

## Section 20

### Conclusions







## 20 Conclusions

### 20.1 Outline

This document has outlined the surveys and impact assessment that has been undertaken for the Project in relation to relevant matters of NES. This section has been developed in accordance with the requirements of the Tailored EIS Guidelines and provides:

- a summary of the justification for the Project (**Section 20.2**);
- an overview of the environmental acceptability of the Project (**Section 20.3**);
- compliance with the objectives and requirements of the EPBC Act (**Section 20.4**); and,
- a summary of the measures proposed to avoid, mitigate and enhance the potential impacts of the Project on relevant matters of NES (**Section 20.5**).

The assessments documented in **Sections 5 to 18** have been undertaken in accordance with the Tailored EIS Guidelines and have focused on the relevant matters of NES.

### 20.2 Justification for the Project

Bauxite reserves at RTA's existing operation north of the Embley River (East Weipa and Andoom/Ely) are gradually depleting and RTA has identified significant bauxite reserves on the portion of ML7024 that lies south of the Embley River. The Project has bauxite reserves capable of sustaining a mine life of approximately 40 years, depending on the annual production rate. The key objectives of the Project are to:

- extend the life of RTA's mining operations in Weipa beyond depletion of East Weipa and Andoom/Ely reserves;
- maintain continuity of bauxite supply to Gladstone alumina refineries and third parties;
- enable increased bauxite production in the Weipa region in response to the rising world demand for this product and to enhance RTA's competitiveness as a bauxite producer;
- continue mining-related employment in the Western Cape region;
- maintain Weipa as the main residential and commercial support base for the Project;
- operate the mine in a manner that has an acceptable impact on surrounding communities and the environment;
- develop and operate the Project in compliance with all relevant statutory requirements; and,
- continue to maintain an open and honest relationship with stakeholders.

The Project would provide an average of 950 direct jobs for the construction of the initial 22.5Mdtpa capacity operation, and approximately 550 and 1,350 direct local area jobs at the 22.5Mdtpa and 50Mdtpa production rates, respectively. The employment and economic benefits provided by the Project at the local, regional, State and national levels are significant and are detailed in **Section 17.4.1**.

The option of not proceeding with the Project is not financially feasible as the bauxite reserves will be depleted in RTA's current mining areas leading to the progressive closure of RTA's existing Weipa mining operations. Without an alternative source, the Gladstone alumina refineries would lose a viable, ongoing source of bauxite and the town of Weipa will lose a major financial contributor.

RTA has been undertaking studies to optimise the Project design which has taken stakeholder consultation and potential environmental impact into account. Alternatives for the following Project components have been considered:

- location of the Port and stockpiles;
- construction of the Port jetty;
- Port capacity;
- location of anchorage area;
- locations of the barges and ferry terminals;
- location of the tug berths;
- disposal of dredged material;
- location of the temporary barge landing area;
- location of the temporary passenger jetty;
- construction workforce accommodation;
- shipping routes;
- water supply;
- beneficiation plant;
- tailings system;
- power supply; and,
- location of the beneficiation plants.

The feasibility from a technical and operational perspective for each alternative was assessed along with the potential impacts of each feasible alternative on matters protected by each of the six controlling provisions relevant to each Project component (refer **Section 3.12**).

### 20.3 Environmental Acceptability of the Project

A comprehensive and systematic process was undertaken to assess the potential environmental impacts of the Project on matters of NES that are known or likely to occur in the areas that would be or are likely to be impacted by the proposed action. A conservative approach was taken and matters of NES that could possibly occur in the Project area were also assessed in detail. A summary of the measures proposed to avoid, mitigate and enhance the potential relevant impacts on matters of NES is provided in **Section 20.5**.

The results of the impact assessment process concluded that with the implementation of the proposed avoidance and mitigation measures, the residual impacts associated with the construction and operation of the Project on all listed threatened species, non-avian and avian migratory species that are known to occur, likely or possibly occur within the Project area would not be significant (refer **Sections 5.3.4, 5.4.4, 5.5.4, 5.6.4, 5.7.4, 5.8.4, 6.3.4, 6.4.4, 6.5.4, 7.3.5, 7.4.5, 8.5, 9.3.4, 9.4.4 and 9.5.4**). Residual Project-related impacts on the CMA were also determined not to be significant (refer **Section 10.4**).

In relation to impacts associated with shipping activities, it was determined that Project-related shipping activities at maximum production would result in no significant impacts on the CMA, GBRMP, GBRWHA and GBRNHP (refer **Sections 10.6, 11.6, 12.6 and 13.6**). It is also noted that in over 40 years of shipping, RTA has not had any shipping incidents that have resulted in environmental harm.

In conclusion, it is considered that the Project is environmentally acceptable.

### 20.4 Compliance with the Objectives and Requirements of the EPBC Act

The Project's compliance with the objectives of the EPBC Act are summarised in **Table 20-1**. The Project's compliance with the principles of ecological sustainable development are summarised in **Table 20-2**.

**Table 20-1 Compliance with the Objectives of the EPBC Act**

Objective	How it was addressed?	Section Reference
To provide for the protection of the environment, especially those aspects of the environment that are matters of NES	<p>The Project was planned in a manner to avoid the most environmentally and culturally sensitive areas of the Project area where technically and economically feasible.</p> <p>If impacts could not be avoided, detailed studies were undertaken to assess the relevant impacts on matters of NES specified in the Tailored EIS Guidelines. The results of these studies are documented in this EIS. These studies concluded that impacts would not be significant following implementation of the proposed mitigation measures.</p>	<p>Project alternatives and avoidance measures are outlined in <b>Sections 3.12</b> and <b>3.13</b>.</p> <p>Details on the studies and impact assessment on matters of NES are included in <b>Sections 5</b> to <b>13</b>.</p>
To promote ecologically sustainable development through the conservation and ecologically sustainable use of natural resources	<p>One of the overall objectives of the Project is to extract important natural resources in a manner that has acceptable impacts on the surrounding community and the environment. The Project's compliance with the principles of ecologically sustainable development is provided in <b>Table 20-2</b>.</p> <p>The detailed studies undertaken as part of the EIS have concluded that relevant impacts of the Project would not be significant following implementation of the proposed mitigation and enhancement measures.</p> <p>Some specific measures that would provide longer term conservation and management of natural resources include progressive rehabilitation with native species, fire, weed and feral pig control programs. Additional measures are outlined in the each matters of NES section. A summary of all of these measures is included in <b>Section 20.5</b>.</p> <p>RTA undertook extensive consultation with the local community and Traditional Owners in accordance with RTA's ILUA, the WCCCA, throughout Project design and the development of mitigation measures (refer <b>Section 3.14</b>).</p>	<p>Key objectives of the Project are provided in <b>Section 2.3</b>.</p> <p>Details on the studies and impact assessment on matters of NES are included in <b>Sections 5</b> to <b>13</b>.</p> <p>Details on these on specific measures are included in <b>Sections 3.10</b> and <b>6.3.4</b>. Details for each matter of NES are included in <b>Sections 5</b> to <b>13</b> and are summarised in <b>Section 20.5</b>.</p>
To promote the conservation of biodiversity	<p>The implementation of the proposed SoE environmental buffer system and proposed mitigation measures such as fire, weed and feral pig control would assist in enhancing undisturbed areas and promote biodiversity in these areas.</p>	<p>Refer to <b>Sections 5</b> to <b>13</b> for impacts.</p> <p>Details on these measures are included in <b>Section 6.3.4</b> and are summarised in <b>Section 20.5</b>.</p>
To provide for the protection and conservation of heritage	<p>RTA has, and continues to build relationships with the local communities, including Traditional Owners, and will work with these stakeholders to manage heritage values. The WCCCA provides the process by which consultation with Traditional Owners is to occur in relation to mining activities such as the SoE Project. To manage the heritage values of its lease RTA maintains a comprehensive cultural heritage management system (CHMS).</p> <p>RTA remains committed to the existing obligations under the WCCCA with regard to Traditional Owners' involvement in land and heritage management. To achieve this RTA recognises and supports the need for the joint development of a comprehensive Communities, Heritage and Environment Management Plan (CHEMP) for the area. The CHEMP would provide the framework for RTA and Traditional Owners to work together to manage the community, heritage and environmental values of the Project area in the context of the WCCCA. The CHEMP</p>	<p><b>Section 17.3</b> provides details on cultural heritage consultation and incorporation within the SIMP.</p> <p>Potential impacts on cultural heritage are provided in <b>Section 17.4.8.1</b>.</p>

Objective	How it was addressed?	Section Reference
	would include, but not be limited to, details of buffer zones and land management strategies for significant heritage areas such as Waterfall (Ina Creek), False Pera Head (Amban), Pera Head and Boyd Bay.	
To promote a co-operative approach to the protection and management of the environment involving governments, the community, land-holders and Indigenous peoples	<p>An extensive consultation and communication program was undertaken as part of the EIS with all stakeholders. RTA is committed to working with the Commonwealth and Queensland governments to obtain all the necessary environmental approvals for this Project and operate it in an environmentally responsible manner.</p> <p>RTA has, and continues to build, relationships with the local communities, including Traditional Owners, and will work with these stakeholders to manage environmental resources and local impacts. RTA worked closely with the WCCCC and the South of Embley Sub-Committee, in accordance with RTA's ILUA and the WCCCA, throughout the consultation phases for the Project.</p> <p>RTA is committed to:</p> <ul style="list-style-type: none"> <li>• developing and implementing a Communities, Heritage and Environment Management Plan with Traditional Owners;</li> <li>• implementing a Land and Sea management Programme through direct employment of Traditional Owners in permanent and casual roles; and,</li> <li>• supporting the establishment of a local recreational fishing reference group to provide a forum to develop and help implement the establishment of a communities fisheries project.</li> </ul>	<p><b>Section 3.14</b> outlines the consultation effort.</p> <p><b>Section 2.7</b> outlines the approvals required.</p> <p><b>Section 17.4.8</b> outlines potential social and economic impacts of the Project on Traditional Use activities.</p> <p><b>Section 17.4.3.3</b> outlines the potential social and economic impacts on local charter and recreational fishing.</p>
To assist in the co-operative implementation of Australia's international environmental responsibilities	<p>RTA is committed to working with the Commonwealth and the Queensland Governments to undertake the appropriate environmental assessments and obtain all the necessary environmental approvals for the Project and operate the Project in a manner that is consistent with Commonwealth and Queensland environmental law. In this way RTA is committed to co-operatively assisting Australia meet its international environmental responsibilities.</p> <p>It was concluded that the environmental impact on the GBRWHA's values would be negligible.</p>	<p><b>Section 3.14</b> outlines the consultation effort.</p> <p><b>Section 2.7</b> outlines the approval requirements.</p> <p>Impact assessments are documented in <b>Sections 5 to 18</b>.</p>
To recognise the role of Indigenous people in the conservation and ecologically sustainable use of Australia's biodiversity	<p>RTA has, and continues to build relationships with the local communities, including Traditional Owners, and will work with these stakeholders to manage environmental resources and local impacts. RTA worked closely with the WCCCC and the South of Embley Sub-Committee, in accordance with RTA's ILUA and the WCCCA, throughout the consultation phases for the Project.</p> <p>RTA is committed to:</p> <ul style="list-style-type: none"> <li>• developing and implementing a CEMP with Traditional Owners;</li> <li>• implementing a Land and Sea management Programme through direct employment of Traditional Owners in permanent and casual roles; and,</li> <li>• carry out ethno-botanical and ethno-faunal studies in the Project area.</li> </ul>	<p><b>Section 3.14</b> outlines the consultation effort.</p> <p><b>Section 17.4.8</b> outlines potential social and economic impacts of the Project on Traditional Use Activities.</p>

Objective	How it was addressed?	Section Reference
<p>To promote the use of Indigenous peoples' knowledge of biodiversity with the involvement of, and in co-operation with, the owners of the knowledge</p>	<p>RTA has, and continues to build relationships with the local communities, including Traditional Owners, and will work with these stakeholders to manage environmental resources and local impacts.</p> <p>Many of the key mitigation measures will be developed and implemented in consultation with the Traditional Owners through the CHEMA. The SIMP contains a Land and Sea Management Programme (LSMP) designed to engage Traditional Owners directly in land and sea management activities in the construction and operational phases of the Project. Traditional Owner involvement in the LSMP would include, for example, activities such as the establishment of the proposed SoE environmental buffers, fire management, weed management, and marine turtle nesting monitoring.</p> <p>RTA would evaluate options to work collaboratively to develop a knowledge database of flora and fauna species of cultural significance in the region.</p> <p>RTA will jointly develop a rehabilitation process with the Traditional Owners and the relevant WCCCC sub-committee, in accordance with RTA's ILUA and the WCCCA, prior to the commencement of mining. RTA would continue to report annually to the relevant WCCCC sub-committee on rehabilitation programs, including an inventory of areas disturbed by mining, timeframes for rehabilitation, and supporting reports pertaining to the monitoring of rehabilitated areas.</p> <p>RTA is committed to:</p> <ul style="list-style-type: none"> <li>• developing and implementing a CHEMA with Traditional Owners;</li> <li>• implementing a LSMP through direct employment of Traditional Owners in permanent and casual roles; and,</li> <li>• carrying out ethno-botanical and ethno-faunal studies in the Project area.</li> </ul>	<p><b>Section 3.14</b> outlines the consultation effort.</p> <p><b>Section 17.4.8</b> outlines potential social and economic impacts of the Project on Traditional Use Activities.</p> <p><b>Section 17.4.8.1</b> outlines Traditional Owner involvement in land and sea management activities.</p> <p><b>Section 3.10.3.7</b> outlines consultation undertaken on rehabilitation.</p>



**Table 20-2 Compliance with the Principles of Ecologically Sustainable Development**

<b>Principle of Ecologically Sustainable Development</b>	<b>How it was addressed?</b>	<b>Section Reference</b>
Decision-making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations	The planning and design process for the Project examined a range of alternatives and considered the environmental implications of those alternatives in the decision-making process. This assisted in identifying approaches that would minimise impacts on matters of NES, result in no significant residual impacts and provide a comprehensive suite of avoidance, mitigation and enhancement measures to further reduce impacts. In addition the Project provides significant economic and social benefits to the local community including Traditional Owners, as well as the FNQ, State and national economies.	Project alternatives and avoidance measures are outlined in <b>Sections 3.1.2</b> and <b>3.13</b> .  Details on the studies and impact assessment on matters of NES are included in <b>Sections 5</b> to <b>13</b> .  Social and economic matters are considered in <b>Section 17</b> .
If there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation	The environmental impact assessment found that there would not be significant residual impacts on matters of NES.	Details on the studies and impact assessment on matters of NES are included in <b>Sections 5</b> to <b>13</b> .
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 Project was planned in a manner to avoid the most environmentally and culturally sensitive areas of the Project area where technically and economically feasible.  If impacts could not be avoided, detailed studies were undertaken to assess the relevant impacts on matters of NES specified in the Tailored EIS Guidelines. The results of these studies are documented in this EIS. These studies concluded that impacts would not be significant following implementation of the proposed mitigation measures.  Also, progressive rehabilitation with native species is a specific measure that would provide long-term conservation and management of natural resources and inter-generational equity.	Project alternatives and avoidance measures are outlined in <b>Sections 3.1.2</b> and <b>3.13</b> .  Details on the studies and impact assessment on matters of NES are included in <b>Sections 5</b> to <b>13</b> .
The conservation of biological diversity and ecological integrity should be a fundamental consideration in decision-making	RTA has undertaken studies to optimise the Project design and minimise ecological impacts where practicable.  The Project would not lead to significant impacts on any species in the Project area.  Proposed mitigation measures such as fire, weed and feral pig control would assist in enhancing and promoting biodiversity in areas that would not be disturbed by the Project.	Project alternatives and avoidance measures are outlined in <b>Sections 3.1.2</b> and <b>3.13</b> .  Refer to <b>Sections 5</b> to <b>13</b> for impacts.



Principle of Ecologically Sustainable Development	How it was addressed?	Section Reference
	Also, progressive rehabilitation with native species would provide long-term conservation and management of natural resources.	Details on these measures are included in <b>Section 6.3.4</b> and are summarised in <b>Section 20.5</b> .
Improved valuation, pricing and incentive mechanisms should be promoted	As required by law, the Proponent will pay all taxes, duties and government charges relating to emissions, pollutants, waste disposal and use of or access to natural resources.	

## 20.5 Summary of Avoidance, Mitigation and Enhancement Measures

Avoidance and mitigation measures have been proposed for each of the matters of NES potentially impacted by the Project. Proposed avoidance and mitigation measures are considered to be effective for their respective purposes and are summarised in **Table 20-3** to **Table 20-10**. Following implementation of these measures, the residual impacts, associated with the construction and operation of the Project on all listed threatened species and ecological communities and non-avian and avian listed migratory species that are known or likely to occur, or could possibly occur within the Project area would not be significant. Project-related residual impacts on the CMA, GBRMP, GBRWHA and GBRNHP would also not be significant.

Under the *EPBC Act Environmental Offsets Policy* (DEWHA 2012b), offsets are not required where the residual impact is not likely to be significant (when assessed against the *Matters of National Environmental Significance: Significant Impact Guidelines 1.1* (DEWHA 2009c)). As such, offsets relating to listed threatened species and ecological communities, and listed migratory species that are known or likely to occur, or could possibly occur within the Project area are not required under the Commonwealth offsets policy. Offsets relating to the CMA, GBRMP, GBRWHA and GBRNHP are also not required under the Commonwealth offset policy.

It is noted for completeness that the feral pig control program constitutes an offset for marine turtle species under the *Queensland Biodiversity Offsets Policy* (DERM 2011) and the implementation of this offset is a condition recommended by the Queensland Coordinator General in his report (Queensland Government 2012) of the Project. It is also noted that the feral pig control program would also have consequential positive effects on Estuarine Crocodiles as nest predation and habitat destruction by feral pigs is known to impact on this species in the area. The implementation of the feral pig control program would also lead to improved conditions of wetland and riparian habitats.

It is also noted for completeness that a condition recommended by the *Queensland Coordinator General's Report on the EIS* (Queensland Government 2012) for the Project is that RTA translocate and/or propagate 3.5 plants of Chocolate Tea Tree Orchid and Cooktown Orchid for each plant found within the footprint of disturbance and establish such plants within a 355.2ha offset area comprising riparian habitat (RE 3.3.5, RE 3.3.9, and RE 3.3.21).

**Table 20-3** to **Table 20-10** summarise relevant avoidance, mitigation and enhancement measures proposed for each of the assessed matters of NES.

**Table 20-3 Summary of Avoidance, Mitigation and Enhancement Measures – Threatened Terrestrial Flora**

Avoidance, Mitigation and Enhancement Measures	Section Reference	<i>Calophyllum bicolor</i>	Cooktown Orchid	Chocolate tea Tree Orchid	Ant Plant	Beach Nightshade	<i>Spathoglottis pllicata</i>
<b>Avoidance Measures</b>							
SoE environmental buffer system	6.3.4.5 5.3.4 5.5.4 5.6.4 5.7.4 5.8.4	✓	✓	✓	✓	✓	✓
Siting facilities in areas with less sensitive habitat	3.13 5.3.4 5.4.4 5.5.4 5.6.4 5.7.4 5.8.4	✓	✓	✓	✓	✓	✓
Mining would not occur in areas that provide habitat for this species	5.3.4 5.4.4 5.5.4 5.6.4 5.8.4	✓	✓	✓	✓		✓
Not constructing a second dam on the Ward River	5.3.4 5.4.4 5.5.4 5.6.4 5.7.4 5.8.4	✓	✓	✓	✓	✓	✓

Avoidance, Mitigation and Enhancement Measures	Section Reference	<i>Calophyllum bicolor</i>	Cooktown Orchid	Chocolate tea Tree Orchid	Ant Plant	Beach Nightshade	<i>Spathoglottis pllicata</i>
<b>Mitigation Measures</b>							
Weed management program	6.3.4.3 5.3.4 5.4.4 5.5.4 5.6.4 5.7.4 5.8.4	✓	✓	✓	✓	✓	✓
Dust abatement measures	5.4.4 5.5.4		✓	✓			
Translocate and/or propagate 3.5 plants for each plant found within the footprint of disturbance	5.4.5 5.5.5		✓	✓			
Stormwater management strategy	16.2.2	✓	✓	✓	✓	✓	✓
Develop and implement an erosion and sediment management plan prior to construction	16.2.2	✓	✓	✓	✓	✓	✓
Surface water monitoring	16.5.1	✓	✓	✓	✓	✓	✓
Progressive rehabilitation	3.10.3	✓	✓	✓	✓	✓	✓
<b>Enhancement Measures</b>							
Fire management program	6.3.4.2 5.3.4 5.4.4 5.5.4 5.6.4 5.7.4 5.8.4	✓	✓	✓	✓	✓	✓

Avoidance, Mitigation and Enhancement Measures	Section Reference	<i>Calophyllum bicolor</i>	Cooktown Orchid	Chocolate tea Tree Orchid	Ant Plant	Beach Nightshade	<i>Spathoglottis pllicata</i>
Feral pig control program	6.3.4.4						
	5.3.4						
	5.4.4	✓	✓	✓	✓	✓	✓
	5.5.4						
	5.6.4						
	5.8.4						



**Table 20-4 Avoidance, Mitigation and Enhancement Measures – Terrestrial Fauna**

Avoidance, Mitigation and Enhancement Measures	Section Reference	Red Goshawk	Masked Owl	Northern Quoll
<b>Avoidance Measures</b>				
SoE environmental buffer system	6.3.4.5 6.4.4 6.5.4	✓	✓	✓
Siting facilities in areas with less sensitive habitat	3.13 6.3.4 6.4.4 6.5.4	✓	✓	✓
Weed management program	6.3.4.3 6.4.4 6.5.4			
Installation of dry culvert cells at access road crossings of Winda Winda Creek and Norman Creek	6.5.4			✓
Progressive rehabilitation	3.10.3 6.3.4.6	✓	✓	✓
<b>Enhancement Measures</b>				
Fire management program	6.3.4.2 6.4.4 6.5.4	✓	✓	✓
Feral pig control program	6.3.4.4	✓		

**Table 20-5 Avoidance, Mitigation and Enhancement Measures – Avian Migratory**

Avoidance, Mitigation and Enhancement Measures	Section Reference	Avian Migratory
<b>Avoidance Measures</b>		
SoE environmental buffer system	6.3.4.5 8.5	✓
Siting facilities in areas with less sensitive habitat	3.13 8.5	✓
<b>Mitigation Measures</b>		
Progressive rehabilitation	6.3.4.6 8.5	✓
Weed management program	6.3.4.3 8.5	✓
<b>Enhancement Measures</b>		
Fire management program	6.3.4.2 8.5	✓
Feral pig control program	6.3.4.4 8.5	✓

**Table 20-6 Avoidance, Mitigation and Enhancement Measures – Commonwealth Marine Area, Threatened Estuarine and Marine Fauna and Non-Avian Migratory Species – Dredging and Offshore Spoil Disposal**

Relevant Impacts	Avoidance, Mitigation and Enhancement Measures	Section References	CMA	Marine Turtles	Elasmobranchs	Estuarine Crocodile	Dugong	Cetaceans
Physical disturbance to benthic or intertidal habitats  Creation of a turbidity plume  Deposition of dredged sediments on benthic habitats	In accordance with DMPs to be approved by DSEWPaC and EHP	Appendix 7-C and 7-D	✓	✓	✓	✓	✓	✓
Entrainment in dredge	In accordance with DMPs to be approved by DSEWPaC and EHP	Appendix 7-C and 7-D		✓				
Altered light regime	In accordance with DMPs to be approved by DSEWPaC and EHP	Appendix 7-C and 7-D		✓				
Underwater acoustic impacts	In accordance with DMPs to be approved by DSEWPaC and EHP	Appendix 7-C and 7-D		✓				
Changes to coastal processes (erosion and deposition)	Open trestle structure of Port Monitoring and mitigation of cliff erosion near Port	7.3.6.1		✓				

**Table 20-7 Avoidance, Mitigation and Enhancement Measures – Threatened Estuarine and Marine Fauna and Non-Avian Migratory Species – Marine and River Facilities Construction and Operation**

Relevant Impacts	Avoidance, Mitigation and Enhancement Measures	Section References	Marine Turtles	Elasmobranchs	Estuarine Crocodile	Dugong	Cetaceans
Physical disturbance to benthic or intertidal habitats  Physical disturbance to beach habitats from piling or temporary beach access	Temporary seaborne access management measures	7.3.6.2 7.4.6.2 9.4.5.2	✓	✓ (benthic and intertidal habitats only)		✓ (benthic and intertidal habitats only)	
Physical disturbance to beach habitats from piling or temporary beach access	Monitoring of marine turtle hatchling success and behaviour, and implementation of adaptive management as required	7.4.2.2	✓				
Altered light regime	Port lighting plan	Table 7-11 7.3.6.2	✓				
Underwater acoustic impacts	Pile driving management	7.3.6.2 9.4.5.2 9.5.5.2	✓			✓	✓
	Equipment and machinery maintenance	7.3.6.2 9.3.5.2 9.4.5.2 9.5.5.2	✓		✓	✓	✓
Changes to recreational use of beaches	Access permit system for marine turtle nesting beach	7.3.6.2	✓				
Altered light regime  Physical disturbance to beach habitats from piling or temporary beach access	Feral pig control program (enhancement measure)	7.3.6.4	✓				

**Table 20-8 Avoidance, Mitigation and Enhancement Measures – Threatened Estuarine and Marine Fauna and Non-Avian Migratory Species –Dam C Construction and Operation**

Relevant Impacts	Avoidance, Mitigation and Enhancement Measures	Section References	Estuarine Crocodile
Physical disturbance to habitats from Dam C	Not constructing a second dam on the Ward River	3.13 9.3.5.3	✓
	Feral pig control program	7.3.6.4	✓

**Table 20-9 Avoidance, Mitigation and Enhancement Measures – Threatened Estuarine and Marine Fauna and Non-Avian Migratory Species —Project-related Shipping Activities**

Relevant Impacts	Avoidance, Mitigation and Enhancement Measures	Section References	Marine Turtles	Dugong	Cetaceans
Altered light regime	Vessel lighting management	7.3.6.3	✓		
	Feral pig control program (enhancement measure)	7.3.6.4	✓		
Underwater acoustic impacts	Vessel maintenance	7.3.6.3 9.4.5.3 9.5.5.3	✓	✓	✓
Marine oil spills	Marine oil spill avoidance measures	7.3.6.3 9.4.5.3 9.5.5.3	✓	✓	✓
Vessel discharges	Vessel discharge management	7.3.6.3	✓		
Vessel strike	Transit lane for ferry operating in the Hey/Embley River	7.3.6.3 9.4.5.3 9.5.5.3	✓	✓	✓
	Pilotage of large vessels in shallow and confined areas	7.3.6.3 9.4.5.3 9.5.5.3	✓	✓	✓
	The passenger vessel would be limited to a speed of 6 knots in water of less than 2.5m in depth when approaching berth	7.3.6.3 9.4.5.3 9.5.5.3	✓	✓	✓



**Table 20-10 Avoidance, Mitigation and Enhancement Measures – Commonwealth Marine Area, Great Barrier Reef Marine Park, Great Barrier Reef World Heritage Area and National Heritage Place —Project-related Shipping Activities**

Avoidance, Mitigation and Enhancement Measures	Section References	CMA	GBRMP	GBRWHA	GBRNHP
Use of existing shipping routes	10.4.2.2 11.4.1.2 11.4.2.2 11.4.4.1 11.4.7.2 Table 12-3 Table 12-4 Table 12-5 Table 12-6 13.4.1	✓	✓	✓	✓
Ballast Water Management Plan (including <i>Quarantine Act 1908</i> and AQIS requirements) for all bauxite vessels	10.4.1.2 11.4.5.2 Table 12-5 Table 12-6 13.4.1	✓	✓	✓	✓
Antifouling coating systems applied to exposed surfaces of bauxite vessels	10.4.1.2 11.4.5.2 Table 12-5 Table 12-6 13.4.1	✓	✓	✓	✓
Maintain a relatively new bauxite shipping fleet	10.4.1.2 11.4.1.2 11.4.2.2 11.4.5.2 Table 12-3 Table 12-4 Table 12-5 Table 12-6 13.4.1	✓	✓	✓	✓

Avoidance, Mitigation and Enhancement Measures	Section References	CMA	GBRMP	GBRWHA	GBRNHP
Minimise delays at port or at anchor for bauxite vessels	10.4.1.2 11.4.5.2 Table 12-5 13.4.1	✓	✓	✓	✓
Mussel trap monitoring in the vicinity of the proposed Port	10.4.1.2	✓			
Use of pilotage where required	10.4.2.2 11.4.1.2 Table 12-3 Table 12-4 Table 12-5 Table 12-6 13.4.1	✓	✓	✓	✓
Use of ReefVTS for vessels of greater than 50m	10.4.2.2 11.4.1.2 11.4.7.2 Table 12-3 Table 12-4 Table 12-5 Table 12-6 13.4.1	✓	✓	✓	✓
Use of tugs during berthing operations	10.4.2.2 11.4.1.2 Table 12-3 Table 12-4 Table 12-5 Table 12-6 13.4.1	✓	✓	✓	✓

Avoidance, Mitigation and Enhancement Measures	Section References	CMA	GBRMP	GBRWHA	GBRNHP
Response to any oil spill in accordance with the Australian National Oil Spill Contingency Plan and ReefPlan	Table 12-3 Table 12-4 Table 12-5 Table 12-6 13.4.1	✓	✓	✓	✓
Avoidance action by vessels if marine megafauna are spotted or reported in vessel path where possible, and reporting of vessel strikes	10.4.3.2 11.4.2.2	✓	✓	✓	✓
Bauxite ship heavy fuel oil has sulphur content not exceeding 3.5% and notification of engine room if excessive funnel smoke is observed	11.4.3.2	✓	✓	✓	✓

## **20.6 Conclusion**

The results of the impact assessment process concluded that with the implementation of the proposed avoidance and mitigation measures, the residual impacts associated with the construction and operation of the Project on all listed threatened species, non-avian and avian migratory species that are known to occur, likely or possibly occur within the Project area would not be significant. Residual Project-related impacts on the CMA were also determined not to be significant.

In relation to impacts associated with shipping activities, it was determined that predicted Project-related shipping activities at maximum production would result in no significant impacts on the CMA, GBRMP, GBRWHA and GBRNHP. It is also noted that in over 40 years of bauxite shipping, RTA has not had any bauxite shipping incidents that have resulted in environmental harm.

The Project would provide an average of 950 direct jobs for the construction of the initial 22.5Mdtpa capacity operation, and approximately 550 and 1,350 direct local area jobs at the 22.5Mdtpa and 50Mdtpa production rates, respectively.

It is, therefore, considered that the Project is environmentally, socially and economically acceptable and complies with the principles of ecologically sustainable development.