



13 ENVIRONMENTAL ASSESSMENTS AND APPROVALS

CHAPTER SUMMARY AND CONCLUSIONS:

- An Environmental Assessment Report (EAR), including a Review of Environmental Factors (REF) and Environmental Management Plan (planning) (EMP (P)), have been prepared for the project according to the Department of Transport and Main Roads' (TMR) Environmental Processes Manual (2013).
- The majority of the TEARC corridor is accommodated on freehold land owned by the Co-ordinator General and designated for the purposes of materials transportation / services corridor precinct within the TSDA. The corridor includes unallocated state land associated with Ross River crossing, Crown leasehold lands near and within the port of Townsville and road reserves.
- Extensive sections of the project study area are heavily impacted by clearing, fire and weed infestation from past or current adjoining land uses.
- Unless native title is to be resumed, carrying out the Project in these areas will require compliance with Part 2, Division 3 of the Native Title Act 1993 (Cth). There are two registered Native Title Claims covering the extent of the project area, namely the Bindal People #2 (QC2016/005) and the Gurambilbarra Wulgurukaba People (QC2016/007).
- There are a number of sites within the broader project area that are of cultural significance to the local Aboriginal and Torres Strait Island Peoples. Most notable being the landscape features and sand dunes around the Ross River. Three areas of European (post-contact habitation) Heritage including the former Townsville City Council sewerage treatment works (abandoned), the heavy anti-aircraft gun station installation and camp sites and the Ross River tidal flats where Japanese bombs impacted during WW2.
- Liaison with the registered native title claimants for Bindal people #2 and Gurambilbarra Wulgurukaba will be required to determine the requirements for complying with the cultural heritage duty of care under the Aboriginal Cultural Heritage Act 2003.
- If an EIS is to be required for the Project, this liaison will need to include development and approval of cultural heritage management plans under Part 7 of the Aboriginal Cultural Heritage Act 2003 with each of the registered native title claimants for Bindal people #2 and Gurambilbarra Wulgurukaba.
- Potential residual sources of land contamination from past or present activities have been identified and there is a risk of unexploded ordnances (UXO) from the first Japanese air raid in 1942 near the mouth of Ross River.
- Due to the diversion of freight rail traffic to the Project line Rail, 765 sensitive receivers on the existing rail line are expected to receive a typical 3 dB decrease in rail noise. Increased rail noise is expected within the Cluden residential area and some areas of South Townsville near to the port however none of the 927 assessed sensitive receptors are expected to experience noise impacts that exceeds the Queensland Rail Code of Practice LAeq 24hour rail noise criteria targets.
- Based on the predicted freight movements, it is expected that there will be negligible impacts on existing air quality including particulate emissions or gaseous pollutants and emissions are not expected to exceed the Air EPP criteria at the nearest sensitive receptor.



- Potential construction and operational impacts addressed in the EAR include:
 - Impacts to terrestrial and aquatic flora and fauna through clearing of vegetation and loss of habitat, fauna injury/mortality, disturbance of fauna and fish passage and management of weeds.
 - Impacts to the ambient environment.
 - Impacts to surface, wetland and marine water resources sources through degradation of water quality and disruption of coastal processes and downstream flows.
- Unavoidable impacts as a result of the TEARC project mainly include the loss of marine vegetation, migratory bird and fauna habitat, the restriction of movement of aquatic species, and the disturbance of areas that may contain potential acid sulfate soils (particularly the land reclamation within the port area and near the eastern side of SPR at the mouth of the Ross River).
- The EMP (P) provides a broad range of mitigation measures to protect environmental values in the Project area, inclusive of offsets. These strategies will require further investigations, field work and management plans to be developed at various stages of the Project.
- The Project will trigger a Referral and Approval of a controlled action under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act), as well as a number of tier two statutory approvals.

13.1 Overview

An environmental assessment was undertaken to ensure that the project fulfilled its legal responsibilities and appropriately managed environmental risks. An Environmental Assessment Report (EAR), including a Review of Environmental Factors (REF) and Environmental Management Plan (planning) (EMP (P)), have been prepared for the TEARC project in accordance with the Department of Transport and Main Roads' (TMR) Environmental Processes Manual (2013). The purpose of the EAR was to undertake selected desktop and site environmental investigations to provide recommendations to inform the development of the business case, detailed design and implementation phases of this major infrastructure project.

The Environmental Assessment Review delivers:

- Detailed information on the existing environmental factors of the site relevant to the project (Review of Environmental Factors (REF)), and a comprehensive assessment of the likely impacts of the project on those factors.
- Recommendations for design and construction management (EMP(P)) to sufficiently avoid, mitigate, manage or offset the impacts of the project that have been identified within the (REF).
- Legislative approvals triggered by the project and actions required.
- Other legislative requirements and compliance strategy.

The environmental review was also separately supported by the following reports:

- Noise and Vibration Assessment
- European Cultural Heritage Report
- Indigenous Cultural Heritage Desktop Study and Cultural Heritage Risk Assessment.



13.2 Methodology

The method adopted for the Review of Environmental Factors (REF) was based on the Business Case guidelines and TMR Environmental Processes manual. Desktop assessment involved searches of available databases and reviews of previous studies and background reports. This information also informed a number of field surveys. The review, alongside a field validation ecology survey and noise monitoring, have helped to classify the project's potential environmental risks and identify relevant environmental legislation. These risks, as well as the significance of their likely impacts, are summarised below.

13.3 Key findings

The key potential impacts of the construction and operation of TEARC are summarised below.

Table 13.1 Environmental Impacts Summary

ASPECT	CONSIDERATIONS
Legislation and Permit Requirements	<p>The project has considered the approvals and compliance requirements to undertake this project. Relevant Acts include:</p> <ul style="list-style-type: none"> ▪ <i>Aboriginal Cultural Heritage Act 2003</i> ▪ <i>Biosecurity Act 2014 and Biosecurity Regulation 2016</i> ▪ <i>Coastal Protection & Management Act 1995</i> ▪ <i>Environmental Offsets Act 2014</i> ▪ <i>Environmental Protection Act 1994</i> ▪ <i>Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)</i> ▪ <i>Fisheries Act 1994</i> ▪ <i>Native Title (Queensland) Act 1993</i> ▪ <i>Nature Conservation Act 1992</i> ▪ <i>Planning Act 2016</i> ▪ <i>State Development and Public Works Organisation Act 1971</i> ▪ <i>Transport Infrastructure Act 1994</i>



ASPECT	CONSIDERATIONS
<p>LEGISLATION AND PERMIT REQUIREMENTS (CONTINUED)</p>	<p>The TEARC Project will trigger a Referral and Approval of a controlled action under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act). Due to the nature and scale of the project, and the sensitivities of the receiving environment, the EPBC Act approval will likely trigger assessment by an EIS process.</p> <p>Matters of National Environmental Significance (MNES) expected to be impacted by the Project include:</p> <ul style="list-style-type: none"> ▪ The Great Barrier Reef World Heritage Area as a World Heritage property and National Heritage place ▪ The Great Barrier Reef Marine Park ▪ Listed threatened species (41) and threatened ecological community (1) ▪ Listed migratory species (63). <p>The TEARC rail and road infrastructure is located predominantly within the designated materials transportation/services corridor precinct of the Townsville State Development Area (TSDA); with a portion, north of the Ross River located within the Strategic Port Land. South of the Ross river the rail is positioned within the designated materials transportation/services corridor precinct of the TSDA development scheme 2013 and is consistent with the preferred land use intent. North of the Ross river the rail line is consistent with the future rail identified within the Port of Townsville Land Use Plan 2013 maps within the Port Industry land zone. It is therefore unlikely that the TEARC Project would require an MCU approval under the TSDA development scheme 2013 or the Port of Townsville Land Use Plan 2013. Further engagement and consultation with the Department of State Development and Port of Townsville should be undertake during the next project phase to confirm.</p> <p>The following tier two statutory approvals are likely to be triggered by TEARC:</p> <ul style="list-style-type: none"> ▪ Operational works for tidal works (prescribed tidal works) ▪ Operational works for waterway barrier works ▪ Self-assessable waterway barrier works ▪ Operational work that is the removal, destruction or damage of a marine plant. <p>The project also has the potential to trigger environmental offset obligations. Further evaluation of the triggered environmental offset obligations is required, particularly within the context of the biodiversity management environmental reserves established under the EPBC Act approval and wider infrastructure corridor planning for the TSDA as part of the SPR project.</p>



ASPECT	CONSIDERATIONS
<p>Planning and Land Use</p>	<p>Freight heavy haul railway infrastructure that activates future development precincts within the Townsville SDA and improves rail access to the Port of Townsville and its future eastern expansion areas is very important to the region. This form of infrastructure development is consistent with the region’s objectives to become a prime future industrial transportation and distribution services centre for north Queensland, and improve urban amenity values within the city’s southern fringes.</p> <p>The TEARC corridor aligns with land designated for the purposes of materials transportation / services corridor precinct within the TSDA.</p> <p>The project is adjacent to other existing linear infrastructure including SPR, Powerlink 132KV powerline, large intact environmental conservation / reserve land areas, industrial uses, vacant future industrial uses and within 350m of existing residential land near Cluden, Oonoonba and South Townsville.</p> <p>There are also a number of national parks and protected areas in proximity to the alignment including Cleveland Bay, part of Bowling Green Bay National Park, which is a Ramsar convention listed site (a wetland of international significance), and the Great Barrier Reef World Heritage Area.</p> <p>Special care must be taken to identify any Unexploded Ordinances (UXOs) – remnants from WWII – that may possibly lie within the rail corridor. Survey of UXOs should be undertaken prior to development, as the removal of any discovered UXOs may require detonation, potentially disturbing soils, vegetation and surrounding fauna.</p> <p>The project is consistent with the preferred land use intent for the TSDA development scheme, and it is anticipated that the rail line and road works will be consistent with the Port of Townsville Land Use Plan 2013.</p>
<p>Property and Tenure Impacts</p>	<p>The majority of the TEARC corridor aligns with the existing transport corridor, which runs through the TSDA. This corridor is freehold land owned by the Co-ordinator General. The only unallocated state land impacted will be associated with Ross River crossing. The corridor also includes state leasehold lands near and within the port of Townsville and road reserves. There is likely to be the need for some property acquisition near the Cluden Y junction, along Racecourse Rd and within the Port precinct. Property impacts are described in more detail in the Reference Project (Chapter 5).</p> <p>To the extent that the Project will be undertaken in areas where native title may continue to exist, including in relation to the natural waterways crossed by the alignment (including Ross River), compliance with an applicable provision of Part 2, Division 3 of the <i>Native Title Act 1993</i> (Cth) will be required. There are two Native Title Claims covering the extent of the project area including the Bindal People #2 (QC2016/005) and the Gurambilbarra Wulgurukaba People (QC2016/007).</p>
<p>Topography, Geology and Soils</p>	<p>The rail corridor traverses the generally low-lying, flat floodplain of the Ross River and tidally influenced areas. The project area is prone to erosion due to storm event inundation and long-term trends including sediment supply deficit and channel migration. It is likely that some of the expansive soft clay and grey sand around Ross River will require lime treatment if disturbed to preserve the integrity of structures positioned upon them.</p> <p>Due to the low coastal elevations, there is high likelihood of the presence of potential or actual acid sulphate soils. Detailed site investigations and an Acid Sulphate Soil Management Plan will be required at or prior to the detailed design phase of the project.</p> <p>Some sources of contamination were also identified via desktop assessment, and will require further investigation at the detailed design phase.</p>



ASPECT	CONSIDERATIONS
<p>Hydrology and Water Quality</p>	<p>The project corridor crosses the mouth of the Ross River and tributaries of Gordon Creek and Stuart Creek, extending through coastal saltmarsh flood plain areas.</p> <p>The placement of the rail embankment across waterways and the associated tidal floodplain has the potential to affect hydrological flows and flood inundation.</p> <p>Waterway crossings and potential diversions may lead to changes in hydrological flow volumes and velocities, diverted channels, and altered tidal influence and inundation areas on either side of the rail embankment. However, the appropriate use of bridges and culverts for waterway crossings should minimise alterations to patterns of freshwater flow and tidal inundation, thereby reducing risks to upstream areas and ecosystems across the floodplain.</p> <p>Water quality impacts during the construction and operation phases of the project will also require management. The greatest risks arise from construction activities, and the possibility of sedimentation caused by disturbance and erosion.</p>
<p>Flora and Fauna</p>	<p>The Project intersects eight regional ecosystems (RE), the majority of which are severely affected by weed invasion. One of these REs (RE 11.2.1) 'of concern' is also a listed essential habitat area. The reference design will intersect a total of 1.9hectares (within a 13.4hectare parcel) of RE 11.2.1.</p> <p>A total of 35 flora species, including four vulnerable species, listed under the Nature Conservation Act (NC Act) and EPBC Act have been identified within the Project area through desktop studies. Due to the large weed infestation within the project area, removal of flora in certain areas may not cause any considerable damage, and could in fact improve the remnant vegetation through weed removal. The removal of weeds off-site will need to follow weed hygiene protocols.</p> <p>The EPBC Act and NC Act searches produced 239 fauna species that may potentially be present within the Project area. This includes 45 migratory species, five of which are listed as threatened. There is potential to disturb and remove the habitats of vulnerable and endangered fauna species, and injure or kill fauna during construction. These risks will need to be managed.</p> <p>The Project impacts on the black-throated finch are considered minimal as the existing weed infestation is such that the project has the capacity improve the existing habitat through rehabilitation of the surrounding area.</p> <p>Impacts on the water mouse, if it is present, would include loss of nesting habitat, loss, and fragmentation of foraging habitat. The project corridor intersects these areas to some degree in the broad intertidal area that extends south of Ross River.</p> <p>The project corridor has the potential to impact mudflats to the east of the mouth of the Ross River that currently provide high value foraging habitat for Great Knot, Red Knot, Eastern Curlew and the Western Alaskan bar-tailed godwit. However, the impact is unlikely to be long-term given the dynamic nature of intertidal environments. If the rail bridge has no impediment to tidal flows, the impact on foraging habitat is likely to be negligible in the long-term.</p> <p>The impacts of the construction of the bridge over Ross River on aquatic ecology was also studied. The rail bridge will be supported by piles driven into the riverbed and adjacent intertidal areas. It is likely that a number of sensitive species will be affected in the short term during this construction activity, which may disturb Acid Sulfate Soils (ASS) and local flora and fauna, as well as generate noise. Underwater noise can impact the Snubfin and Humpback dolphins that use the area adjacent to the mouth of the Ross River intensively throughout the year for calving and other activities.</p> <p>Cross drainage structures will require detailed consideration of local hydrological regimes to mitigate changes to stream conditions during peak flow periods and maintain fish passage.</p>



ASPECT	CONSIDERATIONS
Air Quality	<p>Construction emissions include pollutants from equipment emissions and dust from the disturbance, exposure and transportation of soils. Potential operational emissions include the running of the trains along the tracks, increasing local air emissions. Air emissions associated with trains are predominantly from diesel exhausts along the railway line.</p> <p>The project is predominantly located near areas planned mainly for emission intensive industrial activities, such as a highway, bulk materials handling or processing as well as port related industry precincts. Based on the predicted freight movements, it is expected that there will be negligible impacts on existing air quality including particulate emissions or gaseous pollutants from diesel engine exhausts, emissions from load, and recirculated dust beyond 50m of the alignment. Therefore, adverse air quality impacts are not expected to exceed the Air EPP criteria due to the separation distance from the rail alignment and the nearest sensitive receptor being more than 350 metres.</p>
Noise and Vibration	<p>There are a number of sensitive receptors within proximity to the alignment who will receive freight traffic closer to their properties, resulting in potential disruptions. However, TEARC will divert a significant amount of freight rail traffic away from the Abbott Street corridor, which will reduce noise and other impacts for residents in that area.</p> <p>The primary impacts will likely encompass:</p> <ul style="list-style-type: none"> ▪ Increased noise and vibration during construction and operation, affecting developed areas around Cluden and the Port of Townsville. ▪ Increased noise and vibration during construction and operation, impacting natural vegetated areas and fauna habitats between the existing SPR and Cluden. ▪ Increased noise and vibration during construction of the bridge across Ross River, potentially impacting marine fauna and nearby shorebird habitat. <p>Predictive noise modelling of rail noise levels at 927 sensitive receivers at Cluden and South Townsville near the port was undertaken for six freight traffic scenarios. Outputs indicate that the 765 sensitive receivers on the existing rail line are expected to receive a typical 3 dB decrease in rail noise due to the rail traffic diverted to the Project line; while rail noise levels are predicted to increase within the Cluden residential area and some areas of South Townsville near to the port. However, noise level increases are still predicted to remain well below the 65dB LAeq 24hour average daily criteria target per the Queensland Rail Code of Practice.</p>
Landscape and Visual Amenity	<p>Many of the aesthetic values along the project alignment are derived from areas of open space and environmental conservation – particularly the mangrove communities along the shoreline, which provide essential habitat for shore fauna. Therefore, the construction of a railway line will affect the visual amenity of the area to some extent.</p> <p>The nearest residence will have an obscured view of the alignment due to an industrial site and an area of remnant vegetation separating the tracks from the residential area.</p>
Waste Management	<p>All contaminated land to be removed off site will be disposed of appropriately and in accordance with relevant legislative and/or policy requirements including the <i>Environmental Protection Act 1994</i>.</p>



ASPECT	CONSIDERATIONS
<p>European Cultural Heritage</p>	<p>There are a number of European (post-contact habitation) Cultural Heritage sites adjacent to the project corridor. These include:</p> <ul style="list-style-type: none"> ▪ The former Townsville City Council sewerage treatment works (abandoned). ▪ The former heavy anti-aircraft gun station installation and camp sites. ▪ The Ross River tidal flats impacted by Japanese bombs dropped during WWII. <p>The corridor does not pass through locations that are currently listed in the Townsville City Council, National Trust, Queensland Heritage Register or National Heritage Registers.</p> <p>As the project runs largely within a defined corridor that has already experienced some clearing and disturbance from previous developments, it is unlikely that significant artefacts will be unearthed during the construction phase.</p>
<p>Aboriginal Cultural Heritage</p>	<p>There are a number of culturally significant sites within the project area. The area would have been used as a valuable resource for food and stone collection up until European settlement. The cultural heritage surveys undertaken for the Townsville Port Access Road project identified several sites of Aboriginal Cultural Significance present in the area, including a low-density shell scatter, a scatter of stone artefacts and a small cluster of bone (later identified as macropod bone). Further field studies undertaken in 2005 identified additional sites along the beach ridges that run along the east and south coast of the Ross River. The sand dunes on the south bank of the Ross River and the Ross River crossing hold great cultural significance to the traditional owners and are therefore, highly sensitive areas.</p> <p>The boundary between the two Native Title Claim Areas is the mid-point of the Ross River, which is a culturally significant site relating to the creation story. Careful cultural heritage management will be required at this site, in particular, to facilitate the rail bridge construction across this river.</p> <p>Liaison with the registered native title claimants for Bindal people #2 and Gurambilbarra Wulgurukaba will be required to determine the requirements in meeting for complying with the cultural heritage duty of care guidelines under the Aboriginal Cultural Heritage Act 2003.</p> <p>If an EIS is to be required for the Project, this liaison will need to include development and approval of cultural heritage management plans under Part 7 of the Aboriginal Cultural Heritage Act 2003 with each of the registered native title claimants for Bindal people #2 and Gurambilbarra Wulgurukaba.</p>



ASPECT	CONSIDERATIONS
<p>Environmental Management</p>	<p>Potential impacts associated with Project activities have been managed in two ways. Following the REF framework to protect environmental values within the project area, the MCA option selection process recommended the alignment with the least environmental disturbance. Secondly, mitigation and/or management measures, as described in the EMP (P), have been incorporated into the reference design.</p> <p>The EMP (P) provides a broad range of mitigation strategies to protect environmental values specific to the Project area, inclusive of offsets. This plan has identified a number of future environmental activities, recommendations and forward work plans which will likely be required during the next phases of the project. These include:</p> <ul style="list-style-type: none"> ▪ Species management plans (likely to be for dolphins, dugongs, turtles, shorebirds and potentially others) ▪ Queensland Offsets Development Plan ▪ EPBC Act Offsets strategy ▪ Stakeholder engagement plan ▪ Erosion and sediment control plan ▪ Acid sulfate soils management plan ▪ Contaminated land Stage 1 Site Investigations and management plan ▪ Vegetation management plan ▪ Cultural heritage management plan ▪ Noise and Vibration Management Plan ▪ Air quality Management Plan ▪ Site based stormwater management plan ▪ Waste management plan ▪ Weed management plan ▪ Fauna management plan <p>The EMP (P) also provides a summary of impacts and associated risk ratings. Residual risk ratings are assigned to impacts based on the full implementation of the recommendations provided.</p>
<p>Climate Change</p>	<p>Flood Immunity (Vertical Grade) Provisions</p> <p>TEARC design planning levels have been established based on the following:</p> <ul style="list-style-type: none"> ▪ Within the coastal areas, design level criteria have been based on TCCs adopted Design Storm Tide event levels in accordance with the City Plan 2014 provisions. The current City Plan 2014 provisions necessitate design planning levels which are higher compared to what otherwise applied under the former 2005 scheme; and ▪ In floodplain areas, design planning levels are based on TCCs DFE but which additionally includes conservative allowances made in respect to climate change (2100 planning timeframe), un-mitigated catchment development and inclusion of the ultimate TSDA strategy. The TEARC design planning levels have been established to “future proofing” the TEARC infrastructure and is considered appropriate.