unacceptable impacts on values, including groundwater, do not occur.	
		Vegetation Management Act / Planning Act / SDAP	1*	Minor	Unlikely	Low		SDAP Code 16 includes the following performance outcomes: - Clearing does not contribute to or accelerate land degradation through waterlogging, or through the salinisation of groundwater. - Clearing does not result in, or accelerate, disturbance of acid sulfate soils or changes to the hydrology of the location that will result in either aeration of horizons containing iron sulphides or mobilisation of acid or metals.	
		Water Act / Planning Act - SDAP	1*	Minor	Unlikely	Low		The water licensing framework established under the Act aims for the sustainable use of groundwater resources. SDAP Code 10's purpose includes maintaining and reversing degradation of underground water systems and minimising adverse impacts on the connectivity between underground water and water in a watercourse, lake or spring. Performance outcomes support these two objectives. Operational work for taking or interfering with water is accepted development under the Planning Regulation subject to conditions that regulate the activity.	
		State Planning Policy	2**	Moderate	Possible	Medium		The SPP is a policy document that requires regulatory instruments such as Acts, Regulations or local planning schemes to make its provisions enforceable (except assessment benchmarks). The SPP's State interest – water quality requires local planning schemes to integrate development outcomes focused on avoiding/minimising disturbance to groundwater-dependent ecosystems and avoid impacts on groundwater in drinking water supply catchments.	
		Mackay, Isaac and Whitsunday Regional Plan	3***	Moderate	Likely	Medium		The Plan is a policy document that requires regulatory instruments such as Acts and Regulations to make its provisions enforceable. DRO Environment has a focus on water quality, waterway health and wetlands, which includes the following policies: - Development is located, designed and managed to protect the environmental values and water quality of surface water and groundwater.	
		Abbot Point State Development Area Development Scheme	1*	Minor	Unlikely	Low		SDA wide assessment criteria do not address groundwater. However, the C-G applies the same assessment level as for development proposed under the Planning Act, which includes groundwater impacts.	

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
		Transport Infrastructure Act / Land use plan / Sustainable Port Development Guidelines	1*	Minor	Unlikely	Low		The SPDG include the objective to prevent groundwater contamination. This is supported by specific requirements on: -The scope of the impact assessment. - Controls that must be implemented during construction and operation activities to prevent contamination of groundwater. - Where required, groundwater monitoring program to demonstrate minimal impact.	
		Whitsunday Regional Council Planning Scheme - Rural activities code	2**	Moderate	Possible	Medium		The overlay code includes a performance outcome requiring intensive rural activities to have appropriate disposal of waste and contaminants, with acceptable outcomes being to ensure that off-site release of contaminants does not occur and no significant adverse impacts on groundwater occurs.	
		Whitsunday Regional Council Planning Scheme - Environmental management and conservation zone	1*	Minor	Possible	Low		The zone code's objectives include general exclusion of most forms of development. No specific provision on groundwater.	
		Whitsunday Regional Council Planning Scheme - Waterways and wetlands overlay code	1*	Minor	Possible	Low		The overlay code includes the following performance outcome: existing natural flows of groundwater are not altered through channelisation, redirection or interruption of flows.	

2.5 Wetlands

Table 21 Initial risk

Key: OUV: Outstanding Universal Value; C: Consequence; L: Likelihood

Risk Description			Initial Risk		
OUV (Y/N)	Potential impacts, threats or pressures	Development activities	C	L	Original risk
Y Cx - Sig	Direct loss of wetlands due to construction and operational activities within the wetland (including earthworks) and reduction of wetland habitat quality in remaining areas due to edge effects (including through increased availability of access) that reduce extent, condition and quality of communities and ecosystems. Elevated sediment, nutrient and contaminant loads in water due to stormwater runoff and emissions/discharges from construction and operational activities (including onshore dredge material placement) causing a decline in quality or loss of wetland habitat. Modification to surface water and groundwater resources (including altered flow paths and water availability) due to construction and operational activities such as earthworks causing a decline in quality or loss of wetland habitat. Elevated levels of air, noise, vibration and lighting emissions associated with construction and operational activities resulting in a reduction of wetland habitat quality, affecting wetland species habitat and the behaviour of species reliant on the wetland (such as migratory, breeding and feeding activity), and leading to elevated stress or mortality in those wetland species. Increased weed and pest pressure on wetland ecosystems due to construction and operational activities, including through increased availability of access.	Special development (highest level of impact)	Major	Almost Certain	High
		High/medium impact development	Major	Likely	High
		Low impact development	Moderate	Possible	Medium

Table 22 Post management risk

Key: OUV: Outstanding Universal Value; C: Consequence; L: Likelihood; MM applic.: Management measure application; PM risk: Post-management risk

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
Y Cx - Sig	Direct loss of wetlands due to construction and operational activities within the wetland (including earthworks) and reduction of wetland habitat quality in remaining areas due to edge effects (including through increased availability of access) that reduce extent, condition and quality of communities and ecosystems. Elevated sediment, nutrient and contaminant loads in water due to stormwater runoff and emissions/discharges from construction and operational activities (including onshore dredge material placement) causing a decline in quality or loss of wetland habitat. Modification to surface water and groundwater resources (including altered flow paths and water availability) due to construction and operational activities such as earthworks causing a decline in quality or loss of wetland habitat. Elevated levels of air, noise, vibration and lighting emissions associated with construction and operational activities resulting in a reduction of wetland habitat quality, affecting wetland species habitat and the behaviour of species reliant on the wetland (such as migratory, breeding and feeding activity), and leading to elevated stress or mortality in those wetland species. Increased weed and pest pressure on wetland ecosystems due to construction and operational activities, including through increased availability of access.	EPBC Act	1*	Minor	Possible	Low	Low	The Act's referral and controlled action assessment process provides for rigorous assessment where there is a potential for significant impact on a matter of national environmental significance, such as listed threatened flora, TECs, Ramsar wetlands (none at Abbot Point), or listed threatened and migratory bird species. Significant residual impacts are required to be offset.	The combined application of Commonwealth, State, Local Government and port-specific instruments (as detailed in column 'Matter for consideration') to the potential impacts/threats/pressures from new development is comprehensive.
		Coastal Protection and Management Act / Planning Act / SDAP	1*	Minor	Unlikely	Low		SDAP Code 8 requires the following: - Development of artificial waterways, canals and dry-land marinas minimises impacts on coastal resources by maintaining the tidal prism volume of the natural waterway to which it is connected. - Development avoids or minimises impacts on category C areas of vegetation and category R areas of vegetation. - Development avoids/minimises/offsets impacts on MSES (includes the Caley Valley Wetlands). - Development does not involve reclamation of land below tidal water, other than for the purposes of specific development types, including strategic ports, priority ports and boat harbours.	
		Environmental Protection Act / Planning Act - SDAP	1*	Minor	Rare	Low		The EP Act establishes the general environmental duty and the offence of causing serious or material environmental harm, which are relevant to vegetation clearing and displacement of birds. The Caley Valley Wetlands are mapped as wetlands of high ecological significance subject to wetland protection areas. SDAP State Code 9 seeks to protect these wetlands from impacts of high impact earthworks. Operational work in wetland protection areas for electricity operating works or government supported transport infrastructure are accepted development only if the works comply with accepted development requirements. The approval process of EAs for land-based ERAs involves an assessment of impacts to vegetation, hydrology, bird habitat and operational impacts on birds, where relevant. The EIS process provides for rigorous assessment of major projects to ensure development occurs in a sustainable manner and unacceptable impacts on values, including remnant vegetation, hydrology and bird habitat, do not occur. The EIS process only applies if preferred by the proponent (voluntary basis) or if required by the regulator based on an assessment against the standard criteria.	

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
		Environmental Offsets Act	2**	Minor	Possible	Low		The Act does not prevent environmental impacts from development but rather mitigates such impacts through offsets. The Act requires the offsetting of significant residual impact to MSES (includes bird species, native vegetation and the Caley Valley Wetlands) is demonstrated.	
		Fisheries Act / Planning Act / SDAP	2**	Moderate	Possible	Medium		The Acts establish a permitting system for works that may constitute waterway barrier works hindering fish passage in waterways. Ensuring adequate flow to allow fish passage would indirectly allow environmental flows to reach wetlands.	
		Nature Conservation Act	1*	Minor	Unlikely	Low		The Act lists specific EVNT flora, the clearing of which is subject to a protected plant clearing permit. Clearing requires to be offset under the Environmental Offset Act. It also lists threatened bird species, leading to their protection as MSES.	
		State Development and Public Works Organisation Act	1*	Minor	Possible	Low		The Act's environmental impact assessment process provides for rigorous assessment of major projects to ensure development occurs in a sustainable manner and unacceptable impacts on values, including remnant vegetation, hydrology and bird habitat, do not occur. Approvals for impacts to MSES and environmental values under the relevant legislation are still required post-EIS.	
		Vegetation Management Act / Planning Act / SDAP	1*	Minor	Unlikely	Low		The Acts require native vegetation clearing to be assessed for impacts and approved. The approval process ensures preventive and mitigation measures are implemented. SDAP State code 16 includes performance outcomes on avoidance and mitigations of impacts. SDAP Code 16 includes the following performance outcome: - Clearing maintains natural wetland and watercourse/drainage feature vegetation to protect bank stability by protecting against bank erosion, water quality by filtering sediments, nutrients and other pollutants.	
		Water Act / Planning Act - SDAP	1*	Minor	Unlikely	Low		The water licensing framework established under the Act aims for the sustainable use of surface water resources. SDAP Code 10's purpose includes maintaining natural ecosystem processes, the riverine environment and physical integrity of watercourses. Performance outcomes support these objectives. Operational work for taking or interfering with water is accepted development under the Planning Regulation subject to conditions that regulate the activity. Operational work that is the construction or modification of a levee is accepted development if the works comply with the self-assessable code	

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
								for the construction or modification of levees, which requires no change in the hydraulic effects beyond the boundaries of the property.	
		Reef 2050 Long-Term Sustainability Plan	3***	Moderate	Likely	Medium		The Plan is a policy document that requires regulatory instruments such as Acts, Regulations or local planning schemes to make its provisions enforceable. Actions for 2018-20 include the identification, protection and management of key seabird nesting islands, and key habitats that support foreshore and pelagic foraging. The Plan's associated Wetlands in the Great Barrier Reef Catchments Management Strategy 2016–2021 provides a whole-of-system framework for catchment management and the protection, maintenance and restoration of wetland systems. The Plan's associated Reef 2050 WQIP addresses water quality challenges by restoring catchments through works to improve or repair riparian vegetation, streambanks, gullies, waterways and wetlands.	
		State Planning Policy	2**	Moderate	Possible	Medium		The SPP is a policy document that requires regulatory instruments such as Acts, Regulations or local planning schemes to make its provisions enforceable (except assessment benchmarks). The SPP's State interest – coastal environment requires local planning schemes to integrate development outcomes ensuring coastal processes and coastal resources are protected by: - Concentrating future development in existing urban areas through infill and redevelopment. - Conserving the natural state of landforms, wetlands and native vegetation in the coastal management district. - Reclamation of land under tidal water is avoided other than for the purpose of specific types of development, including strategic ports, priority ports and boat harbours.	
		Mackay, Isaac and Whitsunday Regional Plan	3***	Moderate	Likely	Medium		The Plan is a policy document that requires regulatory instruments such as Acts and Regulations to make its provisions enforceable. DRO Environment has a focus on water quality, waterway health and wetlands, which includes the following principle and policies: -Principle: The ecological health, environmental values and water quality of coastal, surface, ground waters and wetlands are protected. - Relevant policies: Development is located, designed and managed to protect the environmental values and water quality of surface water and groundwater, wetlands and their associated buffers and coastal waters. Strategies to protect, manage and rehabilitate riparian areas and wetlands are incorporated into land-use planning to maintain and enhance their	

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
								water quality, scenic, biodiversity, ecological, recreational and corridor values.	
		Abbot Point State Development Area Development Scheme	1*	Minor	Unlikely	Low		SDA wide assessment criteria include the following relevant requirements: - Development, consistent with the Environmental Protection (Water) Policy 2009, avoids or otherwise minimises adverse impacts on the environmental values and water quality objectives of receiving waters, arising from altered stormwater quality or flow - Environmental values of the premises on which the development is undertaken and immediate surrounds are identified and managed, consistent with current best practice. - Where the development triggers the need for a buffer to mitigate the impacts of the development, that buffer must be accommodated within the development site. In addition, the C-G applies the same assessment level as for development proposed under the Planning Act, which includes impacts to remnant vegetation, wetlands, bird habitat and hydrology.	
		Transport Infrastructure Act / Land use plan / Sustainable Port Development Guidelines	1*	Minor	Unlikely	Low		The LUP requires environmental best practice to be incorporated in all activities and development. The SPDG includes the following objectives: - The amenity of local sensitive areas, such as air and noise quality, is to be protected through appropriate controls and management techniques. - The proposed development must not adversely impact on surrounding ecological system features, including air quality, water quality, soil quality and habitat values. Specific requirements include: - An impact assessment addressing construction and operational impacts, including details of any proposed flora and fauna removal required, assessment of the environmental values of this flora and fauna and the impacts of the proposed disturbance. - Specific measures required to maintain air quality and manage noise and vibration. - Specific measures on flora and fauna management, including a buffer zone from areas of high conservation value. The SPDG requires cumulative impacts to be evaluated, which is relevant to noise/vibration/lighting a proposed development will emit in addition to pre-existing emissions. Application of some environmental controls appears to rely on the mapping of areas as Environmental Protection under the LUP, which excludes the Caley Valley Wetlands. This may somewhat weaken their protection.	

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
		Whitsunday Regional Council Planning Scheme - Rural activities code	1*	Minor	Possible	Low		The code includes a performance outcome requiring intensive rural activities to be sited and designed on a lot of sufficient area to provide for adequate setbacks to waterways or wetlands. Only applicable to intensive activities	
		Whitsunday Regional Council Planning Scheme - Environmental management and conservation zone	1*	Minor	Unlikely	Low		The zone code's objectives include general exclusion of most forms of development; natural features, such as creeks, gullies, waterways and wetlands are protected and buffered from activities in the zone and adjoining land uses. All proposed developments are assessable against the whole planning scheme, including the coastal environment, ASS and waterways/wetlands overlays.	
		Whitsunday Regional Council Planning Scheme - Rural zone	1*	Minor	Possible	Low		The zone code allows development of a broad range of rural activities, including animal husbandry, cropping, roadside stalls and wholesale nurseries, animal keeping, aquaculture, intensive animal industry, intensive horticulture and rural industry, as well as quarrying. It includes overall outcomes for development to avoid or mitigate any adverse impacts on areas of environmental significance (including wetlands, habitats and vegetation) through sensitive location, design, operation and management. The rural activities code generally applies. For the most impacting developments, the assessment must be against the full planning scheme.	
		Whitsunday Regional Council Planning Scheme - Environmental significance overlay code	1*	Minor	Unlikely	Low		The overlay code includes the following overall outcomes, which contribute to avoiding encroachment of development on wetlands and bird habitat: - Development protects and establishes appropriate buffers to significant fauna habitat. - Development protects known populations and supporting habitat of MNES and EVNT fauna species under the Nature Conservation Act (both categories include birds).	
		Whitsunday Regional Council Planning Scheme - Coastal environment overlay code	1*	Minor	Unlikely	Low		The overlay code includes the following overall outcome, which contributes to avoiding encroachment on bird habitat: - Wherever possible, development within a Coastal hazard area avoids intensification of existing uses, new permanent built structures and seaward extensions to existing built structures. This overall outcome is supported by the following performance outcome: - Except in limited circumstances, development is located outside of an erosion prone area (includes beaches where birds may be nesting and foraging).	
		Whitsunday Regional Council Planning	1*	Minor	Unlikely	Low		The purpose of the overlay code is to ensure that MSES are protected, ecological connectivity and habitat extent are maintained or enhanced,	

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
		Scheme - Waterways and wetlands overlay code						wetlands and waterways are protected, maintained or enhanced, and development in, or adjacent to, wetlands in a Great Barrier Reef catchment does not cause loss or degradation of the wetlands and their environmental values.	
		Whitsunday Regional Council Planning Scheme - Excavation and filling code	1*	Minor	Unlikely	Low		The code includes the following overall outcome: works are undertaken such that environmental harm and nuisance resulting from construction activities is avoided or minimised and the environmental values of water are protected. Relevant supporting performance outcome seeks to maintain the ecological health of wetlands.	
		Whitsunday Regional Council Planning Scheme - Construction management code	1*	Minor	Unlikely	Low		The code includes the following overall outcome: excavation and filling does not adversely or unreasonably impact on the natural environment, drainage conditions or adjacent properties. Supporting performance outcomes seeks to prevent filling or excavation from interfering with natural stormwater flows.	

3 Cultural Heritage Values

3.1 Aboriginal cultural heritage

Table 23 Initial risk

Key: OUV: Outstanding Universal Value; C: Consequence; L: Likelihood

Risk Description			Initial Risk		
OUV (Y/N)	Potential impacts, threats or pressures	Development activities	C	L	Original risk
N	Direct loss or degradation of cultural heritage sites during land or marine area disturbance for construction and operational activities and through increased availability of access to cultural heritage sites.	Special development (highest level of impact)	Major	Likely	High
		High/medium impact development	Moderate	Possible	Medium
		Low impact development	Moderate	Unlikely	Medium

Table 24 Post management risk

Key: OUV: Outstanding Universal Value; C: Consequence; L: Likelihood; MM applic.: Management measure application; PM risk: Post-management risk

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
N	Direct loss or degradation of cultural heritage sites during land or marine area disturbance for construction and operational activities and through increased availability of access to cultural heritage sites.	Aboriginal and Torres Strait Islander Heritage Protection Act	1*	Minor	Possible	Low	Low	The Act enables the Commonwealth to protect an area or object of particular Indigenous significance from threats of injury or desecration. Typically used when State Government has elected not to apply state protection measures.	The combined application of Commonwealth, State, Local Government and port-specific instruments (as detailed in column 'Matter for consideration') to the potential impacts/threats/pressures from new development is comprehensive.
		Great Barrier Reef Marine Park Act / GBRMP zoning plan (general use zone)	1*	Minor	Possible	Low		GBRMPA requires an impact assessment on Traditional Owner heritage values to be undertaken as part of marine park permit applications.	
		Great Barrier Reef Marine Park Act / GBRMP zoning plan	1*	Minor	Possible	Low		As above.	

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
		(Habitat protection zone)							
		Native Title Act (Cwth) / Native Title Act (Qld)	1*	Minor	Possible	Low		The ILUA mechanism allows for Native Title holders to negotiate and agree on the land use/impact boundaries of a project, thereby giving the opportunity to avoid areas of cultural heritage significance.	
		Aboriginal Cultural Heritage Act	1*	Minor	Possible	Low		The Act protects Aboriginal cultural heritage, establishes the cultural heritage duty of care, which is supported by the duty of care guidelines and the CHMP process.	
		Environmental Protection Act	2**	Moderate	Likely	Medium		The EIS process only applies if preferred by the proponent (voluntary basis) or if required by the regulator based on an assessment against the standard criteria. The Act's EIS process provides for rigorous assessment of major projects to ensure development occurs in a sustainable manner and unacceptable impacts on Aboriginal Cultural Heritage do not occur.	
		Marine Parks Act / GBRCMP zoning plan (general use zone)	1*	Minor	Possible	Low		GBRMPA requires an impact assessment on Traditional Owner heritage values to be undertaken as part of marine park permit applications.	
		Marine Parks Act / GBRCMP zoning plan (Habitat protection zone)	1*	Minor	Possible	Low		As above.	
		State Development and Public Works Organisation Act	1*	Minor	Possible	Low		The Act's environmental impact assessment process provides for rigorous assessment of major projects to ensure development occurs in a sustainable manner and unacceptable impacts on Aboriginal Cultural Heritage values do not occur. Consent under agreed management measures for impacts to aboriginal cultural heritage under the relevant legislation is still required post-EIS.	
		Reef 2050 Long-Term Sustainability Plan	3***	Moderate	Possible	Medium		The Plan is a policy document that requires regulatory instruments such as Acts, Regulations or local planning schemes to make its provisions enforceable. The Plan's relevant target for 2020 is "Indigenous and non-Indigenous heritage values are identified, documented and protected in decision-making and planning processes". The objective for 2035 is "Traditional Owners' cultural heritage rights and responsibilities are incorporated in all facets of management." Actions for 2018-20 include: - The facilitation of robust consideration of heritage values in planning processes including port development and associated activities.	

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
								- Updating and completing conservation management plans for key historic shipwrecks. - Implementing the Great Barrier Reef Marine Park Commonwealth Heritage Listed Places and Properties Heritage Strategy 2018–2021. - Finalising and implementing the Great Barrier Reef Marine Park Authority's Aboriginal and Torres Strait Islander Heritage Strategy for the Great Barrier Reef Marine Park. - Further identify, map, monitor and report on key Reef heritage values and sites, including comprehensive maritime surveys in priority sections of the Reef.	
		State Planning Policy	2**	Moderate	Possible	Medium		The SPP is a policy document that requires regulatory instruments such as Acts, Regulations or local planning schemes to make its provisions enforceable (except assessment benchmarks). The SPP's State interest – cultural heritage requires local planning schemes to integrate development outcomes ensuring the protection of Aboriginal cultural heritage to support the requirements of the Aboriginal Cultural Heritage Act 2003.	
		Mackay, Isaac and Whitsunday Regional Plan	3***	Moderate	Likely	Medium		The Plan is a policy document that requires regulatory instruments such as Acts and Regulations to make its provisions enforceable. The Plan's DRO Strong Communities includes a focus on Aboriginal and Torres Strait Islander people, which includes the following policies and program: Policies: - Develop and implement mechanisms to sensitively identify, record, protect and preserve Aboriginal cultural heritage sites and interests. - Support Traditional Owners to engage with government early in planning and decision-making processes in a genuine and respectful manner. Program: - Identify, record and protect Aboriginal cultural heritage sites and interests.	
		Transport Infrastructure Act / Land use plan / Sustainable Port Development Guidelines	1*	Minor	Possible	Low		The Desired Environmental Outcome on ecological processes requires that measures to manage ecological (such as cultural heritage) considerations are developed and adopted as part of development approvals. The SPDG set out the objective that new development must not adversely affect areas of historical significance or indigenous cultural heritage. The SPDG require proponents to do a search of the Cultural Heritage Register for previously identified sites, to manage known or suspected indigenous cultural heritage values in accordance with the *Aboriginal Cultural Heritage Act 2003*, document impact mitigation measures before start of construction and, for a major development on previously undisturbed land, to undertake a	

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
								cultural heritage survey using an archaeologist assisted by the local Traditional Owners and prepare a Cultural Heritage Management Plan.	
		Whitsunday Regional Council Planning Scheme - Environmental management and conservation zone	1*	Minor	Possible	Low		The zone code's stated purpose of the environmental management and conservation overlay zone code includes providing for the protection and rehabilitation of land to maintain cultural heritage significance.	

3.2 Historical heritage

Table 25 Initial risk

Key: OUV: Outstanding Universal Value; C: Consequence; L: Likelihood

Risk Description			Initial Risk		
OUV (Y/N)	Potential impacts, threats or pressures	Development activities	C	L	Original risk
N	Direct loss or degradation of historical heritage sites during land or marine area disturbance for construction and operational activities and through increased availability of access to historical heritage sites.	Special development (highest level of impact)	Minor	Rare	Low
		High/medium impact development	Minor	Rare	Low
		Low impact development	Minor	Rare	Low

Table 26 Post management risk

Key: OUV: Outstanding Universal Value; C: Consequence; L: Likelihood; MM applic.: Management measure application; PM risk: Post-management risk

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
N	Direct loss or degradation of historical heritage sites during land or marine area disturbance for construction and operational activities and through increased availability of access to historical heritage sites.	Environmental Protection Act / Planning Act - SDAP	1*	Minor	Possible	Low	Low	The Act's EIS process provides for rigorous assessment of major projects to ensure development occurs in a sustainable manner and unacceptable impacts on community values do not occur. The EIS process only applies if preferred by the proponent (voluntary basis) or if required by the regulator based on an assessment against the standard criteria.	The combined application of Commonwealth, State, Local Government and port-specific instruments (as detailed in column 'Matter for consideration') to the potential impacts/threats/pressures from new development is comprehensive.
		Queensland Heritage Act / Planning Act / SDAP	1*	Minor	Unlikely	Low		Under the acts, Queensland Heritage listed on the State register is protected. The Planning Act includes an approval trigger for development proposed in the vicinity of listed heritage places or buildings. SDAP Code 14 includes performance objectives for such development to meet.	
		State Development and Public Works Organisation Act	1*	Minor	Possible	Low		The Act's environmental impact assessment process provides for rigorous assessment of major projects to ensure development occurs in a sustainable manner and unacceptable impacts on values, including heritage places, do not occur.	

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
		Reef 2050 Long-Term Sustainability Plan	3***	Moderate	Likely	Medium		The Plan is a policy document that requires regulatory instruments such as Acts, Regulations or local planning schemes to make its provisions enforceable. The Plan's relevant target for 2020 is "(Indigenous and) non-Indigenous heritage values are identified, documented and protected in decision-making and planning processes". The relevant objective for 2035 is "(Indigenous and) non-Indigenous heritage including natural, aesthetic, historic, scientific, and social values are identified, conserved and managed in partnership with the community." Actions for 2018-20 include: - The facilitation of robust consideration of heritage values in planning processes including port development and associated activities. - Updating and completing conservation management plans for key historic shipwrecks. - Implementing the Great Barrier Reef Marine Park Commonwealth Heritage Listed Places and Properties Heritage Strategy 2018–2021.	
		State Planning Policy	2**	Moderate	Possible	Medium		The SPP is a policy document that requires regulatory instruments such as Acts, Regulations or local planning schemes to make its provisions enforceable (except assessment benchmarks). The SPP's State interest – cultural heritage requires local planning schemes to integrate development outcomes ensuring the protection of world, national, state and local cultural heritage by: - Avoiding impacts to world, national and state cultural heritage. - Mitigating impacts to local cultural heritage.	
		Mackay, Isaac and Whitsunday Regional Plan	3***	Moderate	Likely	Medium		The Plan is a policy document that requires regulatory instruments such as Acts and Regulations to make its provisions enforceable. DRO Heritage, arts and cultural development includes the following principle: The region's unique heritage places and experiences are identified, protected and valued, with further opportunities for arts and cultural development provided. The supporting policy is as follows: - Heritage places, including Aboriginal and Torres Strait Islander heritage (such as archaeological sites, landscapes, places or objects) are appropriately recognised and protected.	
		Transport Infrastructure Act / Land use plan / Sustainable Port	1*	Minor	Unlikely	Low		The Acts Desired Environmental Outcome on ecological processes requires that measures to manage ecological (such as cultural heritage) considerations are developed and adopted as part of development approvals. The SPDG set out the objective that new development must not adversely	

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
		Development Guidelines						affect areas of historical significance or indigenous cultural heritage. The SPDG require proponents to do a search of the Cultural Heritage Register for previously identified sites, document impact mitigation measures before start of construction and, for a major development on previously undisturbed land, to undertake a cultural heritage survey using an archaeologist.	
		Whitsunday Regional Council Planning Scheme - Rural activities code	1*	Minor	Possible	Low		The code includes the following overall outcome: development is undertaken in accordance with any strategic plan, prepared and approved master plan or a preliminary approval pursuant to the Act, demonstrating that development avoids or mitigates any adverse impacts on areas of cultural heritage significance through sensitive location, design, operation and management.	
		Whitsunday Regional Council Planning Scheme - Industry investigation area	1*	Minor	Possible	Low		The zone code includes the following overall outcome: development is undertaken in accordance with any strategic plan, prepared and approved master plan or a preliminary approval pursuant to the Act, demonstrating that development avoids or mitigates any adverse impacts on areas of cultural heritage significance through sensitive location, design, operation and management.	
		Whitsunday Regional Council Planning Scheme - Environmental management and conservation zone	1*	Minor	Possible	Low		The stated purpose of the zone code includes providing for the protection and rehabilitation of land to maintain cultural heritage significance.	
		Whitsunday Regional Council Planning Scheme - Rural zone	1*	Minor	Possible	Low		The zone code includes overall outcome: development is undertaken in accordance with any strategic plan, prepared and approved master plan or a preliminary approval pursuant to the Act, demonstrating that development avoids or mitigates any adverse impacts on areas of cultural heritage significance through sensitive location, design, operation and management.	
		Whitsunday Regional Council Planning Scheme - Heritage overlay code	1*	Minor	Possible	Low		The overlay code includes the following overall outcomes: - The cultural heritage significance of the Heritage place is conserved. - Development of the Heritage place is compatible with the cultural heritage significance of the place. - Development is compatible with the conservation and management of the cultural heritage significance of the Heritage place. Performance outcomes support these overall outcomes. Note: not applicable because no historical cultural heritage within study area.	

4 Social Values

4.1 Amenity of surrounding communities

Table 27 Initial risk

Key: OUV: Outstanding Universal Value; C: Consequence; L: Likelihood

Risk Description			Initial Risk		
OUV (Y/N)	Potential impacts, threats or pressures	Development activities	C	L	Original risk
N	Increased road traffic and associated road safety management issues due to construction and operational activities, including traffic associated with commuting workers, delivery of construction materials, plant and equipment and increased heavy vehicle activities. Elevated levels of air, noise, vibration and lighting emissions along with altered visual aspect of port land and surrounding areas due to construction and operational activities causing reduced amenity of surrounding communities.	Special development (highest level of impact)	Major	Almost Certain	High
		High/medium impact development	Moderate	Likely	Medium
		Low impact development	Minor	Possible	Low

Table 28 Post management risk

Key: OUV: Outstanding Universal Value; C: Consequence; L: Likelihood; MM applic.: Management measure application; PM risk: Post-management risk

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
N	Increased road traffic and associated road safety management issues due to construction and operational activities, including traffic associated with commuting workers, delivery of construction materials, plant and equipment and increased heavy vehicle activities. Elevated levels of air, noise, vibration and lighting emissions along with altered visual aspect of port land and surrounding areas due to construction and operational activities causing reduced amenity of surrounding communities.	Environmental Protection Act / Planning Act - SDAP	1*	Minor	Possible	Low	Low	The EP Act establishes the offence of causing environmental nuisance, which is relevant to noise and atmospheric emissions from industrial activities and traffic. The Act's EIS process provides for rigorous assessment of major projects to ensure development occurs in a sustainable manner and unacceptable impacts on community values do not occur. The EIS process only applies if preferred by the proponent (voluntary basis) or if required by the regulator based on an assessment against the standard criteria.	The combined application of Commonwealth, State, Local Government and port-specific instruments (as detailed in column 'Matter for consideration') to the potential impacts/threats/pressures from new development is comprehensive.The WRC planning scheme addresses reverse amenity in the rural zone in only limited cases, which leaves the possibility for new dwellings to be approved near the APSDA boundary and suffer amenity issues in future from new port-related industrial development. However, this risk remains 'low' because it is mitigated by: • the existence of precincts within the APSDA Development Scheme acting as buffer zones between more intensive industrial precincts and neighbouring lots (i.e., Restricted Development and Environmental Management/Material Transportation) • the rural zoning by the WRC planning scheme of the land surrounding the APSDA, which is associated with very low-density residential development.
		State Development and Public Works Organisation Act	1*	Minor	Possible	Low		The Act's environmental and social impact assessment process provides for rigorous assessment of major projects to ensure development occurs in a sustainable manner and unacceptable impacts on community values, do not occur.	
		Work Health and Safety Act	2**	Major	Unlikely	Medium		The Act focuses on workplace amenity but may indirectly benefit local communities. Workplace Health and Safety Queensland has developed a Code of Practice on traffic management for construction or maintenance work under the Act. The purpose of this code is to assist persons to manage workplace health and safety risks posed by traffic to workers and other persons while construction or maintenance work is occurring on, or adjacent to, roads.	
		State Planning Policy	2**	Moderate	Possible	Medium		The SPP is a policy document that requires regulatory instruments such as Acts, Regulations or local planning schemes to make its provisions enforceable (except assessment benchmarks). The SPP's State interest – liveable communities requires local planning schemes to integrate development outcomes seeking for development to maintain or enhance important cultural landscapes and areas of high scenic amenity. The SPP's State interest – emissions and hazardous activities requires local planning schemes to integrate development outcomes aiming to protect industrial development and major infrastructure from encroachment by development that would compromise the ability of the land use to function safely and effectively. This includes medium-impact, high-impact and special industries as well as industrial land in an SDA.	
		Mackay, Isaac and Whitsunday Regional Plan	3***	Moderate	Possible	Medium		The Plan is a policy document that requires regulatory instruments such as Acts and Regulations to make its provisions enforceable.	

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
								DRO Regional landscape values has a focus on scenic amenity, which is supported by the following policy: plan, design and manage development, infrastructure and other activities to manage and enhance regional landscape values. DRO Environment includes a focus on air quality and noise which is supported by the following principle and policies: - Principle: The environment is protected to maintain the health and wellbeing of the community and the natural environment through effective management of air quality and noise. - Policies: Development minimises air, odour and noise emissions and potential impacts of any minor residual emissions on sensitive land uses through its location, design, construction or operation. Adequate separation distances, amelioration measures or appropriate design ensure more intensive land uses (such as those involving activities that may potentially generate air, odour and noise emissions) have limited impact on sensitive receivers. The programs supporting the policies are as follows: - Identify and protect lands suitable for accommodating significant air quality-impacting and noise-emitting activities from incompatible development. - Plan and manage the interface between land zoned for industry and land used for sensitive land use to support and protect industrial land uses in appropriate locations. DRO Transport includes a focus on efficient, accessible and safe transport. The relevant supporting policy is for the safety and wellbeing of road users to be prioritised throughout the region.	
		Abbot Point State Development Area Development Scheme	1*	Minor	Unlikely	Low		The precinct mapping includes buffer precincts and/or less intensive activity precincts between operational port precincts and neighbouring land that could be inhabited. Overall objectives for development include recognition and management of impacts on community values. SDA-wide assessment criteria require that: - Community values of the premises on which the development is undertaken and immediate surrounds are identified and managed, consistent with current best practice. - Development is designed to avoid or minimise emissions that will adversely affect the health and safety, wellbeing and amenity of communities and individuals, supports the achievement of the acoustic and air quality objectives of the Environmental Protection (Noise) Policy 2008 and the Environmental Protection (Air) Policy 2008, and minimises potential impacts arising from (but not limited to) spray drift, odour, noise, dust, smoke or ash	

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
								emissions on sensitive uses, for example by providing for effective separation between land uses or management at the source.	
		Transport Infrastructure Act / Land use plan / Sustainable Port Development Guidelines	1*	Minor	Possible	Low		The LUP precinct mapping does not need to include any particular buffers or less intensive activity precincts for the purpose of residents' amenity because there are no inhabited areas near the port. The LUP Desired Environmental Outcome on community wellbeing includes the objective for NQBP to work with WRC to ensure port operations remain separated from sensitive receiving environments (such as residential). It is unclear whether this would translate into DA-related assessment decisions by NQBP or WRC. The SPDG require buffer zones around sites where higher risk activities could impact on neighbouring land users or if environmental emissions (dust, odours, noise etc.) could occur from the site. The SPDG include the objective for the amenity of neighbouring sites and local sensitive areas, such as air and noise quality, to be protected through appropriate controls and management techniques. It requires the project environmental assessment to consider impacts to air quality and noise amenity. It also requires Construction and Operational EMPs to include measures to manage amenity impacts and details specific requirements regarding mitigation of dust and noise/vibration emissions from projects and operations.	
		Whitsunday Regional Council Planning Scheme - Rural activities code	1*	Minor	Possible	Low		The purpose of the code includes facilitating rural uses and ensure Rural activities are developed in a sustainable manner, which protects the amenity of surrounding premises. Overall outcomes include: - Agricultural land is conserved and not alienated or encroached upon by incompatible land uses. - Uses that support rural production are established on suitable sites where amenity impacts can be effectively managed.	
		Whitsunday Regional Council Planning Scheme - Environmental management and conservation zone	1*	Minor	Unlikely	Low		The environmental management and conservation overlay code includes the following overall outcome: the safety and efficiency of existing and future infrastructure (including road, rail, pipelines, telecommunications and transmission infrastructure) is protected, and the amenity and safety of development is not adversely affected by proximity to such infrastructure. No overall outcome on development not impacting on neighbouring properties' amenity, however it is not a significant issue as development is aimed to be minimal.	
		Whitsunday Regional Council Planning Scheme - Rural zone	1*	Minor	Possible	Low		The zone code includes performance outcomes on amenity: - Development provides for a broad range of Rural activities provided that adverse environmental and amenity impacts are avoided or appropriately	

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
								managed. - Intensive Rural activities are not located adjacent to sensitive uses and are designed and operated to maintain the rural character and amenity of the zone. No provisions on locating rural activities at a distance from non-compatible uses (e.g., industrial) - not a significant issue for rural activities	
		Whitsunday Regional Council Planning Scheme - Agricultural land overlay code	1*	Minor	Unlikely	Low		The purpose of the overlay code is achieved through the following overall outcomes: (a) agricultural land is used for Rural activities; (b) conflict between Rural activities and sensitive uses is avoided; (c) development avoids adverse impacts on agricultural land from land degradation and stormwater runoff; and (d) the stock route network is protected. It also includes the following performance outcome: the boundaries of existing lots containing agricultural lands are not realigned, unless it can be demonstrated that a realignment of lot boundaries does not increase the potential conflict between Rural and Non-rural activities.	

4.2 Industrial safety

Table 29 Initial risk

Key: OUV: Outstanding Universal Value; C: Consequence; L: Likelihood

Risk Description			Initial Risk		
OUV (Y/N)	Potential impacts, threats or pressures	Development activities	C	L	Original risk
N	Industrial incident causing harm or health impacts to surrounding communities.	Special development (highest level of impact)	Major	Likely	High
		High/medium impact development	Major	Possible	Medium
		Low impact development	Minor	Possible	Low

Table 30 Post management risk

Key: OUV: Outstanding Universal Value; C: Consequence; L: Likelihood; MM applic.: Management measure application; PM risk: Post-management risk

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
N	Industrial incident causing harm or health impacts to surrounding communities.	Environmental Protection Act	2**	Moderate	Unlikely	Medium	Low	The Act establishes a permitting system for ERAs, which are activities with the potential to cause environmental harm. This includes chemical manufacturing (ERA 7), chemical storage (ERA 8), hydrocarbon gas refining (ERA 9), gas production (ERA 10) and oil refining and processing (ERA 11). While ERAs focus on risks of environmental harm, the controls required under EAs indirectly act to protect human safety (e.g., air quality).	The combined application of Commonwealth, State, Local Government and port-specific instruments (as detailed in column 'Matter for consideration') to the potential impacts/threats/pressures from new development is comprehensive.
		Planning Act	1*	Moderate	Rare	Low		The Planning Regulation makes a material change of use on land registered as contaminated or potentially contaminated assessable development. SDAP Code 13 addresses the case where a site is identified as having substantial unexploded ordinance (UXO) potential and requires remediation of the site or management of the risk. The Planning Regulation makes a material change of use for a hazardous chemical facility assessable development. SDAP Code 21 sets out	

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
								performance objectives. The purpose of the code is to protect human health and safety, and the built environment from off-site risks resulting from physical or chemical hazards and to protect hazardous chemical facilities from off-site hazard scenarios at existing hazardous chemical facilities or natural hazards.	
		Work Health and Safety Act	1*	Minor	Rare	Low		The Act and associated regulation regulate industrial facilities that store quantities of chemicals above set thresholds through the Major Hazard Facility MHF) licencing process. Operators of MHFs are granted licences of up to five years if the regulator is satisfied that the facility is able to operate safely, and that the safety management system can control risks identified. Risks considered include impact to neighbouring premises from explosions or accidental toxic emission releases. For explosion risks, management measures include requirements for buffer zones.	
		State Planning Policy	2**	Moderate	Possible	Low		The SPP is a policy document that requires regulatory instruments such as Acts, Regulations or local planning schemes to make its provisions enforceable (except assessment benchmarks). The SPP's State interest – emissions and hazardous activities requires local planning schemes to integrate development outcomes seeking to protect sensitive land uses from emissions and hazardous industrial activities.	
		Abbot Point State Development Area Development Scheme	1*	Moderate	Unlikely	Low		The SDA-wide assessment criteria require that development be designed to avoid or otherwise minimise emissions that will adversely affect the health and safety, wellbeing and amenity of communities and individuals The precinct mapping includes buffer precincts and/or less intensive activity precincts between operational port precincts and neighbouring land that could be inhabited.	
		Transport Infrastructure Act / Land use plan / Sustainable Port Development Guidelines	1*	Moderate	Unlikely	Low		The LUP Desired Environmental Outcome on community wellbeing includes the objective for port operations to prioritise the safety and security of all visitors and employees accessing port land. The SPDG include the objectives to minimise the hazards and risks of new developments to port users and local communities, and locate hazardous industries or infrastructure away from other industries and any sensitive receptors. A series of specific requirements support these objectives (e.g. fire safety, materials storage, risk assessments).	
		Whitsunday Regional Council Planning Scheme - Industry	2**	Moderate	Unlikely	Medium		The zone code includes the following overall outcomes: - Industry activities are adequately separated from sensitive uses to minimise the likelihood of environmental harm occurring. - The viability of both existing and future Industry activities are protected	

Risk Description		Risk Treatment Plan and Post Management Risk							
OUV (Y/N)	Potential impacts, threats or pressures	Existing management measures	MM applic.	C	L	PM risk	Combined risk	Matter for consideration	Summary findings
		investigation zone code						from the intrusion of incompatible uses. - The safety and efficiency of existing and future infrastructure (including road, rail, pipelines, telecommunications and transmission infrastructure) is protected and the amenity and safety of development is not adversely affected by proximity to such infrastructure. Note: the APSDA Development Scheme supersedes this zone code in the assessment of development within the APSDA.	