Queensland Transport

Landsborough to Nambour Rail Corridor

Initial Advice Statement

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February 2007

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Executive Summary

Background

The main North Coast Line (NCL), extending from Brisbane to Cairns is unique in Queensland because of the particular mix of traffic it carries and the wide variation in operating characteristics of the rolling stock involved. It serves the needs of commuting trips, longer distance recreational and tourist trips, and industry.

The NCL between Landsborough and Nambour has significant operational and capacity constraints as it is a single track, with passing loops only at stations. This section of the NCL is winding and undulating, which also significantly impacts upon achievable operating speeds. It is within this context that QT is proposing to investigate the upgrading of the NCL between Landsborough and Nambour.

The need to upgrade this section of the North Coast Line has been identified in several planning and policy documents, including the South East Queensland Regional Plan, the TransLink Network Plan, and the Rail Network Strategy for Queensland.

The following objectives from the South East Queensland Regional Plan have been identified as key policy drivers for this upgrade:

- Support Regional Activity Centres such as Nambour with appropriate transport infrastructure;
- Develop a high quality and accessible public transport network linked to regional and sub-regional centres and services;
- Develop and manage strategic road and rail linkages to regional Queensland and other states;
- Identify, protect and manage key existing and future transport sites and corridors; and
- Manage and protect the strategic freight network.

The following TransLink objectives have been identified from the TransLink Network plan:

- Improve speed, frequency and reliability of public transport; and
- Deliver public transport infrastructure that will attract and cater for growth in the South East Queensland region.

The Rail Network Strategy for Queensland policy document identifies the following objectives to develop a rail network that is:

- Safe (for operators, users and the public);
- That is ecologically sustainable (provides net benefits to the environment); and
- Financially responsible (prudent, informed and responsible investment decisions).

The decision to protect a high quality railway corridor that allows for up to four rail tracks and associated infrastructure and earthworks has been made for this project. A similar standard has been established for the adjoining Caboolture to Landsborough rail upgrade. This is to allow for future flexibility for additional tracks to be developed within the corridor, mitigating the need to acquire additional land in the future. This is a long term planning decision, to allow for a greater level of certainty in the longer term development of land use surrounding the corridor. It should also provide landowners affected by the corridor greater certainty about the future land requirements for the corridor.

A scoping study examining the feasibility of upgrading this section of the NCL, has been conducted by Queensland Transport (QT) prior to commencing more detailed investigations. This preliminary scoping study demonstrated that upgrading exclusively along the existing corridor is unlikely to achieve the project objective outlined above. One of the key recommendations of the preliminary scoping study was that further detailed environmental assessment be undertaken, preferably

pursuant to Part 4 of the *State Development and Public Works Organisation Act 1971* (SDPWO Act).

QT is therefore seeking the declaration of the future upgrade of the NCL between Landsborough and Nambour by the Coordinator-General as a "significant project" requiring an Environmental Impact Statement (EIS) under s26(1)(a) of the SDPWO Act.

The project is the upgrade of the NCL between Landsborough and Nambour. This involves the provision of additional tracks and associated infrastructure. The project will require the identification and assessment of corridor options and the selection of a preferred option. This includes preliminary design, stakeholder engagement, and the preparation of an Environmental Impact Statement.

Existing Conditions

The study area for the project is located within the local government areas of Caloundra City and Maroochy Shire. The area is constrained for the provision of rail infrastructure by its topography, and also encompasses numerous areas of environmental significance, including National Parks, Conservation Reserves and Forest Reserves. Numerous creeks traverse the study area, generally in an east-west direction.

Several railway townships are located within the study area, containing residential, commercial and community facilities.

Potential Impacts and Mitigation Measures

The project is likely to have significant impacts on the natural, social and economic environments. These will include both positive and negative impacts. Steps will be taken to mitigate the negative impacts and maximise the positive impacts.

Environmental Management

Management of environmental issues during planning, design and construction will be a significant driver for this project. A Draft Environmental Management Plan (EMP) will be developed during the EIS and will cover a range of aspects related to design, construction and maintenance of the project.

1 Introduction

1.1 Background

The *South East Queensland Regional Plan 2005-2026* (SEQ Regional Plan) identifies an integrated transport system throughout South East Queensland (SEQ) as a "desired regional outcome" with rail playing a key role in achieving this strategic outcome. Therefore, in light of the sustained growth in the region, it is not only prudent, but necessary, to identify and preserve suitable corridors for future rail infrastructure. The section of the North Coast Line (NCL) between Landsborough and Nambour has been identified in the Regional Plan as one such corridor in need of further investigation.

The main NCL extending from Brisbane to Cairns is unique in Queensland because of the particular mix of traffic it carries and the wide variation in operating characteristics of the rolling stock involved. It serves the needs of commuting trips, longer distance recreational and tourist trips, and industry.

Forecast increases in the Sunshine Coast population are expected to increase the demand for travel as is the general increase in tourism. Increases in demand for rail freight are likely as a result of growth at the Port of Brisbane and increases in container freight. Such increases promise to significantly challenge the ability of the infrastructure to support an acceptable level of rail service in the future. Presently, the ability to provide additional services on the NCL south of Nambour is limited by long sections of winding single track, restricted speed operations and congestion due to competing passenger and freight demands. Furthermore, continuing urban growth pressures in SEQ have the potential to compromise or limit the opportunities to construct the necessary infrastructure to efficiently support growth in the longer term.

The following objectives from the South East Queensland Regional Plan have been identified as key policy drivers for this upgrade:

- Support Regional Activity Centres such as Nambour with appropriate transport infrastructure;
- Develop a high quality and accessible public transport network linked to regional and sub-regional centres and services;
- Develop and manage strategic road and rail linkages to regional Queensland and other states;
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has been established for the adjoining Caboolture to Landsborough rail upgrade. This is to allow for future flexibility for additional tracks to be developed within the corridor, mitigating the need to acquire additional land in the future. This is a long term planning decision, to allow for a greater level of certainty in the longer term development of land use surrounding the corridor. It should also provide landowners affected by the corridor greater certainty about the future land requirements for the corridor.

A scoping study examining the feasibility of upgrading this section of the NCL, has been conducted by Queensland Transport (QT) prior to commencing more detailed investigations. One of the key recommendations of this scoping study was that further detailed environmental assessment be undertaken, preferably pursuant to Part 4 of the *State Development and Public Works Organisation Act 1971* (SDPWO Act).

QT is seeking the declaration of the future upgrade of the NCL between Landsborough and Nambour by the Coordinator-General as a "significant project" requiring an EIS under s26(1)(a) of the SDPWO Act.

The SDPWO Act sets out a process requiring the proponent to prepare an EIS for a declared "significant project". This process includes:

- Preparation and public notification of a draft Terms of Reference (TOR);
- Public notification of the EIS, which must address the finalised Terms of Reference;
- Review and response to public submissions through preparation of a Supplementary Report (as required); and
- Reporting on the evaluation of the EIS, public submissions and additional information by the Coordinator-General.

1.2 The Proponent

Queensland Transport (QT) is the proponent for the upgrade of the NCL between Landsborough and Nambour. QT is responsible for developing and managing the land, air and sea transport environment in Queensland. Contact details of the proponent are as follows:

The Manager (Rail Studies)

Queensland Transport, Rail Ports and Freight Division

Physical Address	Postal Address	Phone and Fax
Level 11, 85 George Street	GPO Box 1549	Ph: (07) 3306 7448
Brisbane Qld 4000	Brisbane, Qld	Fax: (07) 3306 7455

1.3 Purpose of the IAS Document

This IAS has been prepared to serve three principle purposes:

- To assist the Coordinator-General to make a decision on 'significant project' declaration;
- To enable stakeholders to determine the nature and level of their interest in the proposal; and
- To assist in the preparation of a draft Terms of Reference (ToR) for an EIS for the proposed project.

This IAS is a scoping document rather than an in-depth analysis of the proposal and as such, lengthy and overly technical discussion has been avoided. Sufficient information has been provided to allow Advisory Agencies and other stakeholders to determine their input into the preparation of comprehensive final ToR for the EIS.

1.4 Environmental Assessment and Approval Process

It is proposed that the EIS for this project be conducted under the requirements of Part 4 of the SDPWO Act. . This process allows for community and advisory agency comment on both the draft ToR for the EIS and the EIS, and is accredited under the bilateral agreement between the Australian and Queensland Governments.

It is considered that several matters of 'National Environmental Significance' (NES) under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) may be impacted by this project. Therefore prior to the issue of the draft ToR, the project will be referred to the Commonwealth Department of the Environment and Water Resources for a decision to be made as to whether the activity is a 'controlled action' under the EPBC Act and the level of assessment required. The NES matters will relate principally to potential impacts on rare, endangered or of-concern plant or animal species or communities and/or regional eco-systems.

The study area contains several National Parks, and a conservation reserve. These are protected under the Queensland *Nature Conservation Act 1992* and also subject to the South East Queensland Regional Forestry Agreement. Vegetation classified as of concern or endangered regional ecosystems, which are protected by the Queensland *Vegetation Management Act 1999*.

The flow chart shown in **Figure 1** provides indicative timeframes for EIS process.

1.5 Stakeholder Engagement

Feedback from the community is an important part of the process and is inextricably linked with the decision processes on this project. Therefore a collaborative approach to corridor identification and assessment is required, involving the local community, local government, State Government, Australian Government, interest groups and other regional community members. Given the likely property implications and potential impact to railway townships along the corridor, the community will be invited to actively provide input.

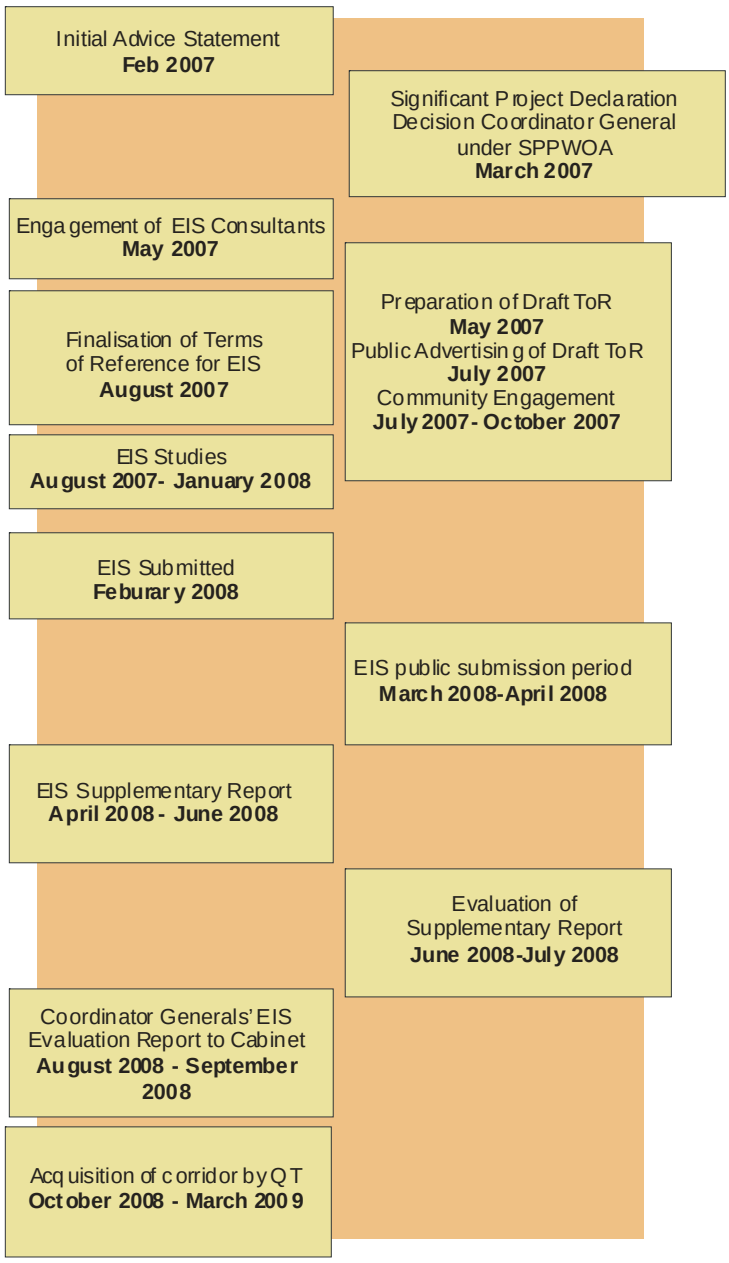

Figure 1: Indicative EIS Process

2 The Proposal

2.1 Location

The study area defined for the future upgrade of the North Coast Line between Landsborough and Nambour is approximately 6km wide, extending approximately 22km from Landsborough to Nambour. The study area is shown in **Figure 2**. This area is considered to provide a realistic area within which the project may take place.

The study area is located within the Commonwealth Government areas of Longman, Fisher and Fairfax, the State Government districts of Glass House and Nicklin and local government areas of Caloundra City and Maroochy Shire.

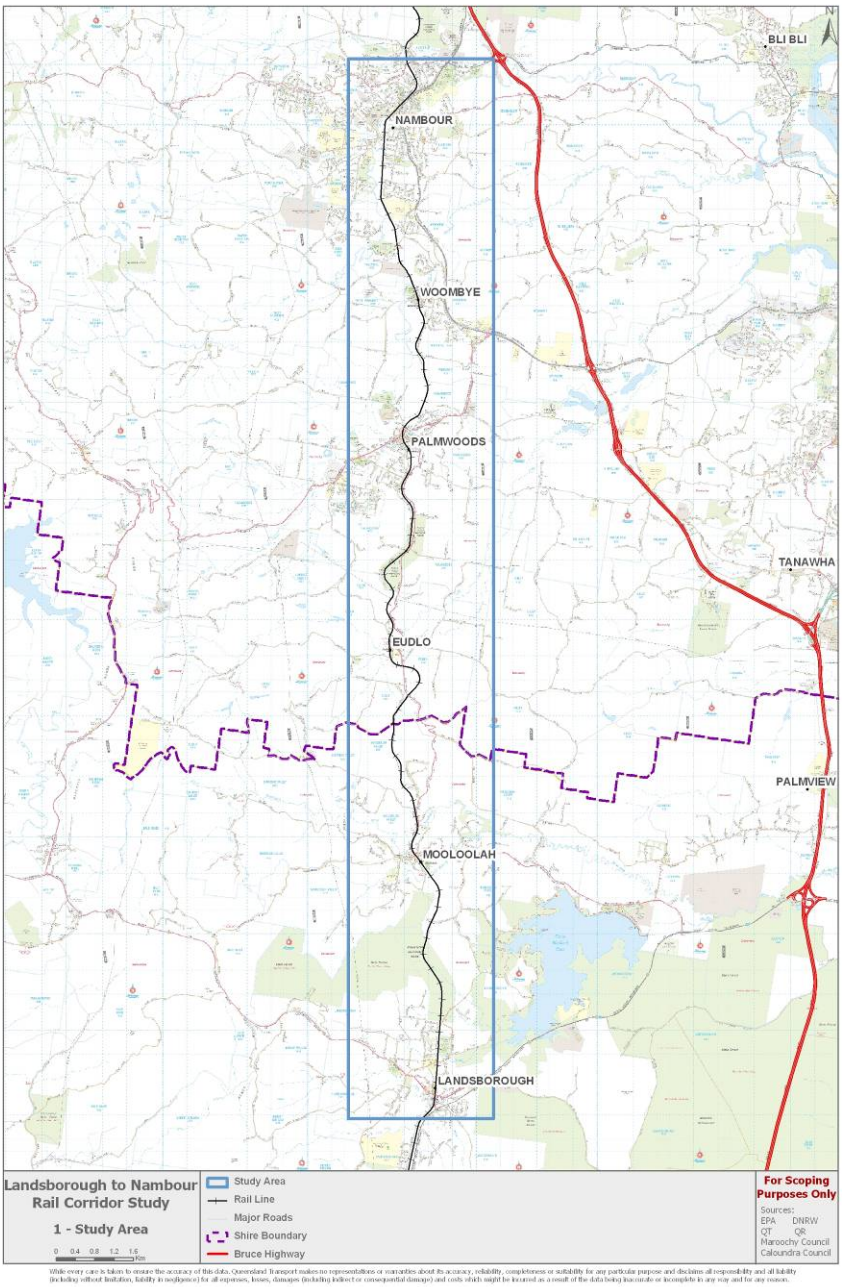

Figure 2: The study area

2.2 Elements, Activities and Infrastructure that Constitute the Project

The project is the upgrade of the NCL between Landsborough and Nambour. This involves the provision of additional tracks, as the NCL is currently single track. A preliminary scoping study shows that upgrading exclusively along the existing corridor is unlikely to achieve the project objectives, as outlined in section 1.1 of this IAS.

The project will require the investigation and assessment of corridor options and the selection of a preferred option within the study area indicated in Figure 1. This investigation will determine the exact nature of the upgrade and a detailed staging and implementation plan for the corridor. The planning of this project will also consider the long-term requirements of the infrastructure beyond the 2026 timeframe of the SEQ Regional Plan.

The following activities are likely to be carried out during the planning stages of the project:

- Referral of the project to the Commonwealth Department of Environment and Water Resources;
- Preparation of an EIS and supplementary documentation in accordance with the requirements of Part 4 of the SDPWO Act (and Commonwealth EPBC Act, if relevant);
- Preliminary design and evaluation of options;
- Corridor selection; and
- Community engagement.

Ongoing tasks following the initial planning phase are likely to include:

- Corridor acquisition
- Detailed design and;
- Construction;

2.3 Project Justification and Alternatives Considered

2.3.1 Project Justification

Forecast population growth in the Sunshine Coast area is expected to increase the demand for travel, along with the general increase in tourism throughout the area. Furthermore, increases in demand for rail freight are likely as a result of growth at the Port of Brisbane and increases in container freight. Such increases are anticipated to significantly challenge the ability of the existing infrastructure to support an acceptable level of rail service in the future.

The SEQ Regional Plan identifies “the need to ensure planning decisions made today do not compromise options to meet longer-term regional needs”, thus emphasising the importance of protecting strategic corridors for future transport and other needs.

Other factors potentially influencing the decision to upgrade this section of the North Coast Line include:

- Compatibility with other future rail links and public transport corridors within the region (e.g. CAMCOS);
- Compatibility with current and proposed future upgrades of the NCL including the Caboolture to Beerburrum and Beerburrum to Landsborough upgrades;
- Longer term (i.e. beyond 2026) land use and planning outcomes; and
- Improved safety of the rail corridor, stations and interface with road network.

The existing NCL between Landsborough and Nambour has significant operational and capacity constraints as it is a single track, with passing loops only at stations. Delays are encountered where some services must wait in passing loops to allow passage of express

services or to allow other services to pass in the opposing direction. Between Landsborough and Nambour, the NCL is winding and undulating, which significantly impacts upon achievable operating speeds, with some services travelling at less than 60km/hr for long sections of the track. The majority of platforms within this section of the NCL are less than 150m in length, and stations are not currently *Disability Discrimination Act* (DDA) compliant.

The current maximum freight train length on this section of the NCL is restricted to the length of the passing loops. The shortest passing loop for this section between Landsborough and Nambour is at Palmwoods at approximately 680m. The duplication of the NCL line in total from Caboolture to Nambour could assist in the future operation of longer trains, which are being investigated.

Rail alignments such as this section between Landsborough and Nambour are generally considered to have higher maintenance and operational costs as compared with a consistent speed alignment.

The current alignment has two Open Level Crossings (OLC) locations between Landsborough and Nambour (plus one to the south of Landsborough), one occupational crossing (north of Palmwoods) and pedestrian crossings at Palmwoods and Woombye. These crossings can cause delays for the operation of the railway as well as safety concerns. The occupational crossing is used by multiple landowners, and presents a significant safety concern to Queensland Rail (QR) due to the lack of accountability.

The need to upgrade this section of the NCL has been identified in several planning and policy documents, including the *SEQ Regional Plan 2005-2026*, the *SEQ Infrastructure Plan and Program 2005-2026*, the *Draft TransLink Network Plan 2005*, and the *Rail Network Strategy for Queensland 2001-2011*.

2.3.2 Alternatives

Alternative options have been considered by QT as a component of prudent transport planning. The two main alternative options are the “do nothing” option and the “upgrade existing” option. Ramifications of both alternative options may include, but are not limited to, the following:

- Increased congestion on the NCL;
- Increased private traffic on the Bruce Highway;
- Increased freight traffic on the Bruce Highway;
- Increased maintenance costs of the Bruce Highway;
- Increased requirement for upgrades of the Bruce Highway;
- Lost opportunities to develop Transit Oriented Developments within the study area; and/or
- Potential requirement to identify an offline corridor at a later date, when property acquisition cost and complexities may be greater.

2.3.2.1 “Do nothing” Option

It is likely that the region would experience adverse socio-economic effects should the NCL between Landsborough and Nambour not be upgraded. Increases in demand are likely to significantly challenge the ability of the current infrastructure to support an acceptable level of rail service in the future.

2.3.3 Upgrade Existing Option

Due to the nature of the current corridor, the potential improvements from upgrades to the existing infrastructure are limited. This option is considered to be a short term, high impact solution compromising options to meet longer-term regional needs.

2.4 Construction and Operational Processes

A variety of construction methods may be applied for the project. These methods would vary depending on the final corridor and design and may include:

- Online construction parallel to existing operational tracks. This may impact on rail schedules, limit working hours for construction, and is generally considered to be a more complex process than offline or 'greenfield' construction.
- Offline or 'greenfield' construction, within a new rail corridor. Construction activities are not constrained by the need to maintain rail services.
- Tunnelling, which may require boring, blasting or other excavation, subject to ground conditions.

The project would then operate as part of the NCL, providing additional capacity to the region.

2.5 Hazard, Risk and Health and Safety

The upgrade of the NCL between Landsborough and Nambour presents a number of potential hazards, risks and health and safety issues. The project may provide health and safety benefits through the improvement of track alignment, potential for the separation of passenger and freight service, provision of safe access and maintenance tracks, potential for the closure of open level crossings, and provision of improved station facilities. If the rail service is perceived as fast, frequent and reliable, and provides a realistic alternative to the private car, the proportion of walk up passengers and cyclists may increase. This however is inherently linked with land use and the investigation of future transit oriented developments may also assist in encouraging health benefits.

2.6 Infrastructure Requirements

The construction of the NCL between Landsborough and Nambour may include the following activities and deployment of infrastructure:

- Clearing of vegetation;
- Additional Rail lines;
- New electricity supply or upgraded supply, including provision for substation/s;
- Railway stations;
- Pedestrian access to stations and across the rail corridor;
- Passing loops;
- Bridges;
- Fauna underpasses;
- Tunnels;
- Road realignments;
- Utility provision and/or relocation (including water, sewage, gas and telecommunications); and
- Decommissioning of obsolete rail line and stations.

The extent and nature of these works will vary with the route and design. Consequently the impacts of this infrastructure will vary. It is anticipated that these impacts will be significant at a local scale. There will be both positive impacts, such as the increase in transport provision, increase in employment, increase in safety and potential for urban regeneration, and negative, such as property acquisition. These impacts are discussed further in Section 4.

2.7 Economic Indicators

There are a number of potential economic benefits of the project both during construction and operation including:

- Job creation during construction and operation (refer **Section 2.8**);
- Increased freight efficiency and use;
- Increased revenue to QT through increased passenger and freight use;
- Increased exports as a link to the Port of Brisbane;
- Revitalisation of local rail-township economies;
- Delayed road infrastructure investment;
- Increased growth potential for the Nambour Major Development Area (MDA) and other railway townships along the corridor, supporting the SEQ Regional Plan desired regional outcomes;

The commissioning of the CAMCOS corridor from Beerwah to Maroochydore may also lead to increased attractiveness for people to live in the railway townships along this section of the NCL and work on the Sunshine Coast, and vice versa.

2.8 Employment During Construction and Operation

A project of this magnitude will lead to the creation of jobs both during construction and operation. The exact workforce numbers and their source will be determined once a construction methodology has been finalised and would be quantified as far as possible in the EIS. It is anticipated that given the scale of the project there will be a need to source employees from both local and regional areas and that during the course of construction some on-site or nearby accommodation will be required.

Based on projections from the current *South East Queensland Infrastructure Plan and Program 2005-2026* (SEQIPP) budget for this project, this project is likely to generate in the order of 4,600 person years of employment. This estimate includes planning, design, construction and associated activities in the lead up to commissioning.

2.9 Proposed Timeframes for the Project

The upgrade of the Landsborough to Nambour section of the North Coast Line is identified in the *SEQIPP 2005-2026 Part B Infrastructure Priorities and Projects*. **Figure 3** indicates the likely timing of a number of related commenced or projected Sunshine Coast rail upgrades. It is anticipated that construction of the Landsborough to Nambour section of the NCL would be complete by 2020.

A preliminary indicative timeframe for the project, assuming it will be declared as a 'significant project' under the SDPWO Act is shown below. This timeframe is based on the flowchart included as **Figure 1** and includes:

- EIS/ assessment (including preliminary design, and stakeholder engagement): complete by August 2008
- Land Acquisition: complete by early-mid 2009..
- Detailed engineering design: should occur between 2010 and 2014. Design elements would include earthworks and trackworks, tunnels, bridges, stations, road relocation, mitigatory and compensatory elements (eg noise treatments), and utilities relocation.
- Construction commences: approx 2015-16

Figure 3: phase 1-4 of Sunshine Coast Rail upgrades (source, Caboolture to Landsborough rail upgrade newsletter, 2006)

2.10 Financing Requirements and Implications

The SEQIPP identifies a budget allocation of $550 million for the project. These costs are indicative only and will require significant refinement as part of the EIS when more detailed investigations and consultation is undertaken. Elements contributing to this cost are likely to include (but not be limited to):

- Study costs (EIS, ground survey, preliminary design, detailed design);
- Land acquisition costs and compensation;
- Other necessary compensatory or mitigatory measures; and
- Construction costs (earthworks, trackwork, signalling and electrification, possible substations, stations and station facility upgrades, road relocations, relocation of utilities, tunnels, bridges, culverts, noise treatments, visual treatments and landscaping).

2.11 Potential EIS Studies

Investigations completed to date have been largely desktop. More detailed investigations and stakeholder engagement will be carried out as part of the corridor identification and EIS process. The studies required to complete the EIS (i.e. environmental, economic, social, engineering) may include, but are not limited to:

- Cost-benefit analysis;
- Railway operational analysis;
- Traffic impact assessment of the upgrade to the local rail network;
- Detailed ecological investigations;
- Flood modelling;
- Consideration of land use and settlement patterns up to and beyond 2026;
- Consideration of the economic, social and land use implications of the relocation, removal or alteration of stations upon the railway townships along this section of the NCL.

3 Existing Environment

3.1 Natural

3.1.1 Terrain

The Blackall Range runs parallel to the study area to the west. At a number of points, east-west running ridges dissect the study area, most noticeably between Landsborough and Mooloolah and between Mooloolah and Eudlo. Numerous smaller ridges and steep slopes traverse the study area. Areas of steep slope gradient and instability are generally not suitable for the development of rail corridors given design and cost implications.

3.1.2 National Parks and Reserve Systems

Within the study area, four protected areas have been identified. Collectively, they make up approximately 8% of the study area. These are listed in **Table 3.1.2** below.

Table 3.1.2: Protected areas

Name	Status
Dularcha National Park Eudlo Creek National Park	These are listed under the *Nature Conservation (Protected Areas) Regulations 1994*.
Mooloolah Forest Reserve (located to the west of Dularcha National Park)	Forest Reserves will be converted to National Park classification under the *Nature Conservation Act 1994*. The *South East Queensland Forestry Agreement 1999* will formalise and document this change.
Mooloolah (Marie Higgs) Conservation Park	Protected Estate under the *Nature Conservation Act 1994*.

3.1.3 Areas of Ecological Significance

Approximately 228 ha of 'Endangered' Regional Ecosystems (RE) and 936 ha of 'Of Concern' Regional Ecosystems (RE) has been mapped in the study area. Approximately 552 hectares of National Park, Forest Reserve or Conservation Park are located within the study area. The RE designations are also largely coincident with the protected tenures (i.e. National Parks). **Appendix A** lists the types of Regional Ecosystems present within the study area.

3.1.4 Protected Species

The Department of the Environment and Water Resources Protected Matters Tool Database lists matters of national environmental significance and other matters protected by the EPBC Act. The following has been noted as potentially occurring within the study area:

- 25 Threatened Species (Matter of National Environmental Significance);
- 10 Migratory Species (Matter of National Environmental Significance); and
- 14 Listed Marine Species (protected by the EPBC Act).

Appendix B lists significant species, listed under the EPBC Act or the *Queensland Nature Conservation Act 1992* potentially present as highlighted in the Environmental Protection Agency Wildlife on-line web search.

3.1.5 Watercourses and Aquatic Habitats

The following named watercourses pass through the study area (listed south to north):

- Mellum Creek (Pumicestone Passage Catchment);
- Addlington Creek (Flows into Ewen Maddock Dam – tributary of Mooloolah River);

- South Mooloolah River *(tributary of Mooloolah River);*
- Mooloolah River;
- Acrobat Creek *(tributary of Eudlo Creek);*
- Eudlo Creek *(tributary of the Maroochy River);*
- Paynter Creek *(tributary of the Maroochy River); and*
- Petrie Creek *(tributary of the Maroochy River).*

Generally, riparian vegetation is associated with these watercourses, which also provide habitat connectivity from the east to the west.

Many of these waterways are significant from an ecological, recreational and visual perspective.

The Mooloolah River system is considered to provide habitat for a diverse range of flora and fauna, according to the Ecosystem Health Monitoring Program (http://www.healthywaterways.org Accessed October 2006).

It should also be noted that the mouth of the Maroochy River which Eudlo, Paynter and Petrie Creek flow into is a Fish Habitat Area.

3.1.6 Geology, Topography and Soils

The geology of the study area consists largely of Landsborough Sandstone and sedimentary sandstones. Alluvial soils are expected to be encountered around the watercourses in the study area. There is a small area of potential acid sulfate soils in the north east of the study area on the flood plains of Petrie and Tuckers Creeks.

3.1.7 Air and Noise

The Environmental Protection Agency as part of its ongoing air quality monitoring has a monitoring station at Mountain Creek (Mountain Creek Primary School, Maroochy Shire) which records Ozone, PM_{10} (Particulates), nitrogen oxide and meteorological conditions.

Although it is approximately 13 kilometres from the study area, it is the closest air quality monitoring station and provides a useful indicative assessment of the regional air quality in the study area. A review of the air quality monitoring data[1] on the 12th October 2006 showed that all indicators were classified as 'very good'.

In addition to the data available from the Mountain Creek station, the National Pollutant Inventory (NPI) database was reviewed for relevant pollutant emission information . Results for the local government areas of Caloundra and Maroochy provide an indication of pollutant emissions in the study area.

Within Caloundra City, data from industrial facilities and diffuse sources for the 2004-2005 reporting year identified motor vehicles as the top source of emissions followed by manufacturing, architectural surface coatings, domestic / commercial solvents / aerosols, lawn mowing and others. Of the twelve facilities listed within Caloundra City that reported to the NPI, only one facility was located within or nearby the study area. Rankings for the top substance emissions from this facility were low.

Data recorded for the local government area of Maroochy for the 2004-2005 reporting year also identified motor vehicles as the top source of pollutants, followed by architectural surface coatings, airplanes, domestic / commercial solvents / aerosols, public order and safety services and others. Twenty facilities reported to the NPI with the majority of those being located along the coastal zone. Five of these industrial facilities are located either within or in proximity to the study area. All five industrial facilities identified in the study area ranked low levels of emissions.

1 www.epa.qld.gov.au/projects/air

Environmental factors such as physical landform, geology and soil types, hydrology and meteorology influence the air quality in the region. The Landsborough to Nambour corridor is within an area characterised by a subtropical climate with very humid and very warm summers and mild and dry winters. Average annual meteorological conditions have been noted based on a review of data from the Nambour Department of Primary Industries (DPI) which is the closest station to the study area.

The main air pollutant source identified within the study area is motor vehicles. Potential pollutants may include: Carbon Monoxide (CO), Nitrogen Oxide (NOx), particulate matter and Hydrocarbons.

Currently both diesel and electric rolling rail stock use the Landsborough to Nambour corridor. Electric trains provide significant air quality and environmental benefits in the area of use whereas diesel-powered locomotives contribute to atmospheric emissions along railway corridors.

Road traffic noise is considered to be a significant noise generator, particularly in the Woombye and Nambour town centre areas. The operation of the existing NCL also contributes to the local noise profile. The queuing of freight and other services in passing loops (which are generally located near stations/ in town centres) waiting for other services to clear the line also contributes to the local noise profile.

Environmental values that may be affected by noise relating to the operation and construction of railway within the Landsborough to Nambour study area are largely associated with dwellings and places of community interest i.e. sensitive receptors. These are generally clustered within and around the railway townships.

3.2 Social and Economic Aspects

3.2.1 Social Aspects

Since the construction of the railway, the towns within the study area have been influenced or have been stimulated by its presence. These include Landsborough, Mooloolah, Eudlo, Palmwoods, Woombye and Nambour. The majority of households in the study area are clustered around existing railway stations and their associated villages and towns, however a number of new rural residential developments are emerging in the areas surrounding these railway towns.

The populations of the different postcode areas from the 2001 census are presented in **Table 3.2.1**. These represent areas including persons outside of the study area defined in **Figure 1**.

Table 3.2.1: Population data for the study area

Area	Population (ABS Census data 2001)
Landsborough	4121
Mooloolah	3822
Eudlo	1793
Palmwoods	3987
Woombye	3377
Nambour	27296

It is anticipated that community consultation will further assist in the identification of socially important areas to local residents, community groups and other stakeholders.

3.2.2 Community and Tourist Facilities

A number of community and tourist facilities have been identified in the study area. These include (but are not limited to) those listed below in **Table 3.2.2**.

Table 3.2.2: Community and Tourist Facilities

Township	Facility
Landsborough	Caravan Park(s), Hotel(s)/Lodge(s), Restaurant(s), Arts Centre(s), Market(s), Ewen Maddock Dam Recreation Centre, shops, businesses, professional services, offices, post office, local businesses Landsborough Recreation Reserve and Sports and Recreation Club Vidler Park, RSL Park, CWA Park, Peace Memorial Park Landsborough Museum Schools
Mooloolah Valley	Mooloolah Valley Riding Centre Suzen Court Park, Martin Rungert Park, Village Green, South River Park Mooloolah Recreation Ground Marie Higgins Conservation Park Mooloolah Fire Station Mooloolah Pony Club Schools
Eudlo	Eudlo Skate Park Tennis Association Horse and Pony school Public hall and recreation grounds Eudlo Primary School
Palmwoods	Hotel(s), bowls club, markets, community pool Kolora Park, Police station, Rifle Range, Showgrounds Jubilee Park, Briggs Park, Federation Park Religious buildings Nambour Cricket Club State School
Woombye	Nursery, Fun Park, Pub Paynter Park, Memorial Park, CWA Park, Junee Crescent park, Showgrounds, community library, Masonic centre Junee Crescent Park, McCarthy Drive Park Residential Care and Community Aged Care Horse and Pony Club Soccer Club Religious buildings Schools
Nambour	Hotel(s), Restaurant(s), Tennis Complex Horse and Pony Club, Showgrounds, RSL, Civic Centre, Shop(s), Library, Shopping Centre(s) Moss Day Park, Huntingdale Park, Jubilee Park Sports clubs and facilities, Health services Koala park Religious buildings Schools(s), College

3.2.3 Landscape and Visual Character

The landscape of the study area generally consists of settlement areas (Landsborough, Mooloolah, Eudlo, Palmwoods, Woombye and Nambour), National Parks, forested and other vegetated areas and agricultural land.

In terms of topography, the study area has a mix of relatively high, steep undulating land and lower floodplain areas linked to Addlington Creek, South Mooloolah River, Mooloolah River, Eudlo Creek, Acrobat Creek, Paynter Creek and Petrie Creek.

The anticipated landscape value of areas within South East Queensland is reflected in the Scenic Amenity maps produced for the *South East Queensland Regional Scenic Amenity Study 2004*. This study used survey data of scenic preference and visual exposure to predict the scenic value of sites in South-East Queensland.

According to the Scenic Amenity maps (*SEQ Regional Scenic Amenity Study 2004*), large sections within the study area are considered to have a high scenic amenity profile. These areas are generally located in the areas between the railway townships along the existing rail corridor.

3.2.4 Cultural Heritage and Native Title

Desktop research has revealed a number of heritage items of cultural and historic importance within the study area. It is expected that further research may identify a number of additional sites, in particular those of indigenous significance.

A search of the Native Title Tribunal registers has not been undertaken at this phase of the study. It is understood that there are active claims registered in the study area. It is understood that these groups are of relevance to the area: Gubbi Gubbi People No.2; Kabi Kabi and Jinibara People.

3.2.5 Economic Characterisation

The study area traverses two local government areas, Caloundra City and Maroochy Shire. The six townships included in the study area are, south to north, Landsborough, Mooloolah, Eudlo, Palmwoods, Woombye, and Nambour. Current employment within the study area covers the following sectors with the majority of economic activity understood as being derived from tourist and agricultural activities:

- Retail;
- Agriculture;
- Quarrying;
- Forestry;
- Educational;
- Health industry;
- Public transport (rail and bus);
- Tourism;
- Craft and artisans;
- Nursery and woodwork businesses;
- Community facilities;
- Trades;
- Labourers and related workers;
- Professionals; and
- Clerical, sales and service workers.

3.3 Built Environment

The built environment of the study area is dominated by the six townships and associated and interconnecting infrastructure.

The breakdown of housing stock in 2001 by location is presented in **Table 3.3**. These figures are for detached houses and units only. Terrace houses, town houses, unoccupied dwellings and caravans make up the majority of the remainder of the housing stock in the various locations at low percentages.

Table 3.3: Housing stock in the study area

Location	Percentage of detached houses	Percentage of units	Other
Landsborough	86%	1%	13%
Mooloolah Valley	90%	0.5%	9.5%
Eudlo	92%	0.5%	7.5%
Palmwoods	83%	2%	15%
Woombye	88%	2%	12%
Nambour	76%	6%	18%

Source: ABS 2001 Census

According to data prepared by the Planning Information and Forecast Unit (Department of Local Government and Planning), housing approvals have slowed in recent years for both Caloundra City and Maroochy Shire. In the last year there has been over a 15% decline in new dwelling approvals in both centres.

Infrastructure in the study area includes transport infrastructure (local and state road network), water, stormwater, sewer, telecommunications and electricity. Of particular note, the REEF fibre optic cable between Brisbane and Cairns is located within the existing rail corridor. It is also understood that the Queensland Government is conducting a study into the identification of a water supply pipeline corridor that traverses the study area. The location of this proposed pipeline is currently unresolved, though consultation with the relevant authorities will be undertaken.

3.4 Land Tenure and Regional Land Use

The majority of the land within the Study Area is freehold. This includes land zoned for rural, rural residential, commercial and residential purposes. There are a number of small reserve areas for open space/conservation scattered throughout the area, predominantly in the vicinity of the townships. These reserve areas are generally located in the vicinity of watercourses and rural residential subdivisions. Between the Landsborough and Mooloolah township areas, the existing rail line traverses the Dularcha National Park. Immediately to the west of the Dularcha National Park, is State Forest Reserve. To the north of Eudlo, the existing rail line traverses Eudlo Creek National Park.

Townships within the study area are located with the 'urban footprint' as designated by the *SEQ Regional Plan 2005-2026*. This classification applies to developed urban land, and also land that could potentially be developed for urban purposes subject to other constraints (i.e. environmental, physical, cultural).

The areas between and around the townships is included in the Regional Landscape and Rural Production Area. This area is generally to be retained for rural activities.

3.5 Complexity of Government Requirements

Local, State and Commonwealth government agencies and authorities are likely to have interest, provide significant input, or control over aspects of this project. Table 3.5 below outlines the potential relevant key legislation that may apply to this project.

Table 3.5: Description of Potentially Relevant Legislation

Title	Relevance
Commonwealth Environment Protection and Biodiversity Conservation Act 1999	Should the future upgrading of the NCL be assessed to potentially have a significant impact on a matter of National Environmental Significance and be declared a controlled action, the environmental assessment processes undertaken will require approval from the Commonwealth Minister of Environment.
Commonwealth Native Title Act 1993	Native title potentially applies to all areas unless it has been extinguished.
Aboriginal and Torres Straight Islander Heritage Protection Act 1984	This act provides protection to places of significance to indigenous people.
State Development and Public Works Organisation Act 1971	This rail upgrade could be declared a 'significant project' which sets the framework for environmental assessment.
Integrated Planning Act 1997	The development of the rail corridor may be carried out under the provisions of Chapter 2 Part 6, Community Infrastructure designation
Environmental Protection Act 1994	General environmental duty Process for Environmental Impact Assessment Notification of Environmentally Relevant Activities Environmental Protection Policies
Nature Conservation Act 1992	Establishes framework for the protection of places and wildlife of conservation significance.
Vegetation Management Act 1999	The study area contains a range of regional ecosystems, some of which are identified as 'endangered' or 'of concern'. This also includes the new classification of 'essential habitat'. Application under the provisions of this act would likely be required for clearance of areas designated as 'endangered' or 'of concern'.
Water Act 2000	Future works requiring the removal of vegetation, excavation or placing fill within the bed and banks of a watercourse, lake or spring or any other water-related development will require approval under this Act.
Land Protection (Pest and Stock Route Management) Act 2002	The identification and management of declared pests within the railway corridor will have to be considered as part of the planning, assessment and construction phases of the project.
Aboriginal Cultural Heritage Act 2003	Must comply with the Duty of Care Process Cultural Heritage Management Plan must be prepared Consultation with the recognised Aboriginal Party under the Act
Queensland Heritage Act 1992	Development of a place entered on the register requires approval from the Heritage council.
Transport Planning and Coordination Act 1994 and the Acquisition of Land Act 1967 (AOLA).	Allows the 'Chief Executive' the power to resume land for the purposes of transport or for an incidental purpose, if in his opinion the land is required for those purposes. The power to acquire property for transport purposes is contained in section 25 of the TPC. Property may be acquired by agreement or by resumption. The power to compulsorily resume property is restricted to the extent specified in the TPC and the *Acquisition of Land Act 1967* (AOLA). The AOLA contains the procedure to be followed. Under section 25(8) of the TPC the chief executives of the Department of Main Roads and the Department of Transport are constructing authorities for the purposes of the acquisition of land for public works in the AOLA.
Transport Infrastructure Act 1994	Allows a 'rail feasibility investigator' to enter private land to investigate the feasibility and suitability of the land for part of a rail corridor.

3.5.1 Local Government

Both Caloundra City and Maroochy Shire Councils have prepared and adopted planning schemes in accordance with the *Integrated Planning Act 1997*.

3.5.1.1 Caloundra City Plan 2004

The *Caloundra City Plan 2004* divides the local government area into 16 Planning Areas. The Planning Areas are broadly based on water catchment and geographical boundaries, including urban and township boundaries. The study area is included in 3 of the Planning Areas, being:

- Landsborough Township Planning Area;
- Mooloolah Township Planning Area; and
- Mooloolah Valley Planning Area.

Each of these Planning Areas are further divided into Precincts. The 'Precincts' replace 'Zones' and 'Designations', which were used in the previous planning scheme The precincts are broadly grouped into Residential, Business and Commercial, Industry, Rural, Emerging Community, Open Space and Community categories.

3.5.1.2 Draft Caloundra City Local Growth Management Strategy

The sequencing strategy identified in the Draft Caloundra City Local Growth Management Strategy (LGMS) has regard to the strategic directions, policies, principles and targets established by the SEQ Regional Plan and the SEQIPP, whilst also taking account of existing development approvals and commitments made in the *Caloundra City Plan 2004* and the intent of the LGMS.

In terms of the sequencing strategy, this available greenfield land within Landsborough and Mooloolah townships is identified for development in the short term, namely 2006 to 2015. In relation to land within the study area, the sequencing strategy does not identify land beyond 2015.

As the LGMS is required to be in line with the SEQ Regional Plan, consultation with the Office of Urban Management (OUM) is required to explore the preferred pattern of development subsequent to 2026.

3.5.1.3 Maroochy Plan 2000

The *Maroochy Plan 2000* comprises the following elements:

- Strategic Plan. The strategic plan describes the vision for the future of the Shire and the Council's strategic policy for achieving the desired future.
- Desired Environmental Outcomes (DEOs). There are seven DEOs included in this scheme. These relate to the issues of: Environmental Management; Social Equity and Liveability; Economic Sustainability; Transport and Accessibility; Community and Cultural Development; Urban Design, Heritage and Character; and Development Infrastructure.
- Planning Areas, Precincts and Precinct Classes. The Shire of Maroochy has been divided into 30 Planning Areas. These Planning Areas have been divided into over 300 Precincts and for easier use, these Precincts have been categorised into 18 Precinct Classes. The study area is included in 5 of the Planning Areas, being:
  - No. 2 – Nambour;
  - No. 14 – Palmwoods;
  - No. 15 – Woombye;
  - No. 21 – Eudlo Creek Valley; and
  - No. 28 – Southern Hinterland.

3.5.1.4 Major Development Area

The Nambour Town Centre, which includes the Nambour Railway Station and interchange, has been declared as a Major Development Area (MDA) by the Office of Urban Management (OUM).

Maroochy Shire Council (MSC) is required to prepare a structure plan for the MDA to address transport and land use integration, among other things. It is expected that the structure plan will have a transit oriented focus.

QT and TransLink are working closely with MSC and OUM to develop an integrated transport and land use solution, although options to relocate the rail station are limited due to the strict alignment standards for rail. Realignment of the rail line to accommodate an alternative station location within the town centre would likely result in significant impacts to the town centre whilst offering no perceived benefits to rail operations.

Determining the location of the Nambour Rail Station and alignment will be resolved separately as part of the structure planning process. It is anticipated that the issues associated with the rail station and alignment will be resolved by mid 2007 to inform the main study.

4 Potential Impacts and Mitigation Measures

The project is likely to have significant impacts on the natural, social and economic environments. These will include both positive and negative impacts. Steps will be taken to mitigate the negative impacts and maximise the positive impacts. An indication of the possible impacts associated with an upgraded offline rail corridor is provided below.

4.1 Corridor Planning Considerations

A number of environmental, social and economic issues have been identified and discussed in **Section 3** of this IAS. Of these issues, the following have been identified as the most significant in determining the preferred corridor alignment:

- Location of protected areas – the location of Dularcha National Park and Eudlo Creek National Park are identified as significant constraints for the development of corridor options. Given the proximity of Dularcha National Park to the southern extent of the project area, there is little opportunity to avoid impacts within this area. There is also a significant area of remnant vegetation which is currently part of the Mooloolah Forest Reserve, covering a significant proportion of the west of the study area. This vegetation, combined with the terrain of the area and existing urban land use constraints, will influence the development of corridor options. Avoiding or mitigating the impact on protected areas such as National Parks will be a requirement when developing any potential rail upgrade options and consultation with the Environmental Protection Agency/ Queensland Parks and Wildlife Service would be essential prior to selection of a preferred option.
- Areas of significant vegetation – a number of areas of significant vegetation (Regional Ecosystems or areas identified as Regional or State Biodiversity Planning Areas) have been identified in the study area. These areas also broadly correlate to areas of steep slope and ridge lines, which are also significant constraints from an engineering perspective for the development of rail infrastructure.

These constraints will be mapped during the development of corridor options. Where it is not possible to avoid these areas entirely, efforts to minimise the impact of corridor options upon these areas will be taken.

Additional factors considered important for corridor option development include:

- Potential for impacts to areas and sites of indigenous or historic cultural heritage significance;
- Location of existing communities and social infrastructure (in terms of noise, air quality, severance, visual amenity);
- Requirements for waterway crossings;
- Impact on recreational areas;
- Costs and constructability of the corridor and associated infrastructure;
- Impacts to wildlife corridors and habitat connectivity;
- The potential for station relocations in the town areas, and
- The potential for land acquisition of private property.

4.2 Natural Environment Impacts

4.2.1 Construction

Flora, Fauna and Aquatic Habitats

The preparation of the EIS and selection of the preferred route will allow potential impacts to flora and fauna to be understood in detail. At this stage of the project it is possible only to

discuss potential impacts in general terms based on the existing environment of the study area.

Direct disturbance to flora and fauna as a result of construction of the project is likely to involve areas currently protected or identified as ecologically significant. As discussed in **Section 4.1** these areas will be avoided wherever possible. Construction areas will be clearly marked and defined and activities will be restricted to these areas. The selection of access roads will also minimise impact on flora and fauna.

Due to the potential nature of the project and number of watercourses in the study area, riparian vegetation and aquatic fauna are likely to be impacted, particularly at locations where bridges or culverts are required. These impacts will be minimised through sensitive planning and design, and an Environmental Management Plan (EMP) will be developed to assist in mitigating impacts.

Water Quality and Sediment Control

The potential for impacts to water quality is considered likely to be highest during the construction phase. Areas exposed from the earthworks phase could potentially contribute a high sediment load to receiving waters, unless mitigated. This effect could generate a range of impacts to aquatic flora and fauna.

Another potential impact to water quality arises from accidental spillages of materials associated with rail construction (eg fuel, lubricants etc). The use of herbicides during site clearing, especially on overgrown creek banks, could potentially have negative impacts on water quality and stream ecology if allowed to enter the waterway. Highest rainfall is likely in summer months, however high rainfall storms are possible all year. Erosion and sediment control measures should be monitored throughout construction irrespective of season and included in the draft EMP (Construction).

Steps will be taken to mitigate such impacts including:

- Sensitive design of bridge crossings and drainage structures,
- Specifying spill containment procedures, and
- Minimise clearing extent and degree of embankment disturbance during earthworks.

Waste Management

It is anticipated that some waste will be generated during construction of the project.

In general terms, waste management relates to:

- The minimisation of waste generated;
- The utilisation of recycled materials;
- The recycling of waste materials; and
- The appropriate disposal of waste.

Consideration of these issues as a hierarchy helps to minimise waste generation and the associated impacts of disposal. This hierarchy will be incorporated into the Environmental Management Plan (EMP) to ensure waste is considered through design, construction and operation.

Air and Noise

Dust is likely to be generated as a result of construction activities and vehicle movements during construction. Consideration of air quality impacts in planning site access and construction activities would allow these impacts to be minimised.

The impact of noise during construction would need to be controlled to acceptable levels in areas likely to impact noise sensitive receptors. Some noise mitigation measures are expected to be appropriate during construction.

4.2.2 Operation

As this is the upgrading of existing infrastructure, operational impacts to the natural environment are not anticipated as being significantly different to those currently managed on this section of the NCL. However, these impacts may be experienced within new areas if a new alignment is selected.

The potential impacts and mitigation measures are discussed below.

Fauna Movement

After construction and commissioning of the project, east-west fauna movement may be restricted due to the proposed increase in width of the rail corridor. If required, any permanent fencing should be fauna friendly, particular around areas that may be acting as a movement corridor and the potential to restrict fish passage under/through bridges/culverts would be considered during design.

Weed Management

There is the potential for the spread of weeds both within the corridor and adjacent to the corridor as a result of the project. This would be controlled through work practices which prevent the establishment (or further promotion) of introduced weed species and weed removal in accordance with appropriate procedures.

Water Quality and Sediment Control

The use of herbicides during maintenance of the rail corridor, especially on creek banks, could potentially have negative impacts on water quality and stream ecology if allowed to enter the waterway.

Application practices of any herbicides would be carefully controlled, with no excess herbicide applied. Herbicides which have been designed to minimise potential water quality and faunal impacts, by degrading rapidly to harmless by-products would be recommended.

Air and Noise

Reasonable and practicable noise reduction considerations and measures are to be incorporated into the location, design and construction of the proposal. e.g. the use of noise barriers, and design to reduce wheel squeal. There is the potential for the design to lead to a reduction in wheel squeal, however it is likely that this project would lead to increase use of the railway. Depending on the preferred route of the project, sensitive noise receptors may experience either a decrease or increase in noise impacts.

Increased train movements may also result in increased dust generation or frequency of dust generation.

4.3 Social and Economic Impacts

4.3.1 Social

Social benefits mainly have the potential to accrue from the project as it is a critical component in the overall strategy of the South East Queensland Regional Plan. Social issues will be addressed as part of the EIS process and include consultation with the community to identify issues, both positive and negative, and the development of appropriate means to address these.

The adverse and beneficial effects of the Corridor need to be considered at both the regional and local context. Regionally, the benefits of the Corridor will include improved rail services for commuters, local residents and long distance passengers, from reduced travel

times and improved service frequency. Other flow on effects, such as reduced dependency on private motor vehicles for people in the station catchments may also accrue from the project.

Adverse effects arising from the project may occur at the local scale. These include localised severance and access alterations, land requirements from private and State owned property, and in some cases, some residences may be directly affected or in closer proximity to the project than they are currently to the existing rail corridor.

Potential regional social impacts are likely to result from the project. That includes potential improvements in rail service travel times and frequency, improved station facilities, improved local road network (where grade separation and access control is possible).

Property Impacts and Severance

Property impacts, including agricultural severance and resumption of private properties are considered an adverse effect at the local scale (some severance and community disruption is likely during construction). Currently, the likely range of property impacts during construction is estimated in the range of 200 properties (+/- 15%).

Cultural Heritage

Cultural heritage can be impacted in two main ways:

- Impact to known indigenous and non-indigenous cultural heritage features, and
- Impact to unknown cultural heritage features encountered during construction.

Detailed cultural heritage investigations and consultation with indigenous and local/historical groups will be necessary as part of the EIS process, to minimise the potential for these impacts. This will include the preparation of a Cultural Heritage Management Plan.

Landscape

There are likely to be both positive and negative impacts to the landscape in relation to:

- Impacts to settlement areas and natural and artificial landscape features, and
- Potential to improve the landscape in areas currently degraded as part of the project.

4.3.2 Economic

A detailed cost-benefit analysis will need to be undertaken as part of the EIS process.

The project is expected to provide benefits to the regional community economy, particularly during the construction program. It is anticipated that the workforce will primarily be derived from local and regional sources depending on the nature of the skills required.

It is anticipated that the project may negatively impact directly affected local businesses. Landholders who suffer direct loss of land will be compensated in accordance with current legislation. In the longer term, it is anticipated there will be economic benefits through the improvement of the accessibility of the railway townships and associated ability for greater increases in tourist numbers. Additionally, there will be potential for regeneration and consolidation around the upgraded stations including the potential for planning of future Transit Oriented Developments (TOD).

4.4 Built Environment

As previously noted, the railway townships have a strong historic association with the railway stations along the study area. The decision on a corridor, and subsequent impacts to townships may range from railway stations being moved or removed from their current location, or altered to accommodate the rail corridor.

There is the potential for TOD, or increased building densities to be considered within the townships along this corridor, particularly in the vicinity of existing or future station locations. This is a concept that is already being examined by Maroochy Shire Council and the Office of Urban Management within Nambour township as part of the structure planning process. Corridor planning may also assist to identify other locations where TOD style development may be appropriate.

There is the potential for improved rail services to attract residents to these railway towns and surrounds, encouraging subsequent growth in local services and industries. There is also the potential for the future rail connection between Beerwah to Maroochydore to further contribute to the attractiveness of these railway towns.

4.5 Potential Environmental and Health Benefits of Increased Public Transport Availability

An analysis of the environmental benefits of increased public transport availability within the study area has not been conducted. However the following assumptions could be considered:

- Improved rail services can reduce dependency on private motor vehicles (reduced greenhouse emissions, reduced need for additional road and highway capacity);
- Perceived improvements to public transport infrastructure (i.e. speed, frequency, reliability) can lead to a change in the perception of the attractiveness of public transport and lead to an increase in demand; and
- Potential improvements to the rail network could improve the competitiveness of rail freight, which may result in a shift from moving goods via road freight. However, it is recognised that there are a multitude of other factors that influence freight mode choice.
- There is a potential to attribute health benefits to the provision of improved rail services. If the rail service is perceived as fast, frequent and reliable, and provides a realistic alternative to the private car, the proportion of walk up passengers and cyclists may increase. This however is inherently linked with land use and the investigation of future transit oriented developments may also assist in encouraging health benefits.

5 Environmental Management

An Environmental Management Plan (EMP) will be developed during the EIS and will cover a range of aspects related to design, construction, operation and maintenance of the project. An EMP is a tool to help meet the requirements of applicable environmental legislation, achieve best practice environmental management, and to aid in achieving the environmental requirements of relevant authorities for the works. It is a written description of proposed measures to be implemented to manage the impacts of the project on the environment. The EMP would be reviewed and periodically updated to reflect knowledge gained during the course of the project.

The EMP would address:

- Design Requirements
- Pre-construction activities
- Construction/ commissioning
- Operation
- Closure/ final rehabilitation

6 References and Data Sources

6.1 Sources

- Landsborough to Nambour Scoping Study Report 2006 (Arup) for Queensland Transport
- Michell and Laird (2002) *Smooth running study*
- *City Plan 2004 (Caloundra City Counci)l*
- Maroochy Plan 2000 (Maroochy Shire Council)
- Australian Bureau of Statistics 2001 Census data
- *South East Queensland Regional Plan 2005-2026*
- *South East Queensland Infrastructure Plan and Program 2005-2026*
- *Draft TransLink Network Plan 2005*
- *Rail Network Strategy for Queensland 2001-2011*.
- PIFU Planning Sheets (Caloundra and Maroochy)

Appendix A

Regional Ecosystems present within the study area

Regional Ecosystems within the study area

(Source: 2003 remnant regional ecosystem Version 5 prepared by Queensland Herbarium)

RE	VM Act Status	Biodiversity Status	Vegetation Description
12.3.1	Endangered	Endangered	Complex to simple notophyll vine forest. *Waterhousea floribunda* is predominant fringing stream channels. Other species can include *Cryptocarya hypospodia*, *C. obovata, C. triplinervis, Argyrodendron trifoliolatum, Ficus coronata, F. fraseri, F. macrophylla, Aphananthe philippinensis, Elaeocarpus grandis, Grevillea robusta, Castanospermum australe* and *Syzygium francisii. Ficus racemosa* and *Nauclea orientalis* in north of bioregion. Eucalyptus emergents (e.g. *E. grandis*) and *Araucaria cunninghamii*; less commonly Agathis *robusta* may also be present. Occurs on Quaternary alluvial plains and channels.
12.5.3	Endangered	Endangered	*Eucalyptus tindaliae* and/or *E. racemosa* open-forest with *Corymbia intermedia*, *E. siderophloia* ± *E. resinifera, E. pilularis, E. microcorys, Angophora leiocarpa* on complex of remnant Tertiary surfaces ± Cainozoic to Proterozoic sediments. Melaleuca quinquenervia often a prominent feature of lower slopes. Minor patches (<1ha) dominated by *Corymbia citriodora* can sometimes occur. Occurs on complex of remnant Tertiary surfaces ± Cainozoic to Proterozoic sediments.
12.9-10.16	Endangered	Endangered	Microphyll to notophyll vine forest ± *Araucaria cunninghamii*. Characteristic species include *Argyrodendron sp*. (Kin Kin W.D. Francis AQ 81198), *Araucaria cunninghamii*, *Agathis robusta, Backhousia myrtifolia, Cupaniopsis parvifolia, Dendrocnide photinophylla, Rhodosphaera rhodanthema, Flindersia australis, F. xanthoxyla, Drypetes deplanchei, Olea paniculata, Diospyros geminata, Austromyrtus bidwillii, Excoecaria dallachyana* and *Vitex lignum-vitae*. Occurs on Cainozoic to Proterozoic sediments.
12.12.1	Of Concern	Of Concern	Notophyll and notophyll/microphyll vine forest, sometimes with *Archontophoenix cunninghamiana* and/or *Lophostemon confertus* closed forest. The plant families *Lauraceae, Myrtaceae* and *Elaeocarpaceae* are diagnostic of the type and *Pouteria queenslandica* is common in the northern half of the bioregion. *Araucaria cunninghamii* is often present on margins. Occurs in gullies on Mesozoic to Proterozoic igneous rocks especially granite and rhyolite.
2.12.12	Of Concern	Of Concern	*Eucalyptus tereticornis*, *E. crebra* (sometimes *E. siderophloia*) woodland. Other species present can include *Eucalyptus melanophloia*, *Corymbia tessellaris*, *Angophora subvelutina, A. leiocarpa, C. clarksoniana* (central and northern parts) and *E. siderophloia, C. intermedia* with *Melaleuca quinquenervia*, *Lophostemon suaveolens* near drainage lines in moister areas. Occurs on Mesozoic to Proterozoic igneous rocks, especially granite lowlands and basins.
12.3.11	Of Concern	Of Concern	Open-forest to woodland of *Eucalyptus tereticornis, E. siderophloia* and *Corymbia intermedia*. *Corymbia tessellaris*, *Lophostemon suaveolens* and *Melaleuca quinquenervia* frequently occur and often form a low tree layer. Other species present in scattered patches or low densities include *Angophora leiocarpa, E. exserta, E. grandis, C. trachyphloia, C. citriodora, E. latisinensis, E. tindaliae, E. racemosa, Melaleuca sieberi* and *M. viridiflora. E. seeana* may be present south of Landsborough. Occurs on Quaternary alluvial plains and drainage lines along coastal lowlands. Rainfall usually exceeds 1000mm/y
12.3.5	Of Concern	Of Concern	*Melaleuca quinquenervia* open-forest to woodland. Understorey depends upon duration of water logging; sedges and ferns, especially *Blechnum indicum*, in wetter microhabitats and grasses and shrubs in drier microhabitats. Other tree species that may be present as scattered individuals or clumps include *Lophostemon suaveolens, Eucalyptus robusta, E. tereticornis, E. bancroftii, E. latisinensis, Corymbia intermedia, Callistemon salignus, Livistona australis, Casuarina glauca, Endiandra sieberi. Melastoma malabathricum subsp. malabathricum, Glochidion sumatranum* and *Melicope elleryana* are often in understorey. Occurs on Quaternary alluvial plains in coastal areas. Major vegetation communities include: 12.3.5a: *Melaleuca quinquenervia, Casuarina glauca* +/- *Eucalyptus tereticornis* open forest. Occurs on lowest river terraces of Quaternary alluvial plains in coastal areas.
12.9-10.1	Of Concern	Of Concern	Shrubby open-forest. Canopy species include *Eucalyptus resinifera, E. grandis, E. robusta, Corymbia intermedia* ± *E. microcorys, Melaleuca quinquenervia, Syncarpia glomulifera* and *Lophostemon confertus*. Occurs on Cainozoic to Proterozoic sediments.

12.9-10.7a	Of Concern	Of Concern	*Eucalyptus tereticornis*, *E. siderophloia* and/or *E. crebra*, *Corymbia intermedia* and *Lophostemon suaveolens* woodland. Occurs on Cainozoic to Proterozoic sediments.
12.12.15	Not Of Concern	No concern at present	Open-forest with *Eucalyptus propinqua*, *Corymbia intermedia*, *E siderophloia* ± *E. microcorys*, *E. acmenoides*, *Lophostemon confertus*, *E. moluccana*, *Angophora subvelutina* and occasional vine forest species. Patches of *Eucalyptus pilularis* sometimes present. Occurs on Mesozoic to Proterozoic igneous rocks. 12.12.15a: *E. grandis* tall open-forest ± vine forest understorey. Other canopy species include *E. microcorys*, *E. acmenoides*, *Lophostemon confertus*, *E. siderophloia*, *E. propinqua*, *Corymbia intermedia* Occurs in wet gullies on Mesozoic to Proterozoic igneous rocks.
12.12.2	Not Of Concern	No concern at present	*Eucalyptus pilularis* tall open-forest with shrubby understorey. Other canopy species include *Syncarpia verecunda*, *Angophora woodsiana*, *Eucalyptus microcorys*, *E. resinifera*, *E. tindaliae*, *E. propinqua* and *E. saligna*. Occurs on Mesozoic to Proterozoic igneous rocks. Major vegetation communities include: 12.12.2a: *E. grandis*, *E. tereticornis* open-forest. Occurs in gullies on Mesozoic to Proterozoic igneous rocks.12.12.2b: *E. saligna* open-forest. Occurs on high altitude Mesozoic to Proterozoic igneous rocks.
12.3.2	Not Of Concern	No concern at present	*Eucalyptus grandis* ± *E. microcorys*, *Lophostemon confertus* tall open-forest with vine forest understorey ('wet sclerophyll'). Patches of *Eucalyptus pilularis* sometimes present especially in vicinity of sedimentary rocks (e.g. around Palmwoods). Fringing streams and in narrow gullies in high rainfall areas.
12.3.4	Not Of Concern	No concern at present	Open-forest to woodland of *Melaleuca quinquenervia* and *Eucalyptus robusta*. Occurs in drainage lines in coastal areas.
12.3.6	Not Of Concern	No concern at present	*Melaleuca quinquenervia*, *Eucalyptus tereticornis*, *Lophostemon suaveolens* woodland. Occurs on Quaternary alluvial plains and drainage lines in coastal areas.
12.9-10.14	Not Of Concern	No concern at present	*Eucalyptus pilularis* tall open-forest with shrubby understorey. Other species include *Syncarpia glomulifera*, *S. verecunda*, *Corymbia intermedia*, *Angophora woodsiana* and *Eucalyptus microcorys* in coastal areas and species of RE 12.9/10.5 in drier sub coastal areas. *Eucalyptus pilularis* sometimes extends onto colluvial lower slopes. Occurs on Cainozoic to Proterozoic sediments especially sandstone. Major vegetation communities include: 12.9-10.14a: Open-forest of *Eucalyptus grandis*, *Lophostemon confertus*, *E. microcorys*, *Syncarpia glomulifera* ± *E. pilularis*. Occurs on Cainozoic and Mesozoic sediments especially sandstone in wet gullies and southern slopes.
12.9-10.17	Not Of Concern	No concern at present	Open-forest complex generally with a variety of stringybarks, grey gums, ironbarks and in some areas spotted gum. Canopy trees include *Eucalyptus siderophloia*, *E. propinqua* or *E. major*, *E. acmenoides* or *E. portuensis*, *E. carnea* and/or *E. microcorys* and/or *Corymbia citriodora*. Other species that may be present locally include *Corymbia intermedia*, *C. trachyphloia*, *Eucalyptus tereticornis*, *E. biturbinata*, *E. moluccana*, *E. longirostrata*, *E. fibrosa subsp. fibrosa* and *Angophora leiocarpa*. *Lophostemon confertus* or Whipstick Lophostemon (supplejack) often present in gullies and as a sub canopy or understorey tree. Mixed understorey of grasses, shrubs and ferns. Hills and ranges of Cainozoic to Proterozoic sediments. 12.9-10.17a: *Lophostemon confertus* dominated open-forest. Occurs in gullies and southern slopes on Cainozoic to Proterozoic sediments. 12.9-10.17d: Open-forest with *Eucalyptus siderophloia*, *E. propinqua*, *Corymbia intermedia* ± *E. microcorys*, *E. acmenoides* or *E. portuensis*, *Lophostemon confertus*, *Eucalyptus tereticornis*, *E. moluccana*, *Angophora subvelutina* and occasional vine forest species. Other species that may be present locally include *Corymbia trachyphloia*, *E. major*, *E. fibrosa subsp. fibrosa* and *Angophora leiocarpa* Hills and ranges on Cainozoic to Proterozoic sediments.
12.9-10.4	Not Of Concern	No concern at present	Open-forest to woodland with *Eucalyptus racemosa* locally prominent. Other species can include *Angophora leiocarpa*, *Eucalyptus seeana*, *E. siderophloia*, *Corymbia intermedia*, *E. tindaliae* with *Lophostemon suaveolens*, *Melaleuca quinquenervia*, *E. tereticornis* on lower slopes. Occurs on Cainozoic to Proterozoic sediments ± remnant Tertiary surfaces.

Appendix B

Significant Species List

Significant Fauna Species List

Scientific Name	Common Name	Status under *EPBC Act*	Status under *NC Act 1992*
Mammals			
Phascolarctos cinereus	Koala		Vulnerable
Pteropus poliocephlus	Grey-headed Flying-fox	Vulnerable	Common
Reptiles			
Saproscincus rosei	Rose-shaded Skink or Challenger Skink		Rare
Acanthophis antarcticus	Common Death Adder		Rare
Amphibians			
Adelotus brevis	Tusked Frog		Vulnerable
Crinia tinnula	Wallum Frog		Vulnerable
Birds			
Accipiter novaehollandiae	Grey Goshawk		Rare
Lophoictinia isura	Square-tailed Kite		Rare
Ninox strenua	Powerful Owl		Vulnerable
Ephippiorhynchus asiaticus	Black-necked stork		Rare

Significant Flora Species

Scientific Name	Status under NC Act 1992	Status under EPBC Act
Alyxia magnifolia	Rare	
Ricinocarpos speciosus	Vulnerable	
Parsonsia tenuis	Rare	
Lenwebbia sp. (Blackhall Range P.R. Sharpe 5387)	Rare	
Floydia praealta	Vulnerable	Vulnerable
Pararistolochia praevenosa	Rare	
Papillilabium beckleri	Rare	