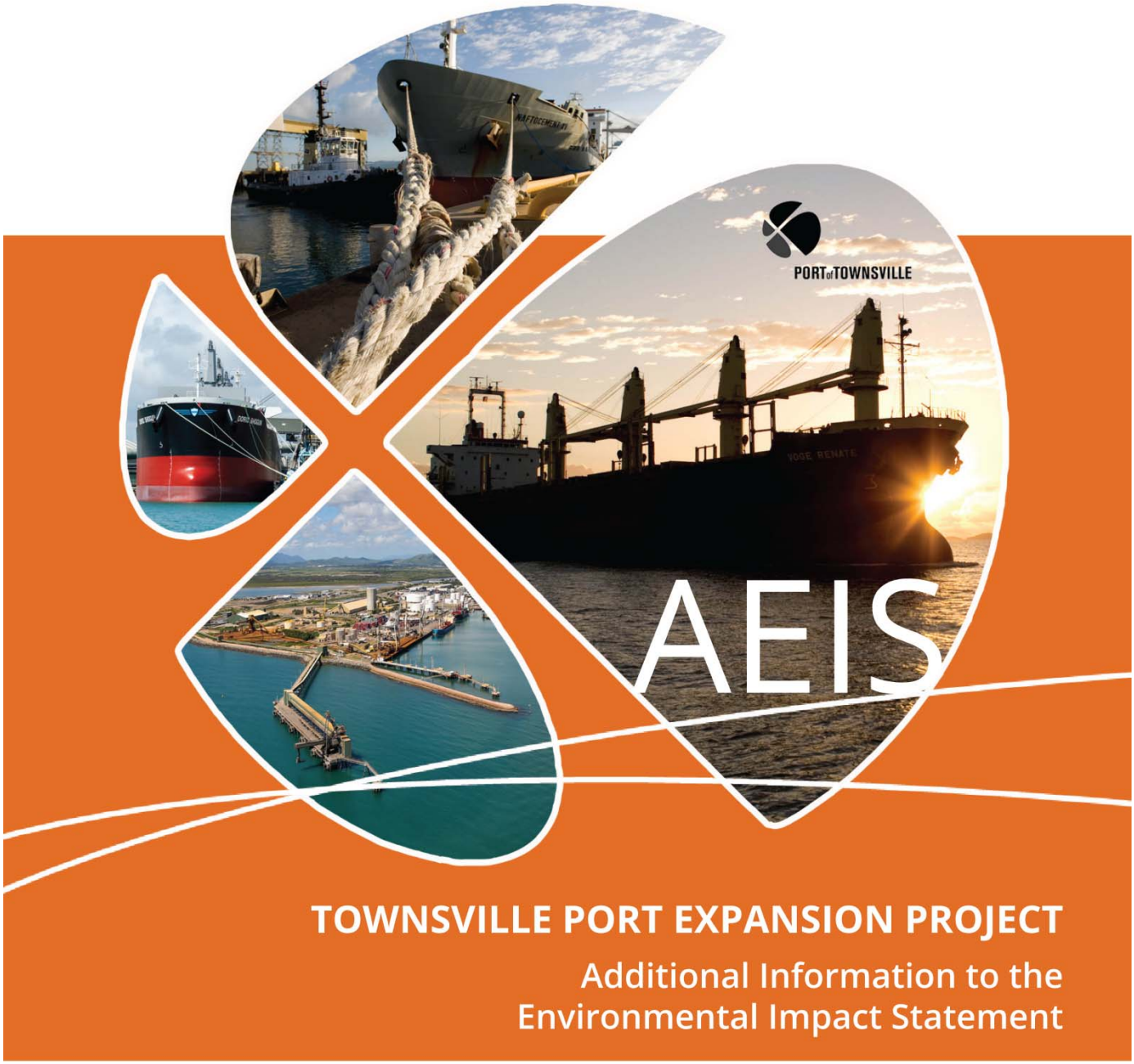

TOWNSVILLE PORT EXPANSION PROJECT

Additional Information to the Environmental Impact Statement

TOWNSVILLE PORT EXPANSION PROJECT

SECTION 9

Terrestrial Ecology

AECOM BMT WBM

9.0 Terrestrial Ecology

9.1 Introduction

Terrestrial ecology values of the Project area and surrounds are described in Chapter B.7 (Terrestrial Ecology) of the Port Expansion Project (PEP) Environmental Impact Statement (EIS). The existing reclamation area provides opportunistic habitat for a number of shorebirds, with various species observed breeding on the existing artificial revetments. Better quality, largely undisturbed habitat is present to the south and outside of the Project area in the form of the Ross River sandspit and mouth. This area is considered a significant breeding, foraging and roosting habitat area for shorebirds in the region. Other intertidal areas in the region also provide habitat opportunities for these species.

The PEP will result in the loss of the existing northern port revetment which is considered to provide opportunistic habitat. The loss is a result of the expansion reclamation area. The expansion will include the construction of a longer revetment area, which may be utilised by frequenting species in the future. The PEP is unlikely to change the sediment deposition patterns of the area to the south of the port, specifically the Ross River sand-spit as discussed in Section B.7.4.2 of the EIS.

This section provides information to address submissions received in response to the PEP EIS relevant to terrestrial ecology. More specifically, key matters raised from the submission process include:

- loss of access to artificial avifauna habitat in the Project area
- degradation of avifauna habitat in the vicinity of the Project area
- disruption to avifauna behaviour and movement patterns
- adequacy of weed and animal pest management
- environmental offsets
- cumulative impacts associated with current and future development of greater region.

Submissions received relevant to offsets are addressed in Section 27.0 of the AEIS.

Section B.7.6 of the EIS addressed cumulative impacts of existing and proposed development in proximity to the Project area relevant to terrestrial ecology. The AEIS has addressed cumulative impacts in line with the *Framework for Understanding Cumulative Impacts Supporting Environmental Decisions and Informing Resilience-Based Management of the Great Barrier Reef World Heritage Area* (GBRMPA Guidelines) (refer Section 25.0 of the AEIS)

9.2 Response to Submissions

9.2.1 Loss of access to artificial avifauna habitat in the Project area

Three submissions raised the loss of access to artificial avifauna habitat in the Project area. The impact to avifauna habitat in the Project area is addressed in Section B.7.3 of the EIS. Shorebirds are capable and known to colonise areas subject to human activity, with some species more tolerant than others (Paton, Ziembicki, Owen, & Heddle, 2000, 37). Constructed breakwaters and revetments in the Port area are used opportunistically by shorebirds for roosting and foraging during certain periods of the day and year. These areas are subject to existing human activity, including boating and vehicle activity, light and noise. They do not form a habitat area considered critical or essential to the long-term viability of any frequenting shorebird species, but rather demonstrate the ability of visiting shorebirds to adapt to disturbed, industrial environments.

Shorebird species utilising opportunistic habitat on site have also been recorded roosting and foraging on naturally occurring intertidal areas to the south and outside of the Project area (e.g. Ross River sandspit) and the wider region. These areas are considered to be of better quality and less disturbed, with the sandspit in particular, providing a significant roosting, foraging and breeding habitat area for shorebird species.

The project design has been with the land reclamation area and associated artificial revetment extended. It is anticipated that construction activities will result in a temporary partial loss of opportunistic shorebird habitat in the Project area as existing breakwaters and revetments are replaced and extended. It is noted that construction activities are limited to the area to the north of the existing reclamation area so that the marine precinct and surrounding area will remain unmodified.

The design is not expected to significantly impact upon shorebird populations or extent of habitat areas in the region. Shorebirds frequenting the Project area are not solely restricted to the Project area and are known, in greater numbers, from nearby higher quality habitat areas such as the Ross River sandspit. Habitat areas in the wider region are capable of accommodating increases in shorebirds as they are often underutilised due to the global decline in shorebird population numbers associated with the loss of a number of global critical habitat areas (Nebel, Portera, & Kingsford, 2008).

Shorebirds roosting and foraging in opportunistic habitat in the Project area will be monitored prior to and during construction activities to identify species and numbers and observe their relocation off site in accordance with the Construction Environmental Management Plan (Appendix B2).

9.2.2 Degradation of avifauna habitat in the vicinity of the Project area

Four submissions raised the degradation of avifauna habitat in the surrounding area, with particular emphasis on Ross River.

The impact to avifauna habitat in the vicinity of the Project area is addressed in Section B.7.3 of the EIS. Shorebird species have been recorded roosting, foraging and breeding on the Ross River sandspit and intertidal areas of Cleveland Bay, with these areas recognised as good quality, naturally occurring habitat.

These habitat areas are located proximate to the Port area, which currently supports operational industrial development and are subject to associated operational disturbance including noise, light and boating activity. Shorebird activity proximate to the Port area, particularly breeding, indicates frequenting species have adapted to these disturbances. Species frequenting close to the Project area are also known to forage, roost and breed in other habitat areas in the wider region and are not considered to rely solely on the Port area or the Ross River sandspit.

The Project construction works will involve the expansion of the reclamation area, which may temporarily disrupt shorebird activity in the vicinity of the Project area; however, the bulk of proposed PEP infrastructure is located to the north, further away from the Ross River sand-spit. Measures to manage light and noise generated during construction and operation of the PEP are outlined in Section 9.2.3.

Potential indirect impacts from changed hydrology and sedimentation as a result of the PEP are discussed in Section B.7.4.2 of the EIS and section 5 of the AEIS. The likely morphological response in the vicinity of the Ross River entrance and the coastline to the east is expected to involve a slight increase in the rate of net sediment accumulation in the area. The propagation of waves from the dominant easterly direction is expected to continue to be unaffected after construction of the new reclamation. Since fine sediments were accumulating in that area already due to the existing Port reclamation and given that the prevailing easterly wave direction is not significantly modified, construction of the new reclamation is not likely to result in any substantive change in the long term morphological condition.

The existing state of shoreline progradation at the Ross River mouth will be maintained under the developed case. The increased extent and shielding of the new reclamation may have the effect of slightly accelerating the rate of progradation, thereby continuing to provide habitat opportunities for avifauna.

One submission also recommended a monitoring program and public awareness campaign to provide the public with information on local biodiversity and species richness of the region. POTL acknowledges this recommendation and has proposed to incorporate this recommendation within its monitoring and awareness programs. Monitoring has been included in the Construction Environmental Management Plan (Appendix B2) and POTL will investigate opportunities to collaborate with local community groups where beneficial.

9.2.3 Disruption to avifauna behaviour and movement patterns

Three submissions raised the impact of noise and light emissions generated from the Project on shorebird roosting and foraging activities on site and in the wider area. Impacts of noise and light emissions are addressed in Sections B.7.4.4 and B.7.4.5 of the EIS. Shorebirds currently reside and forage in and adjacent to the Project area where they are subject to varying and continued industrial noise and vibration and artificial night-time light. Shorebirds have been observed, often in significant numbers, on intertidal areas adjacent to Benwell Road and near the mouth of the Ross River, as well as on existing artificial revetments in the eastern reclamation area, indicating an ability to colonise new and disturbed areas in the vicinity of noise and artificial light generating activities.

Noise and vibration emissions are expected to increase above the average ambient noise level during high-noise generating construction activities such as piling; however, this will occur intermittently over a 20 year construction program. These intermittent noise and vibration emissions are expected to potentially discourage or disrupt bird visitation to the port revetments close to the reclamation. Furthermore, the Project will result in an overall increase in artificial revetment area, providing a net gain in habitat area for those frequenting species over the longer term.

Artificial night time light is also expected to increase with the expansion of port operations; however, modelling indicates this will not increase light levels above natural levels in critical habitat areas due to the siting of proposed infrastructure being to the north-west of known bird habitats (refer to Section B.7.4.5 of the EIS). Light emissions generated from existing port operations have not discouraged migratory birds from roosting and breeding on the existing artificial revetments suggesting an ability to acclimatise to such conditions. This also applies to bats and other nocturnal fauna using habitats along the existing natural shoreline. The PEP alleviates that potential risk by constructing and operating on port land seaward of the existing natural shorelines

Management of noise and light emissions are addressed in Sections B.7.5.3 and B.7.5.4 of the EIS. The Construction Environmental Management Plan (Appendix B2) and the Operational Environmental Management Plan (Appendix B3) will be implemented to manage noise, vibration and light impacts. Measures to mitigate impacts

include using designated transport routes to access site; maintaining plant and equipment; and shielding light sources or orientating light sources / noise-emitting equipment away from foreshore environments, where possible. With the implementation of these measures, the impact to avifauna behaviour in the long-term is considered low.

Submission also requested further information regarding noise and light generated from different projects and operations and along access routes to the port. POTL is responsible for the management of port land and manages noise and light emissions on the boundary of port land only. The management of noise and light emissions on surrounding land including access route is the responsibility of the respective tenant or landholder.

Submissions raised the impact of the Project on distributional ranges of waterbirds and migratory and threatened species. Birds currently residing and / or foraging in or adjacent to the Project area are not highly restricted species. Proposed works will have temporarily localised impacts to roosting and foraging activities and displacement of residing populations on the existing artificial revetment but are not expected to significantly reduce or modify the distributional range of avifauna species.

9.2.4 Adequacy of weed and animal pest management

Two submissions requested further information on how biosecurity will be managed to prevent the introduction and / or reduce the spread of weed and animal pests to surrounding land and fauna habitat areas.

Weed and animal pest management is addressed in Section B.7.4.3 and B.7.5.5 of the EIS. Mitigation measures, monitoring, reporting and corrective action procedures for the management of weeds and animal pests during construction and operational phases are detailed in the Construction Environmental Management Plan (Appendix B2) and Operational Environmental Management Plan (Appendix B3). Measures include but are not limited to enforcing weed wash down procedures for vehicle and plant entering / exiting the site; limiting vehicle and plant movement in known weed infested areas; ensuring imported fill material is weed free; and active control and monitoring of weed infestation and feral animals on site.

POTL is responsible for the management of port land and as such manages weeds and animal pests in the boundary of port land only. The management of weeds and animal pests on surrounding land is the responsibility of the respective proponent or landholder; however, there is a clear benefit to a coordinated approach to managing invasive species on a local and regional scale. POTL will investigate opportunities to work with adjacent proponents and landholders to manage weeds, such as through scheduling of works together.

Previous studies identified weed infestations on land surrounding the port (refer to Section B.7.3.3 of the EIS). With the implementation of mitigation measures outlined in the Construction Environmental Management Plan (Appendix B2) these measures, the risk of introduction and / or spread of weeds and animal pests on port land and to surrounding land from PEP activities are considered low.

9.3 Revised Environmental Impact Assessment

9.3.1 Legislation and policy

No legislation or policy changes occurring since the preparation of the EIS and relevant to the assessment of terrestrial ecology, affect the assessment of these values. Changes to the conservation status of some species previously assessed have occurred since the EIS, these have been updated below.

9.3.1.1 Nature Conservation Act 1992

The protection of threatened species in Queensland is administered through the *Nature Conservation Act 1992*. The *Nature Conservation (Wildlife) Regulation 2006* lists threatened species in Queensland and has been revised multiple times since the preparation of the EIS. These changes to the Regulation applicable to the PEP are summarised in Table 9.1. Changes to offset policies and management are provided in Section 27.0 of the AEIS. The species likelihood table (Appendix L1 of the EIS) has also been updated in order to reflect changes in species status under the *Nature Conservation Act 1992* (refer Appendix A7).

Table 9.1 Changes to *Nature Conservation Act 1992* status of terrestrial fauna species identified in the EIS as occurring or potentially occurring within the Project area

Common Name	Scientific Name	Status*
Common sandpiper	*Actitis hypoleucos*	SL
Australian swiftlet	*Aerodramus terraereginae*	C
Fork-tailed swift	*Apus pacificus*	SL
Cattle egret	*Ardea ibis*	SL
Beach stone-curlew	*Esacus magnirostris*	V
Ruddy turnstone	*Arenaria interpres*	SL
Eastern osprey	*Pandion cristatus*	SL

Common Name	Scientific Name	Status*
Masked booby	*Sula dactylatra*	SL
Red-footed booby	*Sula sula*	SL
Brown booby	*Sula leucogaster*	SL
Glossy ibis	*Plegadis falcinellus*	SL
Sharp-tailed sandpiper	*Calidris acuminata*	SL
Sanderling	*Calidris alba*	SL
Red knot	*Calidris canutus*	SL
Red-necked stint	*Calidris ruficollis*	SL
Great knot	*Calidris tenuirostris*	SL
Greater sand plover	*Charadrius leschenaultii*	SL
Lesser sand plover	*Charadrius mongolus*	SL
Red-capped plover	*Charadrius ruficapillus*	C
Lesser frigatebird	*Fregata ariel*	SL
Common tern	*Sterna hirundo*	SL
Black-naped tern	*Sterna sumatrana*	SL
Bridled tern	*Onychoprion anaethetus*	SL
Little tern	*Sternula albifrons*	SL
White-winged tern	*Chlidonias leucopterus*	SL
Black-faced cuckoo-shrike	*Coracina novaehollandiae*	C
White-bellied cuckoo-shrike	*Coracina papuensis*	C
Eastern reef egret	*Egretta sacra*	C
Black-necked Stork	*Ephippiorhynchus asiaticus*	C
Latham's snipe	*Gallinago hardwickii*	SL
Sooty oystercatcher	*Haematopus fuliginosus*	C
White-bellied sea eagle	*Haliaeetus leucogaster*	C
Brahminy kite	*Haliastur indus*	C
Whistling kite	*Haliastur sphenurus*	C
Grey-tailed tattler	*Tringa brevipes*	SL
Wood sandpiper	*Tringa glareola*	SL
Black-winged stilt	*Himantopus himantopus*	C
Barn swallow	*Hirundo rustica*	SL
Caspian tern	*Hydroprogne caspia*	SL
Crested tern	*Thalasseus bergii*	C
Broad-billed sandpiper	*Limicola falcinellus*	SL
Bar-tailed godwit	*Limosa lapponica*	SL
Black-tailed godwit	*Limosa limosa*	SL
White- billed storm petrel	*Fregetta grallaria grallaria*	C
Star Finch (eastern, southern)	*Neochmia ruficauda ruficauda*	E
Rainbow bee-eater	*Merops ornatus*	SL
Short-tailed shearwater	*Ardenna tenuirostris*	SL
Wedge-tailed shearwater	Ardenna pacifica	SL
Eastern curlew	*Numenius madagascariensis*	V
Little curlew	*Numenius minutus*	SL
Whimbrel	*Numenius phaeopus*	SL

Common Name	Scientific Name	Status*
Ruff	*Philomachus pugnax*	SL
Pacific golden plover	*Pluvialis fulva*	SL
Grey plover	*Pluvialis squatarola*	SL
Rufous fantail	*Rhipidura rufifrons*	SL
Masket owl (northern)	*Tyto novaehollandiae kimberli*	V
Radjah shelduck	*Tadorna radjah*	C
Australian ibis	*Threskiornis molucca*	C
Sacred kingfisher	*Todiramphus sanctus*	C
Common greenshank	*Tringa nebularia*	SL
Marsh sandpiper	*Tringa stagnatilis*	SL
Terek sandpiper	*Xenus cinereus*	SL
Bare-rumped sheathtail bat	*Saccolaimus saccolaimus nudicluniatus*	E
Coastal sheathtail bat	*Taphozous australis*	V
Striped-tailed delma	*Delma labialis*	C
Ornamental snake	*Denisonia maculata*	V
Plant	*Peripleura scabra*	C
Plant	*Solanum sporadotrichum*	C

Status: Common (C) Special Least Concern (SL), Vulnerable (V), Endangered (E)

9.3.1.2 Environment Protection and Biodiversity Conservation Act 1999

Threatened fauna and flora may be listed under Section 178 of the *Environment Protection and Biodiversity Conservation Act 1999*. There have been some updates and additions on the status of protected species relevant for this Project which is reflected in Table 9.2 below.

Table 9.2 Changes to status of *Environment Protection and Biodiversity Conservation Act 1999* listed terrestrial flora and fauna species identified in the EIS as occurring or potentially occurring within the Project area.

Common Name	Scientific Name	Status
White- billed storm petrel	*Fregetta grallaria grallaria*	V
Star finch (eastern, southern)	*Neochmia ruficauda ruficauda*	E
Eastern curlew	*Numenius madagascariensis*	CE
Australian painted snipe	*Rostratula australis*	E
Masked owl (northern)	*Tyto novaehollandiae kimberli*	*V*
Koala	*Phascolarctos cinereus*	V
Bare-rumped Sheathtail Bat	*Saccolaimus saccolaimus nudicluniatus*	CE
Striped-tailed delma	*Delma labialis*	Removed
Ornamental Snake	*Denisonia maculata*	*V*
Shrubby bush pear	*Marsdenia brevifolia*	*V*

Status: Common (C) Special Least Concern (SL), Vulnerable (V), Endangered (E), Critically Endangered (CE)

9.3.2 Design refinement

The project design has been refined as described in Section 2.0 of the AEIS. The design is likely to impact upon terrestrial ecology values through the expansion of the reclamation area, which is expected to create additional artificial habitat that may be opportunistically utilised by shorebird species over the long term.

9.3.3 Supporting studies

Due to several legislative changes of species status, the species likelihood table of threatened, migratory and marine species detected during desktop reviews and site surveys was revised based on desktop review (Appendix A7). No other additional studies were necessary in the assessment of the design.

New Protected Matters and Wildlife Online Searches were undertaken on the 28th of January 2016, in order to address potential legislative changes that might have occurred since the AEIS. The Protected Matters Search was based on a central coordinate of the PEP, with a 5km buffer. The Wildlife Online Search was based on the following

coordinates (Latitude: 19.2158 to 19.2746 Longitude: 146.8107 to 146.8776) as this captures the expanded reclamation footprint of the Project area.

9.3.4 Revised assessment

9.3.4.1 Impact assessment

Impacts associated with the design are expected to be similar to that identified in Section B.7.4 of the EIS, with the exception of the creation of additional artificial habitat.

Table 9.3 Summary of change in artificial revetment structures with design

Artificial Revetment / Breakwater Structures in Outer Harbour	Length of created structure	Loss of existing structure	Net Gain
Overall length - EIS layout	5,120m*	1,280m	3,840m
Overall length - AEIS design layout	5,700m*	1,090m	4,610m
Increase from EIS to AEIS layout		770m	

* Including 1.0 km Western Breakwater, if Western Breakwater is required.

Table 9.4 Summary of change in artificial reclamation areas with refined design

Reclamation / Settlement Pond Area in Outer Harbour	Area Gained (Approx.)
Overall area created by EIS layout	100ha
Overall area created by AEIS refined layout	150ha

A total net gain of approximately 150 ha of reclamation area / settlement pond area in outer harbour (Table 9.5) and 4,240 m of artificial revetment area (Table 9.3) will be created as part of the design.

9.3.4.2 Mitigation measures

Mitigation measures to reduce the impact on the Project on terrestrial ecological values are outlined in the updated Construction Environmental Management Plan (Appendix B2) and Operational Environmental Management Plan (Appendix B3) of the AEIS and summarised in Table 9.5.

9.3.5 Summary

Table 9.5 provides a summary of the mitigation measures proposed to reduce impacts of the Project on terrestrial ecological values.

Table 9.5 Summary of Terrestrial Ecology Impacts and Mitigations Measures

Element	Primary Impacting Process	Updated Risk Rating			Mitigation Measures ^	Mitigated Risk Rating
		Magnitude	Likelihood of impact	Risk Rating		
Injury and / or loss of fauna through vehicle / machinery movement.	Construction / Operation	High	Possible	Medium	Limit speed of vehicles. Limit vehicle use to designated access routes.	Low
Loss of access to artificial avifauna habitat.	Construction of breakwaters and reclamation	Moderate	Almost Certain	High	Recreate and extend constructed breakwater and revetment areas.	Low
Degradation of avifauna habitat in vicinity of Project area.	Construction of breakwaters and reclamation	Moderate	Possible	Medium	Weed and animal pest management on site. Sedimentation and water quality monitoring.	Low
Noise / vibration or light emissions leading to disruption to fauna behaviour / movement patterns.	Construction of breakwaters and reclamation	Moderate	Likely	Medium	Maintain plant equipment and machinery. Use low-noise equipment where possible. Orientate light / noise-emitting equipment away from foreshore. Shield light sources.	Low
Introduction and / or spread of weeds.	Construction of breakwaters and reclamation	Moderate	Possible	Medium	Mandatory weed wash down for at risk vehicles or activities. Limit vehicle movement through weed infested areas. Ensure imported fill material is weed free. Active control and monitoring.	Low
Introduction and / or spread of animal pests.	Construction of breakwaters and reclamation	Moderate	Unlikely	Low	Active control and monitoring.	Low
Noise / vibration emissions leading to disruption to fauna behaviour / movement patterns.	Operation	Minor	Possible	Low	Use low-noise equipment where possible. Adhere to noise restrictions. Maintain plant equipment and machinery.	Low

9.4 Conclusion

The PEP is not expected to significantly impact upon terrestrial ecological values on the Project site or in surrounding areas. POTL has committed to undertake monitoring prior to and during the construction stage of the PEP and where beneficial, collaborate with local community groups. With the implementation of mitigation measures as described above in Table 9.5 and in the Construction Environmental Management Plan (Appendix B2) and Operational Environmental Management Plan (Appendix B3), the overall impact to terrestrial ecology is considered low.