

Appendix C Environmental Management Plan



Environmental Management Plan (Planning)

Beerburrum to Nambour Rail Upgrade Project (B2N Project)

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1 Introduction

1.1 Purpose

In accordance with the Department of Transport and Main Roads' (TMR) Environmental Processes Manual (2013), the purpose of the Environmental Management Plan (Planning) (EMP(P)) is to provide recommendations to be considered during the development and implementation phases of an infrastructure project. These recommendations aim to sufficiently avoid / mitigate / manage the impacts of the B2N Project that have been identified within the Review of Environmental Factors (REF) and nominate any other investigations needed to support of the detailed design development.

This EMP(P) provides a summary of potential impacts and associated risk ratings together with recommendations to inform future stages of detailed design and also to identify where further investigations will be required to support approvals processes. It was updated in October 2019 in conjunction with an update to the REF.

1.2 Project Background

The Beerburrum to Landsborough section of the North Coast Line is part of the Australian Government's National Land Transport Network. This section of the North Coast Line caters for a complex mix of traffic with various operating characteristics and stopping patterns, including:

- High speed tilt trains
- Commuter services
- Long distance passenger services
- Containerised freight services
- Heavy haulage single commodity trains
- Historic recreational services
- Cattle trains.

This section of the North Coast Line is forecast to experience the second highest passenger growth rate on the Southeast Queensland (SEQ) network, however the ability to effectively meet passenger and freight transport demand is hindered by its predominantly single track configuration and poor horizontal and vertical alignment.

The Beerburrum to Nambour Rail Upgrade Project (B2N Project) builds upon work originally commenced under two separate programs, being:

- Caboolture to Landsborough Rail Project (C2L Project)
- Landsborough to Nambour Rail Project (L2N Project).

1.3 Project Scope

The B2N Project is located in the Sunshine Coast Hinterland, between Beerburrum and Landsborough. It involves:

- Duplication of the North Coast Line between Beerburrum and Landsborough
- Upgrade of existing stations at Mooloolah Valley, Eudlo, Palmwoods and Woombye
- Road realignments where the local road network is impacted by the duplication
- Removal of the existing Barrs Road and Caloundra Street level crossings and replacement with grade separation
- Passing loop extensions north of Landsborough Station, south of Eudlo Station and south of Woombye Station
- Expansion of Park and Ride facilities at Beerburrum, Landsborough, Palmwoods and Nambour Stations.

The B2N Project will also require new or extended crossings of waterways including Tibrogargan, Coonowrin, Coochin, Blue Gum, Mellum, Addlington and Acrobat Creeks, with crossing structures intended to facilitate fauna passage. Several existing culverts and bridges will be removed from redundant sections of the existing rail corridor once the new corridor is operational.

Passing loops north of Landsborough to Nambour will be located within the existing North Coast Line rail reserve, with station upgrades planned at the current station locations.

The expansion of Park and Ride facilities will occur predominantly within rail reserve, however some additional land may be required.

Road realignments proposed between Beerburum and Landsborough extend beyond the protected corridor. These include realignments at Beerburum St/ Red Road/ Steve Irwin Way, and also Berteaus Road/ Caves Road, near the Matthew Flinders Rest Area and State Forest Nursery. Steve Irwin Way will also require realignment to the east between the Matthew Flinders rest area and Moffats Road.

Project elements are summarised in Table 1.

Table 1: Project elements

LOCATION	PROJECT ELEMENTS
Beerburum Station	<ul style="list-style-type: none"> Expansion of Park and Ride facilities
Beerburum to Glass House Mountains Station	<ul style="list-style-type: none"> Duplication on improved alignment within the existing and protected corridor. Road realignments at Beerburum St/ Red Road/ Steve Irwin Way, Berteaus Road/ Caves Road and the Steve Irwin Way between the Matthew Flinders Rest Area and Moffats Road. Bridges/ structures at Tibrogargan Creek Replacement of Barrs Road Level Crossing, with a road bridge over Coonowrin Creek and new connection to Coonowrin Road on the west of existing railway. Reconstruction of the Burgess Street road bridge south of its current location. Provision of fauna passage at new bridges and culverts
Glass House Mountains to Landsborough	<ul style="list-style-type: none"> Duplication of the existing alignment within the existing rail corridor. Provision of fauna passage where practical at new or extended culverts
Landsborough Grade separation	<ul style="list-style-type: none"> Replacement of Caloundra Street level crossing with grade separation (road over rail bridge) to the south of the existing level crossing, crossing old Landsborough road and connecting into Stephens Street/ Maleny Street.
Landsborough Park and Ride	<ul style="list-style-type: none"> Extension of Landsborough station car parking on western side of station New Park and Ride facilities on the eastern side of the station
Landsborough Passing Loop	<ul style="list-style-type: none"> Extension of the duplicated track (passing loop) from Gympie Street North for approximately 1km, entirely within the existing rail corridor. A new/extended crossing of Addlington Creek will be required. Passing loop works end at a point between the two sections of Dularcha National Park, with no physical intrusion into the National Park boundary.
Mooloolah Station	<ul style="list-style-type: none"> Station upgrade to replace existing platform with dual platforms connected by lifts and overbridge The existing timber overbridge will remain in situ
Eudlo bridge replacement and passing loop	<ul style="list-style-type: none"> Extension of the passing loop south of Eudlo Station, and replacement/ duplication of the Highland Road/ Acrobat Creek rail bridge.
Eudlo Station	<ul style="list-style-type: none"> Station upgrade to replace existing platform with dual platforms connected by lifts and overbridge Federation Walk has been identified as a spatial constraint to station layout.
Palmwoods Station	<ul style="list-style-type: none"> Station upgrade to replace existing platform with dual platforms connected by lifts and overbridge Expansion of Park and Ride facilities Reconfiguration of track to improve train operations

LOCATION	PROJECT ELEMENTS
Woombye passing loop	<ul style="list-style-type: none"> Extension of the passing loop south of the station, to integrate with the new Woombye stabling yard.
Woombye Station	<ul style="list-style-type: none"> Station upgrade to replace existing platform with island platform connected by lifts and overbridge
Back Woombye Road	<ul style="list-style-type: none"> Closure of eastern section of Back Woombye Road, and extension of Barts Street to connect at road underpass (height restricted bridge remains)
Nambour	<ul style="list-style-type: none"> Expansion of Park and Ride facilities on the western and eastern sides of Nambour Station.

1.4 Project Delivery

Pre-construction activities for the B2N Project have commenced. Current funding is insufficient to complete all features identified in the Business Case, and the timing for delivery and any staging of construction works will be finalised, confirmed and communicated through the Detailed Design phase. It is assumed that the Department of Transport and Main Roads (TMR) will be responsible for future stages of design delivery, should the B2N Project proceed past the Business Case phase. In the event that TMR is not responsible for the delivery of the B2N Project, the EMP(P) will be updated to reflect the relevant proponent.

1.5 Environmental Assessment Process

Environmental investigations were undertaken in support of the preparation of the REF and this EMP(P). The REF describes the existing environmental and heritage values within the Project Area, it identifies and assesses potential impacts of the B2N Project proposal, and proposes management and mitigation measures. The REF also describes the methods adopted and investigations undertaken to support preparation of the REF, and highlights residual matters requiring further investigation, assessment, management or mitigation in future stages of project development and implementation.

This EMP(P) provides a summary of the impacts, their associated risk ratings and subsequent mitigation recommendations. The EMP(P) is divided into two sections as follows:

- **Legislative Compliance** – this identifies the likely legislative processes that will be triggered by the B2N Project, including actions to be undertaken to fill the requirement. Indicative timeframes are provided so the scheduling of these actions can be accommodated in the overall B2N Project schedule. Application costs are revised annually, and would require review at the time of application under the relevant act or regulation.
- **Mitigation Measures and Strategies** – this provides recommendations to be considered during the Detailed Design process to ensure environmental impacts associated with the location, design and / or operation of the B2N Project are minimised.

Impacts and opportunities have been assessed against TMR's risk evaluation criteria provided in Appendix A .

2 Legislative Compliance

Legislative requirements relevant to the B2N Project and recommended actions to fulfil those requirements are identified in Table 2. Allocated responsibilities are indicative and will be confirmed in future stages of implementation.

Table 2: Relevant legislative requirements for the B2N Project

LEGISLATIVE REQUIREMENT/ TRIGGER	REGULATORY AUTHORITY	RECOMMENDED MITIGATION MEASURE/ STRATEGY	INDICATIVE TIMEFRAMES AND COSTS
Commonwealth Approvals			
<i>Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)</i>			
EPBC Act Referral and Assessment Significant impacts to Matters of National Environmental Significance (MNES) protected under Section 18 and 18A, Part 3 of the EPBC Act triggers the need for referral to the Department of the Environment and Energy to determine whether the B2N Project (the proposed action) constitutes a ‘controlled action’. Note that previous referrals of the Beerburum to Landsborough (B2L) and Landsborough to Nambour (L2N) Rail Corridor Projects resulted in not controlled actions.	Department of the Environment and Energy (DEE)	TMR/QR Responsibilities It is recommended that TMR prepare and submit a referral for the B2N Project to address the potential for significant impacts to MNES including Threatened Ecological Communities (TECs), threatened flora, threatened and migratory fauna. Initial flora and fauna survey and assessment indicated the potential presence of MNES in the Project Area. However, it is identified that significant impacts are not anticipated, but further targeted flora surveys and frog surveys are recommended to comprehensively confirm this conclusion. Further documentation in an EPBC Act Referral would address this aspect. Survey for threatened frog species should be undertaken in accordance with the Survey Guidelines for Australia’s Threatened Frogs and the EPBC Act Draft Referral Guidelines for the Wallum Sedge Frog (<i>Litoria olongburensis</i>). Due to the proximity of Grey-headed flying fox (<i>Pteropus poliocephalus</i>) roost sites to the rail line at Palmwoods, survey of these sites should be undertaken once the design and construction footprint is confirmed. The EPBC Act Referral should also comprehensively address the EPBC Act Referral Guidelines for the Vulnerable Koala, in recognition of the findings of suitable habitat within the Project	Timeframes EPBC Act Referral: allow 8 weeks for preparation, notification of 20 business days. If determined a controlled action, assessment can take from 6-18 months, depending on the assessment pathway nominated by DEE. Costs Lodgement of an EPBC Act Referral is \$6,577. Assessment fees are subject complexity of assessment, with base costs starting at \$8,010 and EIS at \$25,583. Post

LEGISLATIVE REQUIREMENT/ TRIGGER	REGULATORY AUTHORITY	RECOMMENDED MITIGATION MEASURE/ STRATEGY	INDICATIVE TIMEFRAMES AND COSTS
		<p>Area, but no evidence of koala presence.</p> <p>If the B2N Project is deemed to be a controlled action by DoEE, prepare any subsequent documentation that may be requested by DoEE. This may include the preparation of offset management plans in accordance with the EPBC Act and Offset Policy.</p> <p>Undertake public notification at the required milestones throughout the assessment phase, if deemed a controlled action.</p> <p>Ongoing consultation with DEE throughout the EPBC Act assessment process, if determined to be a controlled action.</p> <p>Prepare Technical Specifications as part of contract documentation, to inform the development of the Contractor's Environmental Management Plan (Construction) (EMP(C)). These would be in accordance with the TMR Technical Specification series, particularly MRTS51.1 Environmental Management Annexure and MRTS52.1 Erosion and Sediment Control Annexure.</p> <p>Detailed Design Contractor Responsibilities</p> <p>Design the B2N Project to minimise impact to MNES and incorporate mitigation where impacts are unavoidable.</p> <p>Additional survey work to inform EPBC Assessment processes, as directed by TMR.</p> <p>Assist in the identification of offset management plans.</p> <p>Assist in preparation of documentation as requested by TMR.</p> <p>Construction Contractor Responsibilities</p> <p>The Contractor will prepare an EMP(C) for approval by the Contract Administrator prior to construction commencing and shall identify the likely impacts, procedures and mitigation measures to be implemented which includes the management measures identified in the EPBC Act approval (if applicable). If the proposed action is determined to be a controlled action, this shall address all conditions imposed by DoEE relevant to the Construction Contractor's involvement in the works.</p>	<p>approval management plan assessment base cost is set at \$2,690, and can vary.</p> <p>Consultant/specialist advisor costs.</p>

LEGISLATIVE REQUIREMENT/ TRIGGER	REGULATORY AUTHORITY	RECOMMENDED MITIGATION MEASURE/ STRATEGY	INDICATIVE TIMEFRAMES AND COSTS
State Approvals			
<i>Aboriginal Cultural Heritage Act 2003</i>			
Cultural Heritage Management Plan (CHMP) or Aboriginal party agreement	Department of Aboriginal and Torres Strait Islander Partnerships (Qld) (DATSIP)	<p>TMR/QR Responsibilities</p> <p>The Cultural Heritage Risk Assessment prepared by Niche Environment and Heritage during the preparation of the REF recommends a cultural heritage survey to comply with the Aboriginal Cultural Heritage Act Duty of Care Guidelines.</p> <p>TMR to consult with relevant Aboriginal party (Kabi Kabi First Nation Registered Native Title Claimant) in accordance with the Protocols for consultation and negotiation with Aboriginal people, 3rd Edition, Department of Aboriginal and Torres Strait Islander Policy and Development (DATISPD, 1999).</p> <p>TMR to conduct a site assessment / survey in consultation with the Aboriginal party (Kabi Kabi First Nation Registered Native Title Claimant) prior to ground disturbing activities e.g. clearing of vegetation, bulk earthworks etc.</p> <p>TMR to undertake notification, negotiation and approval processes for a CHMP/CHMA, if the decision is made to seek a CHMP/CHMA, or otherwise undertake the negotiation process for an Aboriginal party agreement.</p> <p>TMR to comply with requirements and management measures outlined in the Approved CHMP/CHMA or Aboriginal party agreement once completed.</p> <p>TMR to advise the Designer of any particular constraints requiring management during design and construction.</p> <p>Kabi Kabi First Nation Registered Native Title Claimant Responsibilities</p> <p>Kabi Kabi First Nation to review, negotiate and sign the CHMP/CHMA or Aboriginal party agreement.</p> <p>Kabi Kabi First Nation Cultural Awareness Induction undertaken by a representative of the Kabi Kabi First Nation Registered Native</p>	<p>Timeframes</p> <p>To be completed prior to Construction</p> <p>Costs</p> <p>No application fees.</p> <p>Consultant/specialist advisor costs.</p>

LEGISLATIVE REQUIREMENT/ TRIGGER	REGULATORY AUTHORITY	RECOMMENDED MITIGATION MEASURE/ STRATEGY	INDICATIVE TIMEFRAMES AND COSTS
		<p>Title Claimant to the Contractor</p> <p>Detailed Design Contractor Responsibilities</p> <p>The Designer will take into account cultural heritage advice provided by TMR.</p> <p>The design will minimise impacts on indigenous cultural heritage.</p> <p>Construction Contractor Responsibilities</p> <p>The Contractor is to comply with the conditions of the Approved CHMP/CHMA or Aboriginal party agreement as specified in the contract documentation prepared for the Project. Specifically, this requirement will be included in Construction Contract documentation.</p> <p>The Contractor must prepare an EMP(C) for approval by the Contract Administrator prior to construction commencing and shall identify the likely impacts, procedures and mitigation measures to be implemented in accordance the B2N Project Specific CHMP/CHMA.</p>	
<i>Environmental Offsets Act 2014</i>			
<p>Environmental Offsets for prescribed activities having a significant residual impact on a prescribed environmental value</p> <p>Schedule 1 of the <i>Environmental Offset Regulation 2014</i> prescribes a number of activities for which offsets may be required if that activity will have a significant residual impact on a prescribed environmental value.</p> <p>Activity categories assessed as potentially relevant to this Project include:</p> <p>(2) A prescribed ERA under the <i>Environmental Protection Act 1994</i></p> <p>(5) Taking a protected plant within the meaning of the <i>Nature Conservation Act 1992</i> under a protected plant clearing permit in an area outside a protected area</p> <p>(7) Development under any of the following modules of the</p>	Department of Environment and Science (DES)	<p>TMR/QR Responsibilities</p> <p>The B2N Project traverses areas mapped within the high risk trigger area for protected flora and the South East Queensland Koala Protection Area (SEQKPA). Offsets may be required, depending on the outcome of the:</p> <ul style="list-style-type: none"> Protected plants survey, where a prescribed activity will have a significant residual impact on any protected plants identified in the survey. Refer to the requirements for protected flora survey under the <i>Nature Conservation Act 1994</i>. Surveys of any area mapped as SEQKPA, including number of non-juvenile koala habitat trees (NJKHTs). <p>Schedule 10 of the <i>Planning Regulation 2017</i> will not apply for koala (as the works are not assessable under a planning scheme;</p>	<p>Timeframes</p> <p>Flora survey report: At least one week before the commencement of clearing, and no later than 12 months after the completion of the flora survey. Offsets as instructed.</p> <p>Koala survey report: To be completed during detailed design. Offsets as</p>

LEGISLATIVE REQUIREMENT/ TRIGGER	REGULATORY AUTHORITY	RECOMMENDED MITIGATION MEASURE/ STRATEGY	INDICATIVE TIMEFRAMES AND COSTS
<p>State development assessment provisions</p> <p>(g) State code 22 Environmentally Relevant Activities</p> <p>(note- all other modules listed in the regulation were assessed as not applicable to this Project).</p>		<p>however, the B2N Project is not exempt from the requirement for offsets for koala habitat under the TMR DERM (now DES) Memorandum of Agreement (MOA) June 2010, SEQIPP, as it was not identified as a committed project at the time the MOA was signed by the last party.</p> <p>It is understood that no Environmentally Relevant Activities (ERAs) are currently proposed as part of the B2N Project. Should this change as a result of construction methodology, consideration of offsets as part of the ERA process would need to be taken into account.</p> <p>Detailed Design Contractor Responsibilities</p> <p>A flora survey is recommended, to be carried out by a suitably qualified person during the detailed design phase. Refer below (under <i>Nature Conservation Act 1994</i>).</p> <p>A koala habitat survey is recommended in areas mapped as SEQKPA, to be carried out by a suitably qualified person during the detailed design phase.</p> <p>Minimise activities that may require clearing and offsets, where possible.</p> <p>Specify additional management measures in contract documentation to minimise adverse impacts during construction.</p> <p>Construction Contractor Responsibilities</p> <p>Comply with any the permits and guidance developed during the detailed design phase, including limits to clearing.</p>	<p>instructed.</p> <p>Costs</p> <p>Consultant/ ecologist fees.</p> <p>Offset fees, if applicable</p>
<i>Environmental Protection Act 1994</i>			
<p>General Environmental Duty</p> <p>All persons have a general environmental duty to not carry out any activity that causes or is likely to cause environmental harm unless the person takes all reasonable and practicable measures to prevent or minimise harm.</p>	DES	<p>TMR/QR Responsibilities</p> <p>Prepare Technical Specifications as part of contract documentation, to inform the development of the Contractor's Environmental Management Plan (Construction) (EMP(C)). These would be in accordance with the TMR Technical Specification series, particularly MRTS51.1 Environmental Management</p>	<p>Timeframes</p> <p>Ongoing throughout design, construction and operation</p>

LEGISLATIVE REQUIREMENT/ TRIGGER	REGULATORY AUTHORITY	RECOMMENDED MITIGATION MEASURE/ STRATEGY	INDICATIVE TIMEFRAMES AND COSTS
<p>Environmental harm and environmental nuisance</p> <p>Under the <i>Environmental Protection Act 1994</i> it is an offence to cause environmental nuisance that is not authorised.</p> <p>Exemptions in Schedule 1 of the EP Act for environmental nuisance relevantly include "an act done or omission made under an approved compliance management plan under the <i>Transport Infrastructure Act 1994</i>, section 477G" (s3(j)).</p> <p>It is an offence to wilfully and unlawfully cause serious environmental harm.</p> <p>It is an offence to release, or cause to be released, a 'prescribed contaminant' into the environment. Prescribed contaminants are contaminants prescribed in an environmental protection policy or regulation.</p>	DES	<p>Annexure and MRTS52.1 Erosion and Sediment Control Annexure.</p> <p>TMR/QR Responsibilities</p> <p>Determine the requirements for Compliance Management Plans during the construction (and operation) phase in accordance with the <i>Transport Infrastructure Act 1994</i>. Specify additional management measures in Contract Documentation to minimise environmental nuisance and environmental harm during construction. This may or may not be complemented by Compliance Management Plans.</p> <p>Detailed Design Contractor Responsibilities</p> <p>The Designer is to be aware of requirements under the <i>Environmental Protection Act 1994</i> relating to nuisance caused by noise, lighting and dust, particularly in areas of the B2N Project in close proximity to residences and commercial enterprises.</p> <p>Potential environmental nuisance and harm in relation to sensitive areas is to be considered during the design process, including the rail design and regarding the location of ancillary sites, such as stockpiles, haul roads and loading areas, or areas where piling and rock breaking are planned.</p> <p>Construction Contractor Responsibilities</p> <p>The Contractor will prepare and implement an EMP(C) in accordance with the Contract Documentation. Siting of ancillary works and construction camp to be undertaken with regard to nearby sensitive receptors.</p>	<p>Timeframes</p> <p>To be developed during design and construction</p> <p>Costs</p> <p>No specific fees or permits identified.</p>
<p>Contaminated Land</p> <p>Various lots intersected by the B2N Project Area are listed on the Environmental Management Register.</p>	DES, Permit and Licence Management, Implementation Support Unit (PALM)	<p>TMR/QR Responsibilities</p> <p>A phase 1 contaminated land investigation is recommended to determine the nature of likely contaminants present, and the potential for transport of contaminants as a result of the B2N Project works. This would also require scoping of any subsequent on-site investigations recommended to determine the level of risk associated with potential risk areas that are identified. Targeted testing is required to identify potential impacts and develop</p>	<p>Timeframe</p> <p>Soil disposal permit: 10 business days</p> <p>Costs</p> <p>Soil disposal permit: no fee</p> <p>Disposal costs:</p>

LEGISLATIVE REQUIREMENT/ TRIGGER	REGULATORY AUTHORITY	RECOMMENDED MITIGATION MEASURE/ STRATEGY	INDICATIVE TIMEFRAMES AND COSTS
		<p>appropriate recommendations for reuse within the rail corridor or the need for a soil disposal permit. Should TMR wish to remove a site from the EMR this should be done in accordance with the 'Guideline – Listing and removing land on the land registers ESR/2016/2044'. Investigation reports and management plans must be certified by an auditor.</p> <p>Specify management measures to be conducted by the Contractor in the Contract Documentation.</p> <p>Detailed Design Contractor Responsibilities</p> <p>Conduct further investigations as directed by TMR.</p> <p>Design to minimise the extent of disturbance of material in the existing rail corridor and on EMR listed lots.</p> <p>Construction Contractor Responsibilities</p> <p>The Contractor to comply with the requirements for handling and reuse as specified in the contract documentation prepared for the B2N Project. If the contractor proposes to dispose of material offsite, a soil disposal permit will be required under s739 of the <i>Environmental Protection Act 1994</i> and further advice from DES required (note that on-site remediation is considered best practice and is the preferred management option where practicable). Removal of material from the existing rail corridor (listed on the EMR) is also likely to require soil disposal permit.</p>	<p>Subject to the nature of the contaminants identified (if any).</p> <p>Consultant/specialist advisor costs.</p>
<i>Environmental Protection Regulation 2019</i>			
<p>On-site Wastewater Treatment and Disposal</p> <p>Part 13 – Water Treatment Services, 63 Sewage Treatment</p> <p>If on-site wastewater treatment and disposal is required, an environmental authority for sewage treatment (i.e. an ERA) may be necessary. Consideration of Council building and plumbing approvals may also be required, as well as potential offsets requirements under the <i>Environmental Offsets Act 2014</i>.</p> <p>Other ERAs may be required, depending on the contractor's</p>	DES	<p>TMR/QR Responsibilities</p> <p>Identify any ERAs that may be conducted during construction in Contract Documentation.</p> <p>Construction Contractor Responsibilities</p> <p>The Contractor is to apply for an Environmental Authority if conducting any prescribed ERAs. It is not possible at this stage to determine whether a construction camp will be established, and if</p>	<p>Timeframe</p> <p>1-3 months</p> <p>Status</p> <p>To be determined subject to Contractor's methods</p> <p>Costs</p> <p>Application fee from</p>

LEGISLATIVE REQUIREMENT/ TRIGGER	REGULATORY AUTHORITY	RECOMMENDED MITIGATION MEASURE/ STRATEGY	INDICATIVE TIMEFRAMES AND COSTS
construction methodology.		so whether ERA will be triggered as a result.	\$1,247.19 subject to sizing, plus annual fee
<i>Planning Regulation 2017 (Planning Regulation) and Fisheries Act 1994</i>			
<p>Development Permit for Operational Works – Waterway Barrier Works</p> <p>The B2N Project Area traverses a number of high (red), medium (amber), and low (green) risk waterways mapped in the Department of Agriculture and Fisheries (DAF) “Queensland waterways for waterway barrier works” spatial layer. Where works cannot be conducted under the ‘Accepted development requirements for operational work that is constructing or raising waterway barrier works’, a development permit for ‘Operational work that is constructing or raising waterway barrier works’ will be required.</p>	Department of Agriculture and Fisheries (DAF)	<p>A Development Permit for ‘Operational work that is constructing or raising waterway barrier works’ is to be obtained for any waterway barrier works that will not comply with the Accepted Development Requirements (ADR). This may include culverts, culvert extensions and bridges where waterway barriers are constructed.</p> <p>TMR/QR Responsibilities</p> <p>TMR to prepare documentation, liaise with DAF and assessment officer and submit applications where required, unless it is decided that the Contractor will be responsible for securing waterway barrier works approval(s).</p> <p>Detailed Design Contractor Responsibilities</p> <p>Waterway barrier works must be designed to provide fish passage as required.</p> <p>Design shall consider rehabilitation of waterway, diversions, maintenance of grade profile and velocity, staging of works and timeframes to minimise impact during construction.</p> <p>Design details to be documented in a format that supports development applications outlined above or accepted development notifications to be prepared by the Contractor.</p> <p>Construction Contractor Responsibilities</p> <p>If secured by TMR, the Contractor to comply with any conditions of approval of the development permits obtained for ‘Operational work that is constructing or raising waterway barrier works’, as specified in the contract. This includes timeframes, construction methodology and rehabilitation; otherwise- the Contractor will be responsible for preparing documentation, liaising with DAF and assessment officer and submit applications where required,</p>	<p>Timeframe</p> <p>3 months, once detailed design is finalised</p> <p>Cost</p> <p>From \$3,313 to \$13,248 depending on the type and number of barrier works</p> <p>Consultant/specialist advisor/ design costs.</p>

LEGISLATIVE REQUIREMENT/ TRIGGER	REGULATORY AUTHORITY	RECOMMENDED MITIGATION MEASURE/ STRATEGY	INDICATIVE TIMEFRAMES AND COSTS
		The Contractor shall minimise impacts to waterways and duration of waterway disturbance.	
<p>Accepted development requirements for operational work that is constructing or raising waterway barrier works (DAF 2018)</p> <p>For culverts that comply with the accepted development requirements</p>	DAF	<p>TMR/QR Responsibilities</p> <p>TMR to provide certified drawings providing sufficient detail as part of the contract documentation to the contractor to enable completion of the pre-works notification form item 3: the proposed works comply with the self-assessable code WWBW01 (Part 3).</p> <p>Detailed Design Contractor Responsibilities</p> <p>Culverts are to be designed in accordance with the self-assessable code. The Designer is to identify which culverts cannot be designed in accordance with the code as this may trigger the requirement for a Development Permit.</p> <p>Construction Contractor Responsibilities</p> <p>The Contractor is to comply with the conditions of the 'Accepted development requirements for operational work that is constructing or raising waterway barrier works' as specified in the contract documentation prepared for the B2N Project. This includes pre-works and post-works notification in accordance with the accepted development requirements.</p> <p>The Contractor shall minimise impacts to waterway and duration of waterway disturbance.</p>	<p>Timeframe</p> <p>Refer to the accepted development requirements for pre-works and post-works notification requirements</p> <p>Cost</p> <p>No lodgement fee</p> <p>Consultant/specialist advisor/ design costs</p>
<p>Accepted development requirements for operational work that is constructing or raising waterway barrier works (DAF 2018)</p> <p>The location of temporary waterway barrier works necessary to facilitate construction will be determined by the Contractor.</p> <p>Temporary waterway barrier works associated with works requiring a Development Permit ('Operational work that is constructing or raising waterway barrier works') will be</p>	DAF	<p>TMR/QR Responsibilities</p> <p>TMR to ensure works are constructed in accordance with the relevant self-assessable codes or permits.</p> <p>Prepare contract documentation, including requirements for consideration of the temporary waterway barrier works self-assessable code.</p>	<p>Timeframe</p> <p>Refer to the accepted development requirements for pre-works and post-works notification requirements</p>

LEGISLATIVE REQUIREMENT/ TRIGGER	REGULATORY AUTHORITY	RECOMMENDED MITIGATION MEASURE/ STRATEGY	INDICATIVE TIMEFRAMES AND COSTS
identified in the relevant operational works application.		<p>Detailed Design Contractor Responsibilities</p> <p>Design the permanent works with consideration of the likely construction methodology and temporary waterway barrier works requirements.</p> <p>Construction Contractor Responsibilities</p> <p>The Contractor is to comply with the 'Accepted development requirements for operational work that is constructing or raising waterway barrier works' as specified in the contract documentation prepared for the project.</p> <p>The Contractor shall minimise impacts to waterway and duration of waterway disturbance.</p>	<p>Cost</p> <p>No lodgement fee</p> <p>Consultant/specialist advisor/ design costs</p>
<p>Accepted development requirements for operational work that is constructing or raising waterway barrier works (DAF 2018)</p> <p>The requirements for and location of bed level crossings (if required to facilitate construction) will be determined by the Contractor. These may require permits if they do not comply with the accepted development requirements.</p>	DAF	<p>TMR/QR Responsibilities</p> <p>TMR to ensure works are constructed in accordance with the accepted development requirements or permits. Prepare contract documentation, including requirements for consideration of accepted development requirements.</p> <p>Detailed Design Contractor Responsibilities</p> <p>Design to minimise the requirement for temporary bed level crossings, with consideration of the likely construction methodology and temporary waterway barrier works requirements.</p> <p>Construction Contractor Responsibilities</p> <p>The Contractor to comply with the accepted development requirements as specified in the contract documentation prepared for the Project.</p>	<p>Timeframe</p> <p>Refer to the accepted development requirements for pre-works and post-works notification requirements</p> <p>Cost</p> <p>No lodgement fee</p> <p>Consultant/specialist advisor/ design costs</p>
<i>Forestry Act 1959</i>			
<p>State Forest Tenure Resumption and Revocation under Section 32AA of the <i>Forestry Act 1959</i></p> <p>This applies to:</p> <ul style="list-style-type: none"> State Forests (vegetation clearing) 	DES (Queensland Parks and Wildlife)	<p>Sections of the Beerburrum State Forest will need to be revoked under section 32AA of the <i>Forestry Act 1959</i>.</p> <p>TMR Responsibilities</p> <p>TMR to prepare Briefing Documentation to support a State forest</p>	<p>Timeframe</p> <p>Up to 12 months</p> <p>Costs</p>

LEGISLATIVE REQUIREMENT/ TRIGGER	REGULATORY AUTHORITY	RECOMMENDED MITIGATION MEASURE/ STRATEGY	INDICATIVE TIMEFRAMES AND COSTS
<ul style="list-style-type: none"> Sale and disposal of forest products and quarry material on State forests, timber reserves and on other lands <p>If any works require access to State Forest prior to completion of the revocation process, a Permit to Occupy under Section 56 of the <i>Forestry Act 1959</i> may be required.</p>	Service)	<p>revocation proposal comprising:</p> <ul style="list-style-type: none"> A sketch showing the area to be resumed Brief document describing the proposed works and land affected Outcomes of Native Title Assessments comprising issues and or determination of offset requirements to support the action (if required) <p>TMR to prepare and provide Technical Specifications in contract documentation.</p> <p>Detailed Design Contractor Responsibilities</p> <p>Assist TMR to prepare the proposal with plans, reports as requested.</p> <p>Construction Contractor Responsibilities</p> <p>The Contractor to comply with the conditions of Revocation Conditions of Approval once obtained.</p>	<p>No application fees</p> <p>Consultant/ design costs</p> <p>Compensation/ payment dependent on negotiation conditions.</p>
<i>Biosecurity Act 2014</i>			
<p>Invasive Species</p> <p>Category 3 restricted plants have been identified within the project Project Area.</p>	DAF	<p>No specified approvals or permits required, however as a landowner, TMR must comply with the General Biosecurity Obligation (GBO) under the <i>Biosecurity Act 2014</i>, and is responsible for the management of weeds within their property. In the case of the rail corridor, this responsibility is passed on to the lease holder (Queensland Rail).</p> <p>TMR/QR Responsibilities</p> <p>TMR to provide Technical Specifications to the Contractor for the management of weeds during construction.</p> <p>Detailed Design Contractor Responsibilities</p> <p>The Designer is to assist TMR with B2N Project documentation as requested.</p> <p>Construction Contractor Responsibilities</p> <p>The Contractor is to comply with the Conditions of Contract</p>	<p>Timeframe</p> <p>Not applicable</p> <p>Costs</p> <p>Not applicable</p>

LEGISLATIVE REQUIREMENT/ TRIGGER	REGULATORY AUTHORITY	RECOMMENDED MITIGATION MEASURE/ STRATEGY	INDICATIVE TIMEFRAMES AND COSTS
		<p>prepared for the B2N Project, and include weed management in their EMP(C).</p> <p>Compliance required by Contractor to prevent spread and introduction of declared pests. Weed surveys are to be undertaken prior to commencement of construction to act as a baseline against which to monitor compliance with the EMP(C).</p>	
<i>Native Title Act 1993 (Cth) and Native Title (Queensland) Act 1993</i>			
<p>Native Title Assessment(s)</p> <p>Native Title Notification</p> <p>The <i>Native Title Act 1993</i> (Cth) provides for the recognition and protection of Native Title, establishes ways in which future dealings affecting Native Title (called "future acts") may validly proceed. It also establishes a mechanism for determining Native Title claims and provides for the validation of "past acts" and "intermediate period acts".</p> <p>Native Title applies to any areas in respect of which Native Title has not been extinguished.</p> <p>The <i>Native Title Act 1993</i> provides for Native Title holders and Registered Native Title Claimants to enjoy certain procedural rights in connection with the validation of future acts.</p>	Department of Natural Resources, Mines and Energy (DNRME, Queensland)	<p>TMR Responsibilities</p> <p>A Native Title Assessment, to ascertain the extent to which Native Title may continue to exist in the B2N Project area, has been carried out as part of the Business Case Phase. This will require confirmation prior to land acquisition processes.</p> <p>Section 24KA of the <i>Native Title Act 1993</i> (Cth) provides for the validation of future acts that permit the construction, operation, use, maintenance and repair of a railway for the general public. Where s24KA applies, Native Title rights and interests would be suppressed for the life of the B2N Project, but would continue to exist and would not be extinguished. However, s24KA can only apply if the future act would not prevent Native Title holders from having reasonable access to the area of the railway other than during construction or for safety reasons. As this requirement is inconsistent with the right of exclusive possession that will be an incident of a perpetual lease, it is unlikely that s24KA will apply.</p> <p>In fact, given that the commencement of the perpetual lease will be wholly inconsistent with the continued existence and exercise of Native Title, the grant of the perpetual lease will require Native Title currently existing over the affected land to first be extinguished either by being voluntarily surrendered to the State, under a registered Indigenous land use agreement (ILUA) with the appropriate Native Title parties, or else compulsorily acquired by the State.</p> <p>TMR to ensure that the necessary processes are conducted to achieve compliance with the future act requirements of the <i>Native</i></p>	<p>Timeframe</p> <p>Native Title Notification 28 days.</p> <p>Costs</p> <p>No application fees.</p> <p>Costs may be associated with Native Title acquisition.</p>

LEGISLATIVE REQUIREMENT/ TRIGGER	REGULATORY AUTHORITY	RECOMMENDED MITIGATION MEASURE/ STRATEGY	INDICATIVE TIMEFRAMES AND COSTS
		<p><i>Title Act 1993.</i> The compulsory acquisition process must mirror the process for resuming fee simple estates and also include the additional steps listed in s24MD(6B) of the <i>Native Title Act 1993</i>.</p> <p>TMR to ensure that currency of Native Title Assessments is maintained.</p> <p>TMR to verify that construction works are permissible and provide written verification in Contract Documentation.</p> <p>TMR to address any Native Title issues relating to the State forest revocation.</p>	
<i>Nature Conservation Act 1992, Nature Conservation (Wildlife Management) Regulation 2006</i>			
<p>Species Management Program Required for tampering with breeding habitat for:</p> <ul style="list-style-type: none"> Species defined as ‘near threatened’, ‘vulnerable’, ‘endangered’ or ‘extinct in the wild’ Breeding places located in forest reserves or other areas protected under the <i>Nature Conservation Act 1992</i> (NCA) Breeding places (roosts) for flying-fox species, including the grey-headed flying fox Special least concern animals including and migratory bird species listed under selected international agreements Species classed as ‘colonial breeders’ Breeding Places for least concern species. 	DES	<p>Further assessments of the species identified in the REF are recommended to determine whether they will require a Species Management Program for tampering with breeding habitat.</p> <p>Assessments should be suitably designed to collect information on the potential impacts and determine specific management measures that will be required during pre-clearing and construction. This information will assist with deciding which species will need a Species Management Program.</p> <p>A low risk SMP species will be required where breeding habitat is identified for least concern species only. This excludes special least concern species and colonial breeders. TMR’s existing Species Management Program for Least Concern Species will likely apply to the works, but should be reviewed to ensure all aspects of the B2N Project are addressed.</p> <p>A high risk SMP will be required where breeding habitat for least concern colonial breeders, special least concern, extinct in the wild, endangered, vulnerable or near threatened species is identified.</p> <p>TMR/QR Responsibilities</p> <p>TMR to consult with DES to identify species requiring a Species Management Program in accordance with the NC Act and prepare</p>	<p>Timeframe</p> <p>No statutory timeframe – target for approval is 40 days</p> <p>Costs</p> <p>N/A</p> <p>Consultant/specialist advisor costs</p>

LEGISLATIVE REQUIREMENT/ TRIGGER	REGULATORY AUTHORITY	RECOMMENDED MITIGATION MEASURE/ STRATEGY	INDICATIVE TIMEFRAMES AND COSTS
		<p>accordingly.</p> <p>Incorporate all management measures, commitments and conditions from relevant approvals and management plans into Annexure MRTS51.1 Environmental Management.</p> <p>Detailed Design Contractor Responsibilities</p> <p>Design shall seek to minimise impacts on animal breeding places where possible.</p> <p>Construction Contractor Responsibilities</p> <p>The Contractor is to comply with SMP conditions and contract conditions in relation to tampering with breeding habitat.</p>	
<p><i>Nature Conservation Act 1992 – Clearing of protected plants, including least concern plants</i></p> <p>*Protected plants (as defined in the <i>Nature Conservation Act 1992</i>) – a plant prescribed under the NC Act as threatened, near threatened or least concern wildlife.</p>	DES	<p>A protected plant survey in accordance with the DES 'Flora Survey Guidelines – Protected Plants' will be required in the mapped high risk trigger areas, and should be undertaken for any other area of likely disturbance (i.e. within the construction footprint). A flora survey report and either a clearing permit (if protected flora is identified) or an exempt clearing notification (if protected flora is not identified) should then be prepared. The flora survey report must be submitted at least one week before clearing begins and cannot be submitted more than 12 months after completion of the flora survey. The clearing start date and end date must also be nominated in the application.</p> <p>TMR/QR Responsibilities</p> <p>Engage suitably qualified practitioner to undertake a protected plants flora survey in accordance with the DES 'Flora Survey Guidelines – Protected Plants'.</p> <p>Produce a report that documents the findings of the survey and determine whether a permit to clear protected plants or exemption notification will be required.</p> <p>Submit report and application or exemption notification to DES.</p> <p>Include any conditions of clearing approval and/ or avoidance areas in contract documentation.</p>	<p>Timeframe</p> <p>Up to 40 business days</p> <p>Costs</p> <p>Consultant/specialist advisor costs</p>

LEGISLATIVE REQUIREMENT/ TRIGGER	REGULATORY AUTHORITY	RECOMMENDED MITIGATION MEASURE/ STRATEGY	INDICATIVE TIMEFRAMES AND COSTS
		Detailed Design Contractor Responsibilities Review the protected areas mapping during the design process and minimise clearing areas where practical. Construction Contractor Responsibilities Comply with the limit of clearing extents, minimise vegetation clearing as far as practical and comply with contract documentation.	
<i>Planning Regulation 2017 and Queensland Heritage Act 1992</i>			
Development on or adjoining a Queensland Heritage Place Places on the Queensland Heritage Register (QHR) include: <ul style="list-style-type: none"> • Public Air Raid Shelter, Landsborough Railway Station. • Landsborough Shire Council Chambers (Former). 	DES	Works in the vicinity of Landsborough Station will involve car parking upgrades on the east and west of the existing station. Car parking arrangements on the west will need to avoid impacting on the air raid shelter, both directly (spatially) and indirectly (e.g. through vibration associated with car park works). The works would also require acquisition of a portion of land situated within Lot 3/RP76609 (4 Maleny Street, Landsborough), which includes the former Landsborough Shire Council Chambers. As the grade separation works are located in proximity to the chambers, there is potential for visual and physical impacts, as well indirect impacts to the value. Based on the current design information, impacts to these State Heritage listed places are not anticipated, and consequently a development permit would not be required. Should changes to design result in impacts to the State listed heritage places, a permit would be required under Part 6, Division 1, s71 of the <i>Queensland Heritage Act 1992</i> . TMR/QR Responsibilities Ensure design development will not impact on the area included in the Landsborough Air Raid shelter listing Provide Technical Specifications to the Contractor Consult with the Queensland Heritage Council, QR and SCC during detailed design.	Timeframes N/A Costs N/A

LEGISLATIVE REQUIREMENT/ TRIGGER	REGULATORY AUTHORITY	RECOMMENDED MITIGATION MEASURE/ STRATEGY	INDICATIVE TIMEFRAMES AND COSTS
		<p>Detailed Design Contractor Responsibilities</p> <p>The Designer is to develop the design to avoid impacts on the Landsborough Air Raid Shelter and former Shire Council Chambers, and areas associated with the QHR Listing.</p> <p>Construction Contractor Responsibilities</p> <p>The Contractor to comply with the Conditions of Contract prepared for the Project.</p>	
<i>Planning Act 2016 and Planning Regulation 2017</i>			
Building work carried out by or on behalf of the State, a public sector entity or a local government	NA	Building work for station sites is self-assessable, if undertaken by or on behalf of the State or a public sector entity (<i>Planning Regulation 2017</i> , Schedule 7, Part 1 s2).	<p>Timeframes</p> <p>N/A</p> <p>Costs</p> <p>N/A</p>
<i>Planning Act 2016, Koala Habitat Area</i>			
State Government Supported Community Infrastructure Koala Conservation Policy (July 2017) for clearing of areas within the South East Queensland Koala Protection Area (SEQKPA)	DES	<p>TMR/QR Responsibilities</p> <p>The B2N Project is within the South East Queensland Koala Protection Area (SEQKPA), and is under the provisions of the TMR DERM (now DES) MOA June 2010, SEQIPP. Self-assessment is to be undertaken in accordance with TMR Compliance reporting requirements. This involves surveys of any area mapped as SEQKPA, including number of non-juvenile koala habitat trees (NJKHTs).</p> <p>No external approval required, however documentation of findings would need to be included in annual reporting by TMR. A survey of NJKHTs will be required.</p> <p>Refer to <i>Environmental Offsets Act 2014</i> section above for potential offset requirements.</p> <p>Detailed Design Contractor Responsibilities</p> <p>A koala habitat survey is recommended in areas mapped as SEQKPA, to be carried out by a suitably qualified person during the</p>	<p>Timeframes</p> <p>Prior to construction</p> <p>Costs</p> <p>N/A</p>

LEGISLATIVE REQUIREMENT/ TRIGGER	REGULATORY AUTHORITY	RECOMMENDED MITIGATION MEASURE/ STRATEGY	INDICATIVE TIMEFRAMES AND COSTS
		<p>detailed design phase.</p> <p>Minimise activities that may require clearing and offsets, where possible.</p> <p>Specify additional management measures in contract documentation to minimise adverse impacts during construction.</p> <p>Construction Contractor Responsibilities</p> <p>Comply with any the permits and guidance developed during the detailed design phase, including limits to clearing.</p>	
<i>Planning Regulation 2017 and Acquisition of Land Act 1967</i>			
<p>Reconfiguring a Lot</p> <p>Reconfiguration of a lot for s240 (Sublease of land to railway managers) of the <i>Transport Infrastructure Act 1994</i> is not assessable under the planning scheme development under Schedule 6, Part 4 s(2)(j) <i>Planning Regulation 2017</i> as is reconfiguration associated with acquisition under <i>Acquisition of Land Act 1967</i>.</p>	DNRME	<p>TMR/QR Responsibilities</p> <p>TMR Property Services to progress resumption and reconfiguration of a properties, including some properties listed on the EMR, where a land requirement has been identified for rail corridor or road realignment purposes.</p> <p>TMR to provide Technical Specifications to the Contractor, including any requirements for soil disposal permits, resulting from investigations undertaken to comply with the requirements of the EP Act.</p> <p>Detailed Design Contractor Responsibilities</p> <p>Review the previous investigations and confirm requirements for contaminated land investigations, suitability of material for reuse etc.</p> <p>Construction Contractor Responsibilities</p> <p>The Contractor to comply with the requirements for handling and reuse as specified in the contract documentation prepared for the Project.</p>	<p>Timeframes</p> <p>N/A</p> <p>Costs</p> <p>N/A</p>
<i>Transport Infrastructure Act 1994</i>			
Approved Compliance Management Plan/s	TMR	TMR/QR Responsibilities, Detailed Design / Construction Contractor Responsibilities	Timeframes N/A

LEGISLATIVE REQUIREMENT/ TRIGGER	REGULATORY AUTHORITY	RECOMMENDED MITIGATION MEASURE/ STRATEGY	INDICATIVE TIMEFRAMES AND COSTS
		May be prepared and approved by TMR or prepared by contractor and approved by TMR. Compliance management plans establish how construction and maintenance of infrastructure will comply with relevant legislative requirements.	Costs Consultants costs to prepare
<i>Transport Infrastructure Act 1994 and Transport Infrastructure (State-Controlled Roads) Regulation 2006</i>			
Road Corridor Permit	TMR	TMR/QR Responsibilities Activities or works within State Controlled road corridor. Consultation with TMR (North Coast) Detailed Design / Construction Contractor Responsibilities Completion of Road Corridor Permit Application, including traffic management plans	Timeframes Prior to commencement of construction Costs N/A
<i>Local Government Act 2009 and Local Laws 1 & 4 (Roads) and Subordinate Local Law 1 & 4 (Interference with Local Government Roads)</i>			
Road and Footpath Permit	SCC	This will apply for any temporary or permanent works within a local government road or footpath TMR/QR Responsibilities Consultation with Sunshine Coast Council officers Detailed Design / Construction Contractor Responsibilities Completion of Road and Footpath Permit, including traffic management plans.	Timeframes Prior to commencement of construction Costs N/A
<i>Land Act 1994</i>			
Temporary road closures to facilitate works Permanent road closures for sections of road reserve impacted by the works	DNRME	Temporary road closures may be required to facilitate construction or construction access. In some cases, unformed road reserves will be required to facilitate construction and operation of the corridor. These areas may be leased to adjacent landowners. Detailed Design / Construction Contractor Responsibilities Consultation with DNRME.	Timeframes Prior to commencement of construction Costs N/A

LEGISLATIVE REQUIREMENT/ TRIGGER	REGULATORY AUTHORITY	RECOMMENDED MITIGATION MEASURE/ STRATEGY	INDICATIVE TIMEFRAMES AND COSTS
		Application for road closure. Preparation of traffic management plans.	
Road opening / application to dedicate State Land as a road	DNRME	Road openings will be required where realigned sections of State and local roads are required to facilitate the B2N Project.	Timeframes Prior to commencement of construction Costs N/A
<i>Vegetation Management Act 1999, Planning Regulation 2017</i>			
Exempt Clearing Work Under Schedule 21 of the <i>Planning Regulation 2017</i> , the following is not assessable development under Part 1, s1: (14)(b) Clearing vegetation for the construction or maintenance of infrastructure stated in Schedule 5, if the infrastructure is government supported transport infrastructure." Transport infrastructure in Schedule 5 includes rail transport infrastructure, State-controlled roads, storage and works depots and similar facilities relating to the provision or maintenance of transport infrastructure, any other facility for transport that is intended primarily to accommodate government functions. Schedule 21 also lists activities including geotechnical survey and cadastral survey as exempt subject to defined clearing limits.	DNRME	TMR/QR Responsibilities TMR to provide Technical Specifications to the Contractor Detailed Design Contractor Responsibilities The Designer is to incorporate all management measures and Contractor's responsibilities into the MRTS51.1 Environmental Management Annexure Construction Contractor Responsibilities The Contractor to comply with the defined clearing limits in the contract documentation.	Timeframes N/A Costs N/A
<i>Water Act 2000 and Water Regulation 2000</i>			
A water licence to interfere with the course of flow under the Water Act may be required , if diversion works are required at any of the watercourses recognised under the Water Act. Other watercourses traversed by the Project Area, but classified as 'yet to be determined' may also be recognised as watercourses under the Water Act.	DNRME	TMR/QR Responsibilities Aim to minimise the need for watercourse diversions. Consult with DNRME regarding any 'yet to be determined' watercourses. Consult with DNRME to determine expectations and timeframes	Timeframe 6 to 8 months Costs \$133.20 Consultant/specialist

LEGISLATIVE REQUIREMENT/ TRIGGER	REGULATORY AUTHORITY	RECOMMENDED MITIGATION MEASURE/ STRATEGY	INDICATIVE TIMEFRAMES AND COSTS
A separate development permit would not be required in accordance with Schedule 7, Part 3, section 5(1)(d) of the <i>Planning Regulation 2017</i> (works are accepted development if the interfering is authorised under a water licence and the work complies with the conditions of the licence).		<p>for application and assessment.</p> <p>TMR to provide Technical Specifications as part of contract documentation regarding conditions of approval (if applicable).</p> <p>TMR to provide a conceptual set of overarching erosion and sediment control principles to be used by the Contractor to guide the development of the Contractor's erosion and sediment control plans for the B2N Project.</p> <p>Detailed Design Contractor Responsibilities</p> <p>The Designer is to assist TMR with applications, including design of the diversions, minimising alterations to waterway profile and velocity, revegetation design and construction staging.</p> <p>Construction Contractor Responsibilities</p> <p>The Contractor to comply with the conditions of Water Licence for diverting a watercourse or diverting the course of flow, where specified in the contract documentation prepared for the B2N Project.</p>	advisor/ design costs
<p>Exemption requirements for constructing authorities for the take of water without a water entitlement, WSS/2013/666, Version 3.05, 2019.</p> <p>Taking of water for construction purposes e.g. dust suppression, mixing of pavement materials etc.</p> <p>This exemption does not exempt the user from obtaining any other authority that may be required before commencing the take of water (e.g. owner's consent, vegetation clearing permits, development approvals).</p> <p>If the proposed take of water will not meet the requirements outlined in the Protocol, a water authority granted under the <i>Water Act 2000 (Water Act)</i> must be obtained before any water is taken.</p>	DNRME	<p>TMR is classified as a constructing authority under the Water Regulation and the exemption requirements apply.</p> <p>Contractors, subcontractors and other agents engaged by the constructing authority may also use the exemption requirements. The exemptions that are outlined under <i>WSS/2013/666, Version 3.05, 2019</i> and may only be used by a constructing authority (e.g. TMR):</p> <ul style="list-style-type: none"> defined under schedule 2 of the <i>Acquisition of Land Act 1967</i>, including state government departments and local governments for the take of water in accordance with sections 23 and 24 of the <i>Water Regulation 2016</i> without the need for a water authority for the purpose of constructing or maintaining infrastructure that the constructing authority may lawfully construct or maintain in accordance with all requirements in that document. 	<p>Timeframes</p> <p>N/A</p> <p>Costs</p> <p>N/A</p>

LEGISLATIVE REQUIREMENT/ TRIGGER	REGULATORY AUTHORITY	RECOMMENDED MITIGATION MEASURE/ STRATEGY	INDICATIVE TIMEFRAMES AND COSTS
		<p>If water supply cannot be sourced in accordance with the exemption, a permit to take water may be required.</p> <p>TMR/QR Responsibilities</p> <p>TMR to provide Technical Specifications in contract documentation.</p> <p>Construction Contractor Responsibilities</p> <p>The Contractor to comply with the conditions of the “Exemption requirements for constructing authorities for the take of water without a water entitlement, <i>WSS/2013/666, Version 3.05, 2019</i>” as specified in the contract documentation prepared for the B2N Project.</p> <p>In addition to notifying the Administrator and TMR, the Chief Executive of DNRME must be notified in writing, 10 business days, (or a shorter period approved by the Chief Executive) before taking any water under section 20C(3) of the <i>Water Act 2000</i>.</p> <p>The contractor is to prepare a dewatering plan for taking water from farm dams.</p> <p>If construction water supply cannot be sourced in accordance with the exemption, the contractor will obtain a water licence.</p>	
<p><i>Riverine Protection Permit exemption requirements WSS/2013/726 (2018)</i></p> <p>For excavation or placement of fill in a watercourse, lake or spring, or destruction of vegetation in a watercourse, lake or spring</p>	DNRME	<p>TMR is an approved entity in accordance with Schedule 2 of the guideline.</p> <p>Detailed Design Responsibilities</p> <p>Determine compliance with vegetation clearing requirements in guideline.</p> <p>Detailed Design / Construction Contractor Responsibilities</p> <p>Comply with minimum requirements set out in the guideline to ensure impacts on water quality, water flow and the physical integrity of a watercourse, lake or spring are reduced.</p>	<p>Timeframes</p> <p>N/A</p> <p>Costs</p> <p>N/A</p>

3 Planning and Design

Table 3 provides recommendations to be considered during the design process to ensure environmental impacts associated with the location, design and / operation of the rail are minimised. Outcomes will be reviewed in the Environmental Design Report.

Table 3: Design Recommendations for the B2N Project

CONSTRAINT/ OPPORTUNITY	RISK LIKELIHOOD	RISK CONSEQUENCE	RECOMMENDATION/S	RESPONSIBILITY	RESIDUAL RISK
1. Climate					
1.1 Increased intensity in rainfall events leads to flooding, blockages of culverts and fauna crossings, and increased bridge and culvert maintenance requirements along the corridor.	Moderate	Possible	Undertake sensitivity testing to determine the impact of extreme weather events beyond that considered in Business Case design. Design drainage infrastructure and fauna crossing structures to account for an increase in rainfall events.	Detailed Design Contractor	Medium
			Incorporate requirements for severe weather management plan as per item 12 of this table.	TMR	Medium
1.2 Infrastructure resilience to extreme heat conditions and patron comfort	Moderate	Possible	Specification of construction materials should take into consideration durability with regard to heat stress, rainfall extremes and bushfire risk. Shading, landscaping, and patron and staff comfort at stations should also be considered in the context of future climatic trends.	Detailed Design Contractor	Medium
2. Air Quality					
2.1 Construction activities generate air quality impacts	Possible	Minor	Minimise construction footprint and area of disturbance during detailed design.	Detailed Design Contractor	Low

CONSTRAINT/ OPPORTUNITY	RISK LIKELIHOOD	RISK CONSEQUENCE	RECOMMENDATION/S	RESPONSIBILITY	RESIDUAL RISK
			Requirements for further air quality assessment are to be determined during detailed design.	TMR	Low
			<p>Requirements for air quality management are to be incorporated into B2N Project Contract Documentation including the following:</p> <ul style="list-style-type: none"> • Regular watering or temporary sealing of the site and access roads. • Avoiding works (e.g. stripping, excavation etc.) during dry and windy conditions. • Fitting equipment with dust collection / suppression devices. • Avoid undertaking works during dry and windy conditions (winds >10 m/s). • Dust suppression by regular water spraying. • Regular water spraying or covering of exposed surfaces. • Minimising areas of cleared or disturbed land. • Exposed areas to be re-vegetated as soon as practically possible. • Plant or equipment are not to be parked idling for extended periods of time. • Maintaining operation and exhaust systems of construction plant, vehicles and machinery in accordance with manufacturer's recommendations to minimise emissions to the atmosphere. 	TMR	Low

CONSTRAINT/ OPPORTUNITY	RISK LIKELIHOOD	RISK CONSEQUENCE	RECOMMENDATION/S	RESPONSIBILITY	RESIDUAL RISK
			<ul style="list-style-type: none"> Burning of cleared vegetation must not occur during the construction of the B2N Project. 		
2.2 Trains using corridor generate emissions, particularly whilst waiting for passing opportunities.	Likely	Minor	Refine operational modelling to optimise train passing opportunities.	TMR	Low
3. Surface Water					
<p>3.1 Water Quality – downstream and offsite impacts during operation</p> <p>Stormwater run-off or releases from land development during operation of infrastructure has a potential to cause water contamination resulting in environmental harm.</p> <p>Operation of the rail corridor shall not result in release of prescribed contaminants that cause environmental nuisance or harm.</p> <p>During the operational phase, treatment controls will be incorporated into the design to manage stormwater runoff.</p>	Likely	Moderate	<p>Conduct modelling of likely operational water quality of runoff from rail and realigned road corridors and determine the requirement for treatment train controls in accordance with the TMR Road Drainage Design Manual or other applicable guidance.</p> <p>This may include water sensitive urban design (WSUD) measures and spill containment devices.</p>	Detailed Design Contractor	Low
			<p>Include water quality treatment measures (including WSUD measures) and spill containment devices in response to outcomes of operational water quality modelling. Key considerations will include physical space within the corridor to accommodate treatment devices and ongoing level of maintenance to be accepted by the asset owner. This should also include consideration of any locations where additional scour protection may be</p>	Detailed Design Contractor	Minor

CONSTRAINT/ OPPORTUNITY	RISK LIKELIHOOD	RISK CONSEQUENCE	RECOMMENDATION/S	RESPONSIBILITY	RESIDUAL RISK
			required to minimise erosion risk and maintain watercourse stability.		
<p>3.2 Water Quality – downstream and offsite impacts during operation</p> <p>Dewatering is a common requirement of construction works (e.g. decommissioning of farm dams and disposal of water from coffer dams, sediment holding ponds, basins or trenches).</p> <p>Stormwater run-off or releases from land development and associated construction works has a high potential to cause water contamination resulting in environmental harm.</p> <p>Where run off water is contaminated with silt or other pollutants such as hydrocarbons, this water must not be pumped or allowed to flow directly or indirectly to surface waters or groundwater without treatment.</p> <p>It is an offence to unlawfully deposit a prescribed water contaminant to waters.</p>	Likely	Major	Establish and implement a pre-construction monitoring program for water quality including criteria/standard locations, frequency, reporting, and verification. This should be for 12 months, and will form the basis of water quality monitoring and reporting in future stages construction.	TMR	NA
			An erosion and sediment control plan should be developed by a Certified Professional in Erosion and Sediment Control (CPESC) during the detailed design phase, to identify risk areas and reasonable treatments for costing and contract administration purposes.	Detailed Design Contractor	Medium
<p>3.3 Dewatering of farm dams to be decommissioned</p> <p>Farm dams may provide habitat for a range of native and exotic fauna species. Dewatering of a farm dam may result in the spread of aquatic weeds, release of exotic fish to waterways, or death of native fauna species.</p>	Possible	Moderate	Develop requirements for a dewatering strategy, addressing both habitat requirements and water quality objectives for the B2N Project.	Detailed Design Contractor	Low
			Incorporate dewatering strategy requirements into the B2N Project Contract Documentation.	TMR	Low

CONSTRAINT/ OPPORTUNITY	RISK LIKELIHOOD	RISK CONSEQUENCE	RECOMMENDATION/S	RESPONSIBILITY	RESIDUAL RISK
<p>3.4 Taking of Water</p> <p>Water extraction for the purpose of dust suppression is a common requirement of construction works. Water is commonly extracted from various sources, e.g. natural watercourse or waterbody (farm dams), bores (by agreement) or potable water.</p> <p>Water sources may potentially contain unknown contaminants and must be used with caution to prevent harm to human health and or the environment.</p>	Likely	Moderate	Identify potential sources of construction water for the site. While generally a construction related issue, access to water may require additional clearing or species management requirements, which may require permits to be applied for during detailed design.	Detailed Design Contractor	Low
			<p>Specify in B2N Project Contract Documentation:</p> <ul style="list-style-type: none"> the Contractor must not extract water from the DAF mapped waterways during the course of the B2N Project. taking of water activities shall be conducted by the Contractor in accordance with “Exemption requirements for constructing authorities for the take of water without a water entitlement, WSS/2013/666, Version 3.05, 2019” unless otherwise specified by permit or authority. approval must be sought by the Contractor from the landowner, TMR, Local or State Government (e.g. DNRME) prior to taking of water for mixing pavement materials and dust suppression. the Contractor notify the Chief Executive (DNRME), in writing 10 business days before commencing the take of water. waters to be used for dust suppression purposes must be tested to avoid 	TMR	Low

CONSTRAINT/ OPPORTUNITY	RISK LIKELIHOOD	RISK CONSEQUENCE	RECOMMENDATION/S	RESPONSIBILITY	RESIDUAL RISK
			environmental or health impacts as a result of their use.		
			Provide sufficient information in the contract documentation (constraints and statutory requirements) to assist the contractor to determine requirements for the construction and operation of any temporary water storages.	Detailed Design Contractor	Low
3.5 All works in waterways Construction impacts associated with all works in waterways can include erosion and release of sediment-laden water resulting in smothering aquatic life, decline in water quality, aquatic life stress and potential death.	Likely	Major	Designer to consider the requirements to meet the water quality objectives for each waterway within the catchment.	Detailed Design Contractor	Low
			Specify in B2N Project Contract Documentation: <ul style="list-style-type: none"> the Contractor is to prepare an ESCP and submit to TMR for approval prior to the commencement of works in waterways. the Contractor is not to commence works in waterways during times of elevated flows. the Contractor to engage a Fauna Spotter / Catcher in accordance with a DES Protection Damage Mitigation Permit (DMP) (e.g. removal and relocation of wildlife) and Animal Ethics Permit for the relocation of aquatic fauna during works 	TMR	Low
3.6 Waterway crossings - culverts The <i>Fisheries Act 1994</i> applies where barriers to fish movement are constructed on waterways shown on the spatial data	Likely	Major	The Business Case design made initial recommendations for structure design at the various waterway crossings. In selection of appropriate waterway crossing structure designs, the value of	Detailed Design Contractor	Low

CONSTRAINT/ OPPORTUNITY	RISK LIKELIHOOD	RISK CONSEQUENCE	RECOMMENDATION/S	RESPONSIBILITY	RESIDUAL RISK
<p>layer Queensland Waterways for Waterway Barrier Works.</p> <p>The installation of incorrectly designed culverts can impact or impede fish passage.</p>			<p>the waterway for fish passage and as a terrestrial animal corridor should be considered.</p> <p>Where barriers to fish movement are constructed across waterways, including culverts, bed-level crossings and temporary barrier, approvals will be triggered. Most culvert structures will be able to be constructed under the conditions of the <i>Accepted development requirements for operational work that is constructing or raising waterway barrier works</i> (2018). Where works can comply with the accepted development requirements, no development approval is required. The code does not apply to culvert construction or extension on a major risk (purple) waterway.</p> <p>Requirements for all culverts or culvert extension works on all other DAF risk mapped waterways are to meet the accepted development requirements in sections 4 and 5.1, including (but not limited to):</p> <ul style="list-style-type: none"> • Works must not commence during times of elevated flows • Works are to be undertaken to the standard set out in the current version of the <i>Best Practice Erosion and Sediment Control</i>, published by the International Erosion Control Association, Australasia. • Waterway barriers are designed to provide adequate fish passage for the 		

CONSTRAINT/ OPPORTUNITY	RISK LIKELIHOOD	RISK CONSEQUENCE	RECOMMENDATION/S	RESPONSIBILITY	RESIDUAL RISK
			<p>site and fish passage is provided for the life of the barrier.</p> <p>Further specific design requirements vary for low risk (green), moderate risk (amber), high risk (red) and major risk (purple) streams.</p> <p>Where the design cannot comply with the Accepted Development Requirements (or there is good justification why the structure should not comply), a development approval is required. A single development approval may encompass multiple sites.</p> <p>Additional recommended design parameters for aquatic fauna are included within <i>Fauna Sensitive Road Design Volume 2: Preferred Practices</i> (TMR, 2010)</p>		
<p>3.7 Waterway crossings - bridges</p> <p>Bridges can also impact or impede fish passage.</p>	Possible	Moderate	<p>Generally, bridge design recommendations are as follows (as per the DAF 'What is not a waterway barrier' fact sheet):</p> <ul style="list-style-type: none"> • New single span bridges are not waterway barrier works when: <ul style="list-style-type: none"> — the abutments do not extend into the waterway beyond the high bank; — the bank revetment works do not extend beyond the toe of the bank; and — no scour protection is placed on the bed of the waterway 	Detailed Design Contractor	Low

CONSTRAINT/ OPPORTUNITY	RISK LIKELIHOOD	RISK CONSEQUENCE	RECOMMENDATION/S	RESPONSIBILITY	RESIDUAL RISK
			<p>upstream, downstream or under the structure.</p> <ul style="list-style-type: none"> • New multi-span bridges are not waterway barrier works when: <ul style="list-style-type: none"> — in all waterways, the abutments do not extend into the waterway beyond the high bank, and the abutment revetment works do not extend into the waterway beyond the toes of the banks; — in all waterways, bed scour protection is placed at, or below the natural bed level of the waterway, and does not change the characteristics of the low flow channel; — in Purple, Red, Amber and Green waterways, bed scour protection cannot extend more than 20m upstream, or 20m downstream beyond the footprint of the bridge. — in Grey waterways, bed scour protection cannot extend more than 5m upstream, or 5m downstream beyond the footprint of the bridge. — in Amber and Green waterways, the pier/pile and/or pier/pile platform are completely outside the low flow channel — in Purple, Red and Grey waterways, the pier/pile and/or 		

CONSTRAINT/ OPPORTUNITY	RISK LIKELIHOOD	RISK CONSEQUENCE	RECOMMENDATION/S	RESPONSIBILITY	RESIDUAL RISK
			<p>pier/pile platform can be within the low flow channel, but does not change the characteristics of the low flow channel (i.e. cause scouring of the low flow channel banks or bed).</p> <p>Permanent access or erosion control structures within the main channel adjacent to the bridge are set at or below bed level, roughened to approximately simulate natural bed conditions, and maintained so that there are no drops in elevation at their edges or joins with the stream bed.</p>		
<p>3.8 Watercourse Diversion / Water Licence</p> <p>Watercourse diversions may result in potential physical upstream and downstream system process impacts, which are addressed at the planning and design phase of the B2N Project.</p> <p>Construction impacts associated with watercourse diversions can include erosion and release of sediment-laden water resulting in smothering aquatic life, decline in water quality, stress to aquatic life and potential death.</p>	Possible	Major	Review bridge and culvert designs and develop design and construction methodology to avoid diverting creeks wherever possible.	Detailed Design Contractor	Low
			<p>Where this is not possible:</p> <ul style="list-style-type: none"> confirm with DNRME which waterways will require a water licence for diversion works ('Application by an Entity for a Licence to Interfere with the Course of Flow') minimise the extent of diversion work through design refinements prepare 'Application by an Entity for a Licence to Interfere with the Course of Flow' for conducting watercourse diversion works 	Detailed Design Contractor	High

CONSTRAINT/ OPPORTUNITY	RISK LIKELIHOOD	RISK CONSEQUENCE	RECOMMENDATION/S	RESPONSIBILITY	RESIDUAL RISK
			<ul style="list-style-type: none"> • conduct modelling to determine the extent of change to hydraulic conditions. • develop rehabilitation and maintenance plan for post-works rehabilitation and revegetation • consider ecological values to be protected during construction and operation. 		
<p>3.9 Watercourse Diversion / Culverts / Operational Works – Waterway Barrier Works</p> <p>Waterway barriers can impact on fish stocks by restricting the movement of fish species between critical fish habitats.</p> <p>Construction impacts associated with waterway barrier works can include erosion and release of sediment-laden water resulting in smothering aquatic life, decline in water quality, stress to aquatic life and potential death.</p>	Possible	Major	Review bridge and culvert designs and develop design and construction methodology to avoid diverting creeks wherever possible.	Detailed Design Contractor	Low
			<p>Where this is not possible:</p> <ul style="list-style-type: none"> • review environmental conditions at diversion and crossing locations, including local ecology and hydraulic conditions. • design scour protection measures in accordance with MRS03: Drainage, Retaining Structures and Protective Treatments (TMR, 2010), and ‘<i>Accepted development requirements for operational work that is constructing or raising waterway barrier works</i>’, 2018. • design appropriate controls, including temporary diversions, coffer dams or isolation barriers to minimise potential erosion impacts of in-stream works. • design realignment of waterways in order to maintain the natural bed slope and flow velocities to as close to 	Detailed Design Contractor	High

CONSTRAINT/ OPPORTUNITY	RISK LIKELIHOOD	RISK CONSEQUENCE	RECOMMENDATION/S	RESPONSIBILITY	RESIDUAL RISK
			<p>existing case as possible to reduce scour and maintain adequate conditions for fish passage. To achieve this, design measures may include widening the flow-path and/or introduction of rock in the creek bed.</p> <ul style="list-style-type: none"> • design realigned waterways in order to simulate the natural watercourses by including meanders, pools, riffles, shaded and open sections, deep and shallow sections and different types of substrata. Natural features such as rock outcrops and boulders are retained or recreated. • design to minimise disturbance of the bed and banks of waterways and drainage lines. • design temporary works where these are necessary to facilitate permanent works under a waterway barrier works development permit. • design to consider rehabilitation of native riparian vegetation along the banks of the creeks. • specify timeframes and construction methodology including staging for incorporation into application documentation. • prepare application for Operational Work – Waterway Barrier Works for conducting waterway barrier works for any culverts or waterway barrier works that do not comply with ' <i>Accepted development requirements for</i> 		

CONSTRAINT/ OPPORTUNITY	RISK LIKELIHOOD	RISK CONSEQUENCE	RECOMMENDATION/S	RESPONSIBILITY	RESIDUAL RISK
			<i>operational work that is constructing or raising waterway barrier works', 2018.</i>		
<p>3.10 Minor Waterway Barrier Works – Accepted development (<i>Accepted development requirements for operational work that is constructing or raising waterway barrier works, 2018</i>).</p> <p>Waterway barriers can impact on fish stocks by restricting the movement of fish species between critical fish habitats.</p> <p>Construction impacts associated with waterway barrier works can include erosion and release of sediment-laden water resulting in smothering aquatic life, decline in water quality, aquatic life stress and potential death.</p> <p>Temporary waterway barrier works associated with a permanent waterway barrier work will exist only for a temporary period and cause minimal and acceptable disruption to fish movement in the area, during the period of installation. The accepted development requirements allows temporary waterway barrier works to be in place at a given site for no more than 180 days for purple (major) and red (high) waterways, and 360 days for amber (moderate) and green (low) waterways.</p> <p>Fish movement is required past temporary waterway barrier works where the duration of the barrier is greater than that allowed for under the accepted</p>	Likely	Major	<p>Design waterway crossings to comply with the '<i>Accepted development requirements for operational work that is constructing or raising waterway barrier works', 2018.</i> Where this is not possible, refer above for requirements for a development permit for operational works (waterway barrier works).</p> <p>Prepare Design Drawings to comply with the accepted development notification requirements for the pre-works and post-works.</p>	Detailed Design Contractor	Medium
			Specify in B2N Project Contract Documentation that the Contractor must comply with the conditions of the relevant section of the ' <i>Accepted development requirements for operational work that is constructing or raising waterway barrier works', 2018</i> , otherwise approvals may be required. This should include the preparation of a compliance spreadsheet.	TMR	Medium

CONSTRAINT/ OPPORTUNITY	RISK LIKELIHOOD	RISK CONSEQUENCE	RECOMMENDATION/S	RESPONSIBILITY	RESIDUAL RISK
development requirements. Any temporary culverts that do not comply with these requirements will need to be approved. Design waterway crossings to comply with the <i>'Accepted development requirements for operational work that is constructing or raising waterway barrier works'</i> , 2018. Where this is not possible, refer above for requirements for a development permit for operational works (waterway barrier works).					
3.11 Monitoring Rainfall	Likely	Major	Specify in Project B2N Contract Documentation that the Contractor must monitor rainfall to ensure compliance with water quality monitoring requirements.	TMR	Low
4. Flooding					
<p>4.1 Working on flood prone land (e.g. flash, riverine inundation).</p> <p>Construction works can also potentially divert or compromise localised flood paths and levels.</p> <p>Potential impacts can include:</p> <ul style="list-style-type: none"> • flood levels, flood inundation periods, and the timing of floodwater rise and fall as well as some minor localised impacts can have an impact on construction works. • land modification and destabilisation resulting in diversion of localised flood paths and levels. 	Possible	Major	<p>Refine hydraulic modelling during subsequent design stages to assess more detailed information as it becomes available on alignments, topography, structures.</p> <p>Refine bridge designs including piers and superstructure, blockage considerations, acceptable afflux, freeboard assessment and further verification.</p> <p>Assess Scour protection requirements.</p> <p>Ensure fauna passage considerations are included.</p>	Detailed Design Contractor	Low

CONSTRAINT/ OPPORTUNITY	RISK LIKELIHOOD	RISK CONSEQUENCE	RECOMMENDATION/S	RESPONSIBILITY	RESIDUAL RISK
<ul style="list-style-type: none"> • potential for erosion and increased handling costs. • third party property and infrastructure impacts • work delays due to flooding resulting in increased traffic management costs, increase time and cost to complete the B2N Project. 					
5. Groundwater					
<p>5.1 Key construction risks to groundwater include:</p> <ul style="list-style-type: none"> • activities that cause a localised decrease in water level such as dewatering activities and earthworks, particularly at cuttings • activities which cause the spill or leaching of contaminants ultimately reducing the groundwater quality • direct impact on bores, or removing access to local users. 	Possible	Moderate	A risk based approach to the design and inclusion of water quality treatment devices will be required to determine the level of protection required. This will also need to consider the potential for incidents and spills during operation. Groundwater monitoring at cuttings may be required, if identified in the geotechnical investigations.	Detailed Design Contractor	Low
6. Soil and Land Management					
<p>6.1 Permanent erosion and sediment control – drainage and waterway structures</p> <p>Erosion at waterways and drainage structures can result in destabilisation of waterways and lead to impacts to aquatic fauna from sedimentation.</p>	Possible	Medium	<p>Designer to incorporate appropriate permanent erosion and sediment control in accordance with:</p> <ul style="list-style-type: none"> • Best Practice Erosion and Sediment Control Guidelines (IECA, 2008) • MRTS51 Environmental Management • MRTS52 Erosion and Sediment Control 	Designer	Low

CONSTRAINT/ OPPORTUNITY	RISK LIKELIHOOD	RISK CONSEQUENCE	RECOMMENDATION/S	RESPONSIBILITY	RESIDUAL RISK
			<ul style="list-style-type: none"> Chapter 7 Environmental Consideration and Design of the TMR Drainage Design Manual. 		
<p>6.2 Permanent erosion and sediment control – batter treatments</p> <p>Erosion of batters, cuttings and embankments can generate water quality issues associated with sedimentation and runoff containing contaminants, and air quality impacts associated with dust generation.</p>	Possible	Medium	Determine requirements for permanent erosion and sediment control measures on batters and cuttings.	Designer	Low
<p>6.3 Temporary erosion and sediment control – drainage</p> <p>The implementation of temporary drainage structures can potentially cause water quality issues associated with sedimentation and runoff containing contaminants, and air quality impacts associated with dust generation.</p> <p>.</p>	Possible	Medium	<p>Develop an erosion and sediment control plan and design criteria report during detailed design that demonstrates the works as designed will comply with the Best Practice Erosion and Sediment Control Guidelines (IECA 2008), including sediment basins, if identified through modelling.</p> <p>The B2N Project Contract Documentation is to specify early installation of temporary erosion and sediment control measures where practical. This may include initial clearing for the installation of temporary erosion and sediment controls, followed by clearing for bulk earthworks and subsequent construction activities.</p>	<p>Designer</p> <p>TMR</p>	<p>Medium</p> <p>Medium</p>
<p>6.4 Temporary erosion and sediment control – construction access tracks</p> <p>The construction and use of temporary construction access tracks can generate erosion issues, potentially causing water</p>	Possible	Medium	The B2N Project Contract Documentation is to specify requirements for the contractor to conduct all construction works within the limits of clearing.	TMR	Low

CONSTRAINT/ OPPORTUNITY	RISK LIKELIHOOD	RISK CONSEQUENCE	RECOMMENDATION/S	RESPONSIBILITY	RESIDUAL RISK
<p>quality issues associated with sedimentation and runoff containing contaminants, and air quality impacts associated with dust generation.</p> <p>Erosion can also result in impacts to aquatic fauna from increased sedimentation in watercourses.</p>					
<p>6.5 Temporary erosion and sediment control – earthworks and stockpile management</p> <p>Erosion of stockpiles can potentially cause water quality issues associated with sedimentation and runoff containing contaminants, and air quality impacts associated with dust generation.</p> <p>Erosion can also result in impacts to aquatic fauna from increased sedimentation in watercourses.</p>	Possible	Medium	<p>General erosion and sediment control measures to be incorporated into contract documentation including but not limited to:</p> <ul style="list-style-type: none"> • where practical, earthworks should be staged and programmed to avoid opening large sections of the alignment at one time. • where practical the construction program should specify early installation of temporary and, where possible, permanent erosion and sediment control measures. • strip and retain topsoil from the entire construction footprint. • stockpile topsoil separately to embankment and unsuitable material. • topsoil stockpiles shall be a maximum of 3m in height to avoid heat sterilisation of seed bank. • topsoil stockpiles to be stabilised and appropriate ESC to be installed. • stockpile locations should be located outside of sensitive areas including areas of established native vegetation, 	TMR	Low

CONSTRAINT/ OPPORTUNITY	RISK LIKELIHOOD	RISK CONSEQUENCE	RECOMMENDATION/S	RESPONSIBILITY	RESIDUAL RISK
			fauna habitat and within the Q5 flood zone of local waterways. <ul style="list-style-type: none"> • bunding of stockpile sites should occur to avoid overland flow entering the stockpiles. • stockpiles shall not be installed within the drip lines of trees. • mulching of cleared vegetation from the construction footprint and reuse as dust suppression and soil capping around the B2N Project. 		
6.6 Realignment of local roads and decommissioning of sections of local roads Without rehabilitation, areas of decommissioned roads can become infested with weeds and require ongoing management.	Possible	Medium	Where decommissioning or realignment of the existing rail or local roads is to occur, there is an opportunity to rehabilitate the decommissioned sections. The B2N Project Contract Documentation should include requirements for the rehabilitation of the decommissioned sections of existing rail or local road including: <ul style="list-style-type: none"> • removal of rail infrastructure • considerations for management of potentially contaminated materials • milling and removal of bitumen pavement • removal of any decommissioned culverts • tyning and ripping of base and sub-base material • application of soil ameliorants • topsoiling and/or compost blanket • planting and seeding. 	TMR	Low

CONSTRAINT/ OPPORTUNITY	RISK LIKELIHOOD	RISK CONSEQUENCE	RECOMMENDATION/S	RESPONSIBILITY	RESIDUAL RISK
<p>6.7 Known Contaminated Land Management</p> <p>The existing rail corridor and several other lots within the Project Area are listed on the Environmental Management Register. These will be subject to ground disturbing works during construction.</p>	Likely	Medium	<p>Potential contaminated sites were identified in the REF. Further contaminated land investigations should be carried out during detailed design to identify the extent of contamination and any other areas requiring management during construction or soil disposal permit.</p> <p>Known contaminated land management requirements must be incorporated into the Project Contract Documentation.</p>	TMR	Low
<p>6.8 Potential Contaminated Land Management (not previously identified)</p> <p>Sometimes site contamination is not expected and is detected after work commences.</p> <p>Uncovering contaminated material during excavation, e.g. waste dumps, asbestos or unexploded ordinances (UXO).</p> <p>Asbestos can be found when excavating old services pits or electrical service conduits, asbestos pipes, demolitions of old buildings (built prior to 1990), which is a potential risk during demolition of resumed buildings.</p> <p>Products that contain asbestos include vinyl floor tiles, cement roof sheeting and wall lining, lagging and joining material and fire blankets.</p>	Possible	Moderate	<p>Previously unidentified contaminated land management must be incorporated into design and contract documentation. This should include requirements to specify any notification requirements for the uncovering of contamination (not previously identified) during construction and demolition works such as waste dumps, asbestos or unexploded ordnance in the contract documentation prepared for the B2N Project.</p>	TMR	Low

CONSTRAINT/ OPPORTUNITY	RISK LIKELIHOOD	RISK CONSEQUENCE	RECOMMENDATION/S	RESPONSIBILITY	RESIDUAL RISK
7. Flora and Fauna					
7.1 Removal of fauna habitat within the Project Area	Almost Certain	Moderate	<p>Conduct frog survey in accordance with the <i>Survey Guidelines for Australia's Threatened Frogs</i> to determine the presence and distribution of threatened frogs (acid frogs, Giant Barred Frog, Tusked Frog) within the B2N Project Area. This will help refine fauna management requirements including exclusion fencing and the installation of fauna underpasses. These surveys will consider both species presence and the presence of animal breeding habitat.</p> <p>The loss of foraging resources (flowering trees, fleshy fruits) for the Regent Honeyeater, Swift Parrot, Grey-headed Flying-fox will need to be quantified to inform the EPBC Act Referral. This can be achieved by deriving seasonal food resource maps based on existing vegetation descriptions (i.e. species composition) and mapping.</p> <p>Conduct surveys of Grey-headed flying fox roosts at Palmwoods to determine presence and potential impacts. This will help refine management requirements for this species.</p> <p>Animal breeding place surveys are required to document their distribution and abundance (e.g. hollow-bearing trees, creeks and other waterbodies). Pre-clearing surveys of these structures will be required to determine whether the</p>	Detailed Design Contractor	Medium

CONSTRAINT/ OPPORTUNITY	RISK LIKELIHOOD	RISK CONSEQUENCE	RECOMMENDATION/S	RESPONSIBILITY	RESIDUAL RISK
			<p>structure is an actual animal breeding place.</p> <p>Confirm the need for Species Management Programs (SMPs) for Least Concern, Endangered, Vulnerable or Near Threatened fauna species impacted by the B2N Project (i.e. are any species likely to breed within the Project Area).</p> <p>Conduct an assessment of significance under the EPBC Act for all TECs and threatened and migratory species known or likely to occur within the Project Area. A conclusion of a significant impact on any MNES would require an EPBC referral to the Commonwealth Department of Environment for a controlled action determination.</p> <p>Minimise clearing width of rail corridor and construction footprint to minimise loss of native vegetation, particularly where the rail corridor passes through TECs, REs and habitat for threatened species.</p> <p>The clearing limit of formation footprint plus 3m should be employed as a general clearing limit.</p> <p>Identify areas where ancillary activities such as stockpile areas, spoil areas, laydown areas, site office and workshops should not be located (i.e. outside of areas of fauna habitats).</p> <p>Identify environmentally sensitive areas as no entry zones in detailed design</p>		

CONSTRAINT/ OPPORTUNITY	RISK LIKELIHOOD	RISK CONSEQUENCE	RECOMMENDATION/S	RESPONSIBILITY	RESIDUAL RISK
			<p>documentation. The clearing limit should be minimised further where the works area is adjacent to high value habitat and known habitat areas.</p> <p>Exclusion zones should be identified as:</p> <ul style="list-style-type: none"> • habitat of threatened species • endangered and of concern regional ecosystems (REs) • National Parks. <p>Where possible, the clearing footprints should be restricted to avoid unnecessary clearing of habitat trees, particular along creek lines that are identified as fauna corridors.</p> <p>Conduct additional field investigations and research to support relevant permits and approvals including:</p> <ul style="list-style-type: none"> • EPBC Act referral and assessment (where applicable) • water licence and waterway barrier works if applicable • Species Management Program • offset requirements (EPBC Act or Qld Offsets Act) • clearing requirements (e.g. breeding periods of protected species). <p>Review requirements for maintaining habitat connectivity including fauna crossings, fauna furniture. Integrate fauna crossings and fauna furniture into design documentation along with fencing to</p>		

CONSTRAINT/ OPPORTUNITY	RISK LIKELIHOOD	RISK CONSEQUENCE	RECOMMENDATION/S	RESPONSIBILITY	RESIDUAL RISK
			exclude fauna from high risk areas and direct them to crossings.		
<p>7.2 Loss of native vegetation</p> <p>Direct removal of native vegetation including Regional Ecosystems (REs) listed as Of Concern or Endangered under the <i>Vegetation Management Act 1999</i>.</p> <p>Locating ancillary activities outside the clearing footprint further than necessary may result in additional loss of native vegetation.</p>	Almost Certain	Moderate	<p>Minimise clearing width of the B2N Project and the construction footprint to minimise loss of native vegetation. The clearing limit of formation footprint plus 3m should be employed as a general clearing limit.</p> <p>Identify potential locations for ancillary activities such as stockpile areas, spoil areas, laydown areas, site office and workshops outside of areas of native vegetation.</p> <p>Identify environmentally sensitive areas as exclusion zones in detailed design documentation. The clearing limit should be minimised further where works area adjacent to high value habitat and known habitat areas.</p> <p>Exclusion zones should be identified as:</p> <ul style="list-style-type: none"> • habitat of threatened species • endangered and of concern regional ecosystems (REs) • National Parks <p>Where possible, clearing footprints should be restricted to avoid unnecessary clearing of habitat trees, particular along creek lines that are identified as fauna corridors.</p>	Detailed Design Contractor	Low
			Specify in B2N Project Contract Documentation requirements for staged and sequential clearing, along with	TMR	Low

CONSTRAINT/ OPPORTUNITY	RISK LIKELIHOOD	RISK CONSEQUENCE	RECOMMENDATION/S	RESPONSIBILITY	RESIDUAL RISK
			requirements for early installation of fauna fencing (where practical and feasible).		
<p>7.3 Potential loss of threatened flora species</p> <p>Direct removal of threatened or other native flora species through vegetation clearing, thus resulting in a decrease in biodiversity within the Project Area.</p> <p>The B2N Project is within a Protected Plants High Risk Trigger Area and will require a Protected Flora Survey in accordance with DES Guidelines.</p>	Possible	Moderate	<p>Conduct discussions with DES to confirm if the Plunkett mallee (<i>Eucalyptus curtisii</i>) identified growing in advanced regeneration are considered to be 'in the wild' and therefore protected under the NC Act.</p> <p>Conduct Protected Plants Flora Survey to comply with the DES protected plants survey requirements.</p> <p>Consider requirements for offsets under the <i>Environmental Offsets Act 2014</i>.</p>	Detailed Design Contractor/ TMR	Low
			Specify in B2N Project Contract Documentation any further conditions for pre-clearing surveys prior to construction.	TMR	Low
<p>7.4 Weed Management</p> <p>Potential spread of weeds, particularly restricted category 3 weeds, through vehicle movements for the B2N Project.</p> <p>Degradation of native habitat through introduction or spread of invasive flora species.</p>	Possible	Moderate	<p>Previous investigations have identified a number of invasive weeds in the Project Area.</p> <p>If site washdown is necessary, a temporary wash down bay (specific design) should be constructed to ensure weed seeds are contained and removed for subsequent disposal. Any such facility should be constructed at least 50m away from watercourses and drainage lines.</p> <p>Specify in B2N Project Contract Documentation requirements for weed survey and monitoring prior to and during construction.</p>	TMR	Low

CONSTRAINT/ OPPORTUNITY	RISK LIKELIHOOD	RISK CONSEQUENCE	RECOMMENDATION/S	RESPONSIBILITY	RESIDUAL RISK
<p>7.5 Fragmentation of terrestrial fauna habitat</p> <p>Prevention of fauna movement along vegetation corridors. This has the potential to limit availability of resources and suitable habitat.</p> <p>Isolation of populations or overpopulation of a particular species may occur in small patches, causing a decline in available resources.</p> <p>The construction of the new alignment will dissect a number of regionally significant fauna corridors, which are already dissected by the existing rail and parts of the road network.</p>	Likely	Moderate	<p>Detailed design should incorporate habitat fragmentation mitigation measures including:</p> <ul style="list-style-type: none"> • construction footprint and clearing width to be minimised through the following areas: <ul style="list-style-type: none"> — mapped REs — habitat areas for protected species — National Parks <p>Work areas, access routes and stockpiles to be placed outside of mapped RE areas and in cleared areas where possible.</p> <p>Vegetation corridors should be retained or re-established where possible.</p> <p>Clearly delineate exclusion zones, limited access areas and sensitive environments on design drawings.</p> <p>Design bridge structures to facilitate fauna passage at purple and red waterway crossings, where practicable. Bridges are to be used in preference to culverts as they allow revegetation and easy fauna movement.</p> <p>Design new culverts with fauna friendly design features, and ensure culvert sizing allows both conveyance of flows and fauna passage. Ideally separate culverts should be provided to provide for dry fauna passage.</p> <p>Fauna friendly bridges and culverts should be designed with reference to the TMR Fauna Sensitive Road Design Volume 1</p>	Detailed Design Contractor	Low

CONSTRAINT/ OPPORTUNITY	RISK LIKELIHOOD	RISK CONSEQUENCE	RECOMMENDATION/S	RESPONSIBILITY	RESIDUAL RISK
			<p>and Volume 2 (DTMR 2000 and DTMR 2010).</p> <p>Fauna passage at Beerburum East State Forest should consider the need for rope bridge structures over the B2N Project.</p> <p>Fencing of the rail corridor to encourage fauna to use provided crossings and exclude fauna from other areas.</p> <p>Generally, fauna fencing should extend for 200m either side of a fauna crossing, to guide fauna to the crossing point. In many places, fauna fencing could be designed to exclude fauna from the road network as well as the rail corridor. Some rationalisation of fauna fencing lengths at the nominated fauna crossing locations may be required due the location of the new (or upgraded) rail corridor in relation to the road network. In some locations, 200m either side of a nominated fauna crossing location is not practical and further assessment and design will be required.</p> <p>Integrate escape opportunities for fauna that inadvertently enter the rail corridor.</p>		
			<p>Specify in B2N Project Contract Documentation requirements for staged and sequential clearing, along with requirements for early installation of fauna fencing (where practical and feasible).</p> <p>Also specify in B2N Project Contract Documentation requirements for</p>	TMR	Low

CONSTRAINT/ OPPORTUNITY	RISK LIKELIHOOD	RISK CONSEQUENCE	RECOMMENDATION/S	RESPONSIBILITY	RESIDUAL RISK
			<p>revegetation of areas disturbed during construction of bridges and culverts using native ground and shrub species. This is especially important for Sites D and E in Bluegum Creek, Site G at Back Creek, Site J1 in the Tibrogargan Creek system and Site A in Little Rocky Creek which have a high likelihood of supporting threatened “wallum” fish species.</p>		
			<p>Design waterway crossing structures to incorporate fauna crossings for terrestrial fauna, in particular ground-dwelling and arboreal mammals and ground-dwelling birds.</p> <p>Appropriate underpass fauna crossings are detailed in <i>Fauna Sensitive Road Design Manual Volume 2: Preferred Practices</i> (TMR, 2010). Bridge structures are preferred, as they provide suitable crossing for all terrestrial fauna species. In particular, design recommendations to be considered for bridges include:</p> <ul style="list-style-type: none"> • restore or maintain, where practical, continuous riparian cover along both channel banks. If restoring both banks is not practical, then priority should be given to the bank which is more likely to form part of a fauna movement path. • where possible, move bridge abutments away from watercourse banks to increase opportunity for terrestrial passage along the banks and overbank 	Detailed Design Contractor	Low

CONSTRAINT/ OPPORTUNITY	RISK LIKELIHOOD	RISK CONSEQUENCE	RECOMMENDATION/S	RESPONSIBILITY	RESIDUAL RISK
			<p>areas. (Consideration needs to be given to low flow paths.)</p> <ul style="list-style-type: none"> • provide vertical logs cast into concrete footings attached to underside of bridge or top of arch spans for arboreal mammals. • retain in-stream pools through maintaining existing hydrology patterns. • minimise clearing footprint in and around watercourses. Consider revegetation around the structures and the potential to revegetate with suitable low-growing native species under the bridge to provide habitat and protection from predators for fauna moving along the watercourse. • a 3m x 3m box culvert is generally considered suitable to accommodate a wide variety of terrestrial fauna species (including macropods, koalas and flightless birds). • to encourage the passage of a variety of small to large fauna species, a minimum vertical clearance of three to five metres is considered necessary. • provide a substrate as natural as possible. Gravel, mulch or embedded rocks in the bottom of the culvert if surrounding substrate cannot be replicated. Surfaces with a gradient are to be roughed for ease of movement through the crossing. • openings are to lead directly into the habitat (not concrete) to ensure a 		

CONSTRAINT/ OPPORTUNITY	RISK LIKELIHOOD	RISK CONSEQUENCE	RECOMMENDATION/S	RESPONSIBILITY	RESIDUAL RISK
			<p>continuum of habitat to the underpass entrance.</p> <ul style="list-style-type: none"> plant entrances with appropriate vegetation, e.g. shrubs and grassy groundcover. Locally indigenous species is suggested. provide a dry ledge or similar. Where practical, horizontal logs may be used for passage as high above the base of the opening as practical, allowing 0.6m ceiling clearance for fauna passage. general reptile furniture includes tiles, logs, mulching and stones and will increase the likelihood of usage by reptile species. <p>For both bridges and culverts intended as terrestrial fauna crossing structures:</p> <ul style="list-style-type: none"> consider exclusion fencing either side of the intended fauna crossing structures. The fence for koala habitat areas must comply with TMR Standard Drawing 1603. Extend fauna fencing on either side of a safe crossing point to act as a funnel to guide animals. 200m is recommended, but this is dependent on environmental conditions such as topography and vegetation. <p>NOTE: These recommendations are in addition to fish passage requirements stipulated in Item 3 of this table.</p>		
7.6 Impacts to aquatic fauna habitat	Possible	Major	Design waterway crossings to minimise impacts to waterways. Refer to DAF's	Detailed Design Contractor	Medium

CONSTRAINT/ OPPORTUNITY	RISK LIKELIHOOD	RISK CONSEQUENCE	RECOMMENDATION/S	RESPONSIBILITY	RESIDUAL RISK
The construction of waterway crossings has the potential to both disrupt fauna habitat connectivity and generate downstream sedimentation impacts, alter velocities and impact aquatic habitats.			<p>‘What is not a waterway barrier work’ fact sheet.</p> <p>Site bridges perpendicular to waterway where possible.</p> <p>Pylons and other structures are to be placed outside of the channel and above the high water mark where possible, avoiding placement in the low flow channel and retaining the existing waterway channel form and hydraulic function where possible.</p> <p>Design drainage and stormwater quality devices to minimise downstream impacts and effects.</p> <p>Develop an erosion sediment control plan during detailed design that demonstrates the works as designed will comply with the <i>Best Practice Erosion and Sediment Control Guidelines</i> (IECA 2008), including sediment basins. This includes:</p> <ul style="list-style-type: none"> • identify points of cross-flow and install clean water diversions across the B2N Project to minimise the amount of overland flow entering the site and becoming contaminated. • inclusion of “wet” sediment basins if required in response to water quality modelling undertaken as part of item 3 of this table. 	TMR	Medium
			The B2N Project Contract Documentation is to specify early installation of temporary erosion and sediment control measures where practical. This may include initial		

CONSTRAINT/ OPPORTUNITY	RISK LIKELIHOOD	RISK CONSEQUENCE	RECOMMENDATION/S	RESPONSIBILITY	RESIDUAL RISK
			clearing for the installation of temporary ESC controls, followed by clearing for bulk earthworks and subsequent construction activities.		
7.7 Fauna injury and mortality Construction vehicles, trains and operational vehicles pose a threat to fauna through vehicle strike.	Rare (Construction) Likely (Operation)	Minor (Construction) Moderate (Operation)	<p>Incorporate fauna fencing in the design. Locate fencing so that fauna are protected from predators/pests/disturbances.</p> <p>Design in accordance with relevant standards (TMR Standard drawing 1603) and guidelines to ensure that fencing does not trap animals, especially during fire.</p> <p>Design fencing in a manner that guides fauna towards associated underpasses.</p> <p>Design to incorporate regular fence breaks where fauna exclusion fencing is to be installed, in areas that do not have crossing structures.</p> <p>Signs may be erected near fence breaks to alert drivers that fauna may be crossing.</p> <p>Include a 'return' design at the end of fencing to direct animals towards the habitat. The return should extend a minimum of 10m. Alternatively, placing boulders at the end may encourage fauna to return to intact habitat.</p> <p>Provide exit points to enable animals caught within the rail corridor access to the adjacent habitat. Refer to 'one way fence' design in accordance with the TMR Fauna Sensitive Road Design Manual.</p>	Detailed Design Contractor	Low

CONSTRAINT/ OPPORTUNITY	RISK LIKELIHOOD	RISK CONSEQUENCE	RECOMMENDATION/S	RESPONSIBILITY	RESIDUAL RISK
7.8 Location of ancillary activities Ancillary activities including site offices, laydown areas and stockpile sites are temporary activities that may generate additional clearing requirements.	Possible	Moderate	Ancillary activities such as stockpile areas, spoil areas, laydown areas, site office and workshops are to be located within already cleared areas as a priority.	Detailed Design Contractor	Low
			Requirements for revegetation and rehabilitation of ancillary works areas are to be included in the B2N Project Contract Documentation. Also note in the B2N Project Contract Documentation any ancillary works requiring additional clearing of habitat or vegetation may require further assessment and approval if not identified during detailed design or included within the area for the EPBC Act Referral.	TMR	Low
7.9 Potential impacts on environmentally sensitive areas Environmentally sensitive areas include: <ul style="list-style-type: none"> • Watercourses and riparian corridors • Remnant REs • Threatened species habitat areas • Protected areas including adjacent National Parks and State Forest 	Possible	Major	Environmentally sensitive areas are to be identified as exclusion zones and included in design documents. Clearing width of the rail corridor is to be minimised, particularly where it passes through environmentally sensitive areas.	Detailed Design Contractor	Low
7.10 Dewatering of farm dams Dewatering of farm dams may impact upon aquatic fauna within the dam and terrestrial fauna around the dam.	Possible	Major	Include contractual requirements for monitoring dewatering and specifying fish and fauna salvage plans as part of the B2N Project Environmental Management Plan Construction. Include requirement for Contractor to prepare a Dewatering Plan to for approval by the Contract Administrator and DES.	TMR	Low

CONSTRAINT/ OPPORTUNITY	RISK LIKELIHOOD	RISK CONSEQUENCE	RECOMMENDATION/S	RESPONSIBILITY	RESIDUAL RISK
			The Contract Administer is to be notified prior to any dewatering activities to notify DES of the works occurring.		
<p>7.11 Fauna management during clearing</p> <p>Potential for fauna injury or mortality during vegetation clearing.</p> <p>An approved Species Management Program will be required if breeding habitat is confirmed in the construction footprint.</p>	Possible	Major	<p>A low risk SMP species would be required if breeding habitat is identified for Least Concern species only. This excludes special least concern species and colonial breeders. TMR's existing Species Management Program for Least Concern Species will likely apply to the works, but should be reviewed to ensure all aspects of the B2N Project are addressed.</p> <p>A high risk SMP would be required if breeding habitat for least concern colonial breeders, special least concern, extinct in the wild, endangered, vulnerable or near threatened species is identified.</p> <p>These recommendations should be incorporated into the contractual documents, and may include additional fauna monitoring during construction.</p>	TMR	Low
<p>7.12 Pest animals including Invasive Ants Management</p> <p>Red imported fire ants and yellow crazy ants are significant environmental and human hazards. Construction activities involving the movement of soil from one location to another have the potential to spread these pests.</p>	Possible	Major	The B2N Project Contract Documentation is to specify requirements for compliance with RIFA biosecurity management protocols.	TMR	Low
8.0 Cultural Heritage					

CONSTRAINT/ OPPORTUNITY	RISK LIKELIHOOD	RISK CONSEQUENCE	RECOMMENDATION/S	RESPONSIBILITY	RESIDUAL RISK
<p>8.1 Indigenous Cultural Heritage</p> <p>In accordance with the ACHA, all persons in Queensland have a Duty of Care to take all reasonable and practicable measures to ensure they do not harm Aboriginal cultural heritage whenever they undertake an activity. The ACHA provides a number of processes that allow a person undertaking an activity to meet their Duty of Care, including an assessment of the proposed activity against the Duty of Care Guidelines (undertaking a cultural heritage risk assessment).</p> <p>Some B2N Project activities will be undertaken in areas not previously subject to significant ground disturbance or surface disturbance. Project activities in these areas would meet Category 5 of the Duty of Care Guidelines. This means there is a high risk that activities could harm Aboriginal cultural heritage and further assessment would be required.</p> <p>The remaining portion of the proposed B2N Project activities would be carried out in a 'Developed Area'. There is evidence of prior significant ground disturbance across some of the Project Area. Within these areas, the proposed activities would meet Category 3 of the Duty of Care Guidelines. This means that it is generally unlikely that the activity will harm Aboriginal cultural heritage, no additional assessment is</p>	Likely	Moderate	<p>In the event that changes/amendments to the alignment occur, potential areas of high risk not identified in this assessment should be identified in order to reduce the potential for B2N Project activities to cause harm to Aboriginal cultural heritage. This should be undertaken prior to any field assessment.</p> <p>A targeted Aboriginal Cultural Heritage Field Assessment of areas where proposed works will occur in places identified as Category 4 and 5 should be undertaken.</p> <p>Any field assessment must be undertaken by a suitably qualified archaeologist, in association with the relevant Aboriginal party.</p> <p>High risk areas include:</p> <ul style="list-style-type: none"> • All creek crossings where works will impact the ground surface within the current rail alignment. • All areas of previously undisturbed land/remnant vegetation within the Project Area. • All creek crossings where works will occur outside the current rail alignment. • Areas where works will be occurring within proximity of the seven Aboriginal cultural heritage sites (KB:D96; KC:E28; KC:F51; KC:F56; KC:G76; KC:G88; KC-0002-1 and KC-0002-2)) located within 500m of the Project Area. 	TMR	Low

CONSTRAINT/ OPPORTUNITY	RISK LIKELIHOOD	RISK CONSEQUENCE	RECOMMENDATION/S	RESPONSIBILITY	RESIDUAL RISK
<p>required, and the activity could proceed in compliance with the Duty of Care Guidelines.</p> <p>Additionally, the proposed B2N Project activities will traverse, or be in close proximity to, landscapes which have a higher risk of Aboriginal Cultural Heritage being present. High risk landscapes include those where natural landscape features are present, such as rock outcrops, caves, wetlands, permanent water holes, creeks, springs, hills and mound formations.</p>			Preparation of a Cultural Heritage Management Plan / Aboriginal party agreement in consultation with the Kabi Kabi First Nation Registered Native Title Claimant.	TMR	Low
<p>8.2 Non-Indigenous Cultural Heritage</p> <p>The Historic Heritage Assessment identifies State listed places, and several local or QR listed places of significance in or adjacent to the Project Area.</p>	Likely	Moderate	<p>For all places identified as being significant and potentially impacted by the B2N Project, additional and detailed historical research and significance assessment (using the criteria in the <i>Queensland Heritage Act 1992</i>) is undertaken to confirm the preliminary significance assessment and further inform specific recommendations made for mitigation at each place.</p> <p>Where impacts have been identified to heritage places, consideration be given to other acceptable design and construction options to avoid or minimise impacts wherever possible.</p> <p>Consultation with SCC is recommended where impacts have been identified to heritage places listed in the SCC planning scheme.</p>	TMR	Low

CONSTRAINT/ OPPORTUNITY	RISK LIKELIHOOD	RISK CONSEQUENCE	RECOMMENDATION/S	RESPONSIBILITY	RESIDUAL RISK
			<p>Consultation with relevant community stakeholders is recommended for all heritage places that will be impacted.</p> <p>Specific SCC and community stakeholder consultation concerning the possible relocation of the Flinders Monument, Glass House Mountains, be undertaken.</p> <p>Where existing stations upgrades are going to impact on the cultural heritage significance of the Landsborough, Palmwoods and Woombye Stations, it is recommended that upgrades retain the local character of station complexes by avoiding or minimising impacts and also through sympathetic design choices.</p> <p>Where removal of significant fabric is unavoidable, archival recording of that fabric is completed prior to its removal.</p> <p>In order to mitigate inadvertent and indirect impacts, the following is recommended, a discoveries procedure for the entire B2N Project is recommended to be implemented to ensure compliance with archaeological requirements of the <i>Queensland Heritage Act 1992</i>.</p>		
9. Noise and Vibration					
9.1 Operational Noise Noise modelling undertaken during the Business Case phase focused on the rail corridor. This identified one location	Likely	Moderate	Review the outputs from the Business Case phase noise modelling, and design noise treatments in accordance with the recommendations.	Detailed Design Contractor	Low

CONSTRAINT/ OPPORTUNITY	RISK LIKELIHOOD	RISK CONSEQUENCE	RECOMMENDATION/S	RESPONSIBILITY	RESIDUAL RISK
where noise treatments would be required.			At grade separation locations, conduct separate road noise assessments in accordance with the TMR Transport Noise Management Code of Practice 2016.		
9.2 Construction Noise Environmental nuisance/ noise impacts at sensitive receptors impact amenity and health.	Likely	Major	Prepare an approved Compliance Management Plan as part of Project Contract Documentation.	TMR	Medium
9.3 Vibration Vibration can impact structures, create environmental nuisance health and amenity impacts.	Possible	Major	Specify requirements for condition surveys prior to construction commencing in Project Contract Documentation, along with corrective actions if vibration complaints are received.	TMR	Low
10. Land Use and Planning					
10.1 Land Use Changes	Possible	Moderate	This assessment has been conducted prior to obtaining specific community feedback on the duplication works. Therefore, it will need to be reviewed in light of any new information provided. Elements of the B2N Project that have not been previously spatially defined include the current grade separation proposals for Barrs Road and Caloundra Street at Landsborough; station upgrade works at Mooloolah, Eudlo, Palmwoods and Woombye; station car park expansion at Beerburum, Landsborough and Nambour; and passing loop extensions at Eudlo and Woombye. In addition, some of local road network improvements are also newly defined.	TMR	Low

CONSTRAINT/ OPPORTUNITY	RISK LIKELIHOOD	RISK CONSEQUENCE	RECOMMENDATION/S	RESPONSIBILITY	RESIDUAL RISK
			<p>Consultation with affected landowners and business owners, and the continuation of consultation with landowners impacted by the Protected Corridor, will be required.</p> <p>Ongoing consultation with SCC Councillors and Officers will be necessary to ensure the optimum outcome for these hinterland townships and surrounding areas. Opportunities for master planning in station precincts should be aligned with council master planning and streetscape treatment plans, so that benefits can be optimised.</p>		
<p>10.2 Native Title</p> <p>The B2N Project is located within the Kabi Kabi First Nation Native Title claim area, registered on 7 August 2013. Native Title assessments have been undertaken by Building Queensland for properties identified as being impacted by the Protected Corridor. These assessments have identified the following:</p> <ul style="list-style-type: none"> • Freehold land: not subject to Native Title • Beerburrum State Forest East: may be subject to Native Title • Beerburrum State Forest West: not subject to Native Title • Existing rail corridor: not subject to Native Title, with the exception of two portions where further investigations are ongoing to determine status 	Likely	Moderate	<p>Review outcome of Native Title assessments during Business Case Phase, particularly where property impacts may have changed.</p> <p>The grant of a perpetual lease will require Native Title currently existing over the affected land to first be extinguished either by being voluntarily surrendered to the State, under a registered Indigenous land use agreement (ILUA) with the appropriate Native Title parties, or else compulsorily acquired by the State.</p> <p>Ensure that the necessary processes are conducted to achieve compliance with the future act requirements of the <i>Native Title Act 1993</i>. The compulsory acquisition process must mirror the process for resuming fee simple estates and also</p>	TMR	Low

CONSTRAINT/ OPPORTUNITY	RISK LIKELIHOOD	RISK CONSEQUENCE	RECOMMENDATION/S	RESPONSIBILITY	RESIDUAL RISK
<ul style="list-style-type: none"> • Roads: Red Road, Railway Parade Glass House Mountains, unformed roads on east side of the North Coast Line between Glass House Mountains to Back Creek Road, and three other roads will be subject to Native Title • Creeks: all subject to Native Title with the exception of any area where there is an existing road bridge (with a 30m buffer either side) or existing rail bridge (20m buffer either side). • Reserves: two with potential to be subject to Native Title <p>Where Native Title exists over a land parcel required for the B2N Project, Native Title suppression or acquisition (via resumption or surrender) will be required.</p>			<p>include the additional steps listed in s24MD(6B) of the <i>Native Title Act 1993</i>.</p> <p>Verify that construction works are permissible and provide written verification in B2N Project Contract Documentation</p> <p>Ensure that currency of Native Title Assessments is maintained.</p> <p>Address any Native Title issues relating to the State Forest Revocation Process.</p> <p>TMR to provide Technical Specifications to the Contractor</p>		
11. Resource Use and Management					
11.1 Waste Management	Possible	Medium	<p>Balance the earthwork cut and fill and minimising where possible the distance travelled between cut and fill locations. Where fill is to be brought onsite, designing the receipt of that fill to be the shortest possible distance to the source.</p> <p>Design water management structures to capture sufficient water for use onsite and access to these areas so the water can be collected and used.</p> <p>Explore the potential for re-use of materials from the existing corridor, taking into consideration the potential for contaminated material to be present.</p>	Detailed Design Contractor	Low

CONSTRAINT/ OPPORTUNITY	RISK LIKELIHOOD	RISK CONSEQUENCE	RECOMMENDATION/S	RESPONSIBILITY	RESIDUAL RISK
11.2 Suitable Material Use and Long term Stockpiling	Possible	Medium	Specify requirements for long term stockpile placement and management (where required) in B2N Project Contract Documentation.	TMR	Low
11.3 Unsuitable Material Treatment, Use, Temporary Stockpiling and Disposal	Possible	Medium	Specify requirements for management of unsuitable material and temporary stockpiling and management (where required) in B2N Project Contract Documentation. Refer contaminated land procedures for management of contaminated material.	TMR	Low
11.4 Materials Sourcing	Possible	Medium	Consider the following opportunities to incorporate sustainability initiatives into the B2N project during design and development of project specifications: <ul style="list-style-type: none"> • energy efficient measures to reduce fuel and energy usage • conservation of water resources • reuse of materials and the use of recycled construction materials • minimisation of the generation of waste. 	Detailed Design Contractor	Low
12. Other Activity Requirements					
12.1 Hazardous Chemical Management	Possible	Major	Specify any additional management requirements in B2N Project Contract Documentation	Designer	Insignificant
12.2 Severe Weather Management, e.g. flooding, tropical cyclone, extreme temperatures, bushfire etc. Also refer to item 1 of this table.	Possible	Major	TMR and its advisors will use their best endeavours to ensure all practicable measures are taken to reduce the impact	TMR and Detailed Design Contractor	Medium

CONSTRAINT/ OPPORTUNITY	RISK LIKELIHOOD	RISK CONSEQUENCE	RECOMMENDATION/S	RESPONSIBILITY	RESIDUAL RISK
			<p>of severe weather at the site. Measures to consider include:</p> <p>Scheduling contract award such that construction work may be undertaken outside high risk periods, such as the wet season to the maximum extent possible.</p> <p>Identifying opportunities to amend technical specifications to better manage the works constructed during the wet season.</p> <p>Reviewing the tender validity period, as a long period (90 to 180 days) can adversely affect the contractor's ability to program the works.</p> <p>Reducing construction risk through appropriate design (e.g. design reinforced concrete pipes in gullies where flash flooding could occur rather than reinforced concrete box culverts which require cast in place slabs etc.).</p> <p>Designing solutions that allow quicker construction time in high risk areas, i.e. a design solution whereby the contractor can choose a 'period of opportunity' to construct the works before more floods arrive. Lower risk solutions will normally allow for greater use of precast materials rather than cast in situ.</p> <p>Include in B2N Project Contract Documentation the requirement for the Contractor to prepare and implement a Severe Weather Management Plan to minimise the impact of severe weather on</p>		

CONSTRAINT/ OPPORTUNITY	RISK LIKELIHOOD	RISK CONSEQUENCE	RECOMMENDATION/S	RESPONSIBILITY	RESIDUAL RISK
			works under construction in accordance with TMR's Engineering Policy 146, Severe Weather Management Plans dated January 2014, where applicable.		

Appendix A Environmental and Heritage Impact Risk Evaluation Criteria

Risk assessment and ratings are to be conducted in accordance with TMR's Risk Assessment and Ratings Matrix published on TMR's Risk Management Tools and Techniques intranet site.

The identification and assessment of likely impacts of the Project have been discussed for each environmental factor. The significance of the residual impact of the Project, taking into consideration the full implementation of these recommendations, is also determined.

Table 4: Environment-related Impact Consequence Ratings

Consequence	Environmental and Cultural Impacts	Media and reputational	Legal and Compliance
Severe	<p>The event will permanently impact on the environment, air quality or community health.</p> <p>The impact covers a wide area and is difficult to contain.</p> <p>The effects are irreversible.</p> <p>Threat to survival of flora, fauna and/or cultural heritage.</p>	<p>Significant adverse community impact and condemnation (months).</p> <p>Consistent extreme negative media attention (months).</p> <p>Irreconcilable community loss of confidence in the organisation's intentions and capabilities and possibly in government Public Government intervention.</p>	<p>Will result in significant litigation activities and fines. May involve class actions.</p> <p>Will result in a major breach (noncompliance) with regulation/legislation that requires parliamentary enquiry.</p>
Major	<p>Medium to long-term impact on the environment, air quality or community health.</p> <p>Impacts cover a wide area but can be contained.</p> <p>Able to be remedied but will require dedicated expert resources</p>	<p>Considerable and prolonged community impact and dissatisfaction publicly expressed.</p> <p>Community loss of confidence in the organisation's capabilities (weeks).</p> <p>Consistent negative media attention (weeks).</p> <p>Ministerial intervention</p>	<p>May result in litigation, requiring significant dedicated time by legal counsel to address liability and consequences.</p> <p>Will result in a major breach (noncompliance) with regulation/legislation.</p>
Medium	<p>Medium-term impact on the environment, air quality or community health, limited to a small area.</p> <p>Able to be remedied but may require intervention or management by external parties.</p>	<p>Sectional community impacts and concerns publicly expressed (days).</p> <p>Negative media attention (days).</p> <p>Loss of confidence by the community in the organisation's processes.</p> <p>Ministerial concern expressed.</p>	<p>Would result in a serious issue requiring investigation and advice into legal liability.</p> <p>May require external counsel advice.</p> <p>Will result in non-compliance with regulation or legislation.</p>
Minor	<p>Short-term impact on the environment, air quality or community health, limited to a small area.</p> <p>Able to be remedied through existing process.</p> <p>Minimal threat to fauna, flora or cultural heritage.</p>	<p>Local community impacts and concerns.</p> <p>Occasional once off negative media attention.</p> <p>Isolated local community concerns.</p>	<p>Would result in more complex legal issues but these are able to be managed by in-house legal staff.</p> <p>May result in minor non-compliance with regulation/legislation.</p>
Insignificant	<p>No measurable effect on the environment, air quality or community health.</p> <p>No action required for management or containment</p> <p>Minimal threat to fauna, flora or cultural heritage</p>	<p>Individual's issue-based concerns.</p> <p>No media coverage</p>	<p>Issues arise but are able to be managed by routine procedures.</p> <p>Would not affect compliance with regulation or legislation.</p>

Table 5: From TMR's Risk Assessment and Rating Matrix Impact likelihood criteria

Likelihood	Expected or Actual Frequency Experienced
Rare	<p>This event may have happened previously in TMR or in 'like' organisations. However, in the absence of other information or exceptional circumstances it would not be expected to happen in TMR in the foreseeable future.</p> <p>There is less than a 5% chance of the event happening in the next 12 months. It is likely to occur less than once in 15 years.</p>
Unlikely	<p>The event has occurred infrequently in TMR or 'like' organisations. Current controls and circumstances suggest the occurrence would be considered highly unusual.</p> <p>There is between a 5 to 30% chance of the event happening in the next 12 months. It is likely to occur once in 8 to 20 years.</p>
Possible	<p>This event may have occurred occasionally in TMR or 'like' organisations. Current controls or circumstances suggest there is a distinct possibility of occurrence.</p> <p>There is between a 30 to 60% chance of the event happening in the next 12 month. It is likely to occur once in 5 to 7 years.</p>
Likely	<p>This event may have occurred in TMR or 'like' organisations on a regular basis. With current controls or circumstances you can expect occurrence within the financial year.</p> <p>There is a 60 to 90% chance of the event happening in the next 12 months. It is likely to occur once in 1 to 4 years.</p>
Almost certain	<p>This event occurs frequently within TMR or with current controls or circumstances you expect an occurrence.</p> <p>There is a greater than 90% chance of the event happening in the next 12 months. It is likely to occur at least once over the next 12 months.</p>

Table 6: Risk evaluation matrix

Consequence	Likelihood				
	Rare	Unlikely	Possible	Likely	Almost certain
Severe	High	High	High	Extreme	Extreme
Major	Medium	Medium	High	High	Extreme
Moderate	Medium	Medium	High	High	High
Minor	Low	Low	Medium	Medium	High
Insignificant	Low	Low	Low	Medium	Medium

Table 7: Criteria for determining risk treatment requirements

RISK SIGNIFICANCE	CRITERIA	
	Initial Impact (before mitigation)	Residual Impact (post mitigation)
Low	<p>In the absence of project-specific mitigation measures, works are likely to result in only minor, short-term impacts to a factor of limited significance.</p> <p>Standard environmental management measures suitable risk management.</p>	Implementation of recommended mitigation measures may still result in impacts occurring but are likely to be minor and / or short-term in nature.
Medium	<p>In the absence of project-specific mitigation measures, major but recoverable impacts to a factor of significance are likely.</p> <p>Site-specific management of this risk is required.</p>	Implementation of recommended mitigation measures may reduce the severity of impacts but are still likely to result in major impacts of short / medium duration.
High	<p>In the absence of project-specific mitigation measures, large-scale, long-term and / or irreversible impacts to a factor of high significance are likely.</p> <p>A project shall consider methods of avoidance, mitigation and management for high significance risks. It may be necessary to consult administering authorities and public consultation to manage reputational impacts.</p>	Implementation of recommended mitigation measures is unlikely to significantly reduce impacts such that large-scale, long-term and / or irreversible impacts to a factor of high significance are likely.
Extreme	<p>In the absence of project-specific mitigation measures, serious environmental harm will occur/department-wide reputational impacts will occur.</p> <p>A project shall not proceed with an Extreme environmental risk.</p>	<p>Implementation of recommended mitigation measures will not reduce impacts.</p> <p>A project shall not proceed with an Extreme environmental risk.</p>

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