



**Planning &
Infrastructure**

**MAJOR PROJECT ASSESSMENT:
Princes Highway Upgrade -
Foxground and Berry Bypass
(MP10_0240)**



Director-General's
Environmental Assessment Report
Section 75I of the
Environmental Planning and Assessment Act 1979

June 2013

ABBREVIATIONS

CIV	Capital Investment Value
Department	Department of Planning & Infrastructure
DGRs	Director-General's Requirements
Director-General	Director-General of the Department of Planning & Infrastructure
EA	Environmental Assessment
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EP&A Regulation	Environmental Planning and Assessment Regulation 2000
EPI	Environmental Planning Instrument
MD SEPP	State Environmental Planning Policy (Major Development) 2005
Minister	Minister for Planning & Infrastructure
PAC	Planning Assessment Commission
Part 3A	Part 3A of the <i>Environmental Planning and Assessment Act 1979</i>
PEA	Preliminary Environmental Assessment
PFM	Planning Focus Meeting
PPR	Preferred Project Report
Proponent	Roads and Maritime Services
RtS	Response to Submissions

Cover Photograph: Existing Princes Highway looking south towards Berry (Source: EA)

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Published June 2013

NSW Department of Planning & Infrastructure

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NSW Government

Department of Planning & Infrastructure

EXECUTIVE SUMMARY

The Roads and Maritime Services (the Proponent) has sought the Minister's approval to upgrade the Princes Highway between the existing Princes Highway / Toolijooa Road intersection, (approximately 5km west of Gerringong) to the existing Princes Highway / Mullers Lane intersection, approximately (1.3km south of Berry). The distance of upgrade is approximately 11.6km. The project, known as the Princes Highway Upgrade – Foxground and Berry Bypass, is one of three upgrade projects between Gerringong and Bomaderry, required to provide a continuous four lane divided highway between Waterfall and Jervis Bay Road, Falls Creek. The project has a Capital Investment Value of \$310 million.

The road will be constructed as a dual carriageway highway with two lanes in each direction, with a wide median to allow for a future upgrade to six lanes. The major features of the proposal include:

- bypasses of the bends at Foxground and Berry;
- 5 new grade separated interchanges;
- 4 new bridges, including three bridges spanning Broughton Creek and a bridge at Berry;
- a 900m long cutting at Toolijooa Ridge approximately 26m deep;
- 2 new roundabouts at the southern interchange for Berry and the existing Princes Highway / Woodhill Mountain Road intersection; and
- the creation of public open space with shared pedestrian/cycle facilities between North Street and the new highway.

Additionally, the Proponents Response to Submissions included a number of amendments including:

- maintaining Victoria Street open to traffic with a 2 way road linking Victoria Street with Queen Street. The southbound on-ramp would commence from the roundabout at the western end of Victoria Street;
- modified Schofields Lane intersection and property access including underpass;
- realignment of the Town Creek diversion; and
- the removal of Austral Park Road turnaround facility and changes to property access in the vicinity of Austral Park Road;

The project is the only Princes Highway upgrade project being considered under Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act) (a transitional project) with the remainder of the Princes Highway Upgrade being self-assessed by the Proponent under Part 5 of the EP&A Act.

The Environmental Assessment was placed on public exhibition between 14 November 2012 and 17 December 2012 (a period of 34 days). During this period the Department received 254 submissions –with 8 submissions from public authorities and 246 submissions from the general public and special interest groups. In addition, one late submission was received objecting to the project. Of the 246 public submissions, 152 raised concerns but did not object to the project, 70 objected to the project and 24 expressed support.

The Department has assessed the Proponent's Environmental Assessment, submissions from the general public and public authorities, the Response to Submissions Report and Statement of Commitments and considers that there are some constraints that will need to be carefully managed. These include construction and operational noise impacts, property impacts and land acquisition, biodiversity impacts and offsets (particularly fauna movement and alternative habitat provision), Aboriginal and non-Aboriginal heritage impacts and soil, water and hydrology impacts. These issues were reflected in submissions from the local community and were considered by the Department in its assessment.

Based on its assessment the Department is of the opinion that the project is justified and in the public interest. The implementation of the Proponent's commitments and the recommended conditions of approval would ensure that the project is designed, constructed and operated to meet acceptable environmental performance and amenity limits. Therefore, the approval of the Princes Highway Upgrade – Foxground and Berry Bypass, subject to conditions, is recommended

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1. BACKGROUND

Roads and Maritime Services (RMS) is undertaking a series of upgrades to sections of the Princes Highway between Gerringong and Bomaderry in order to provide a continuous four lane divided highway between Waterfall and Jervis Bay Road, Falls Creek (refer **Figure 1**). The project will result in improved road safety and traffic efficiency, including for freight.

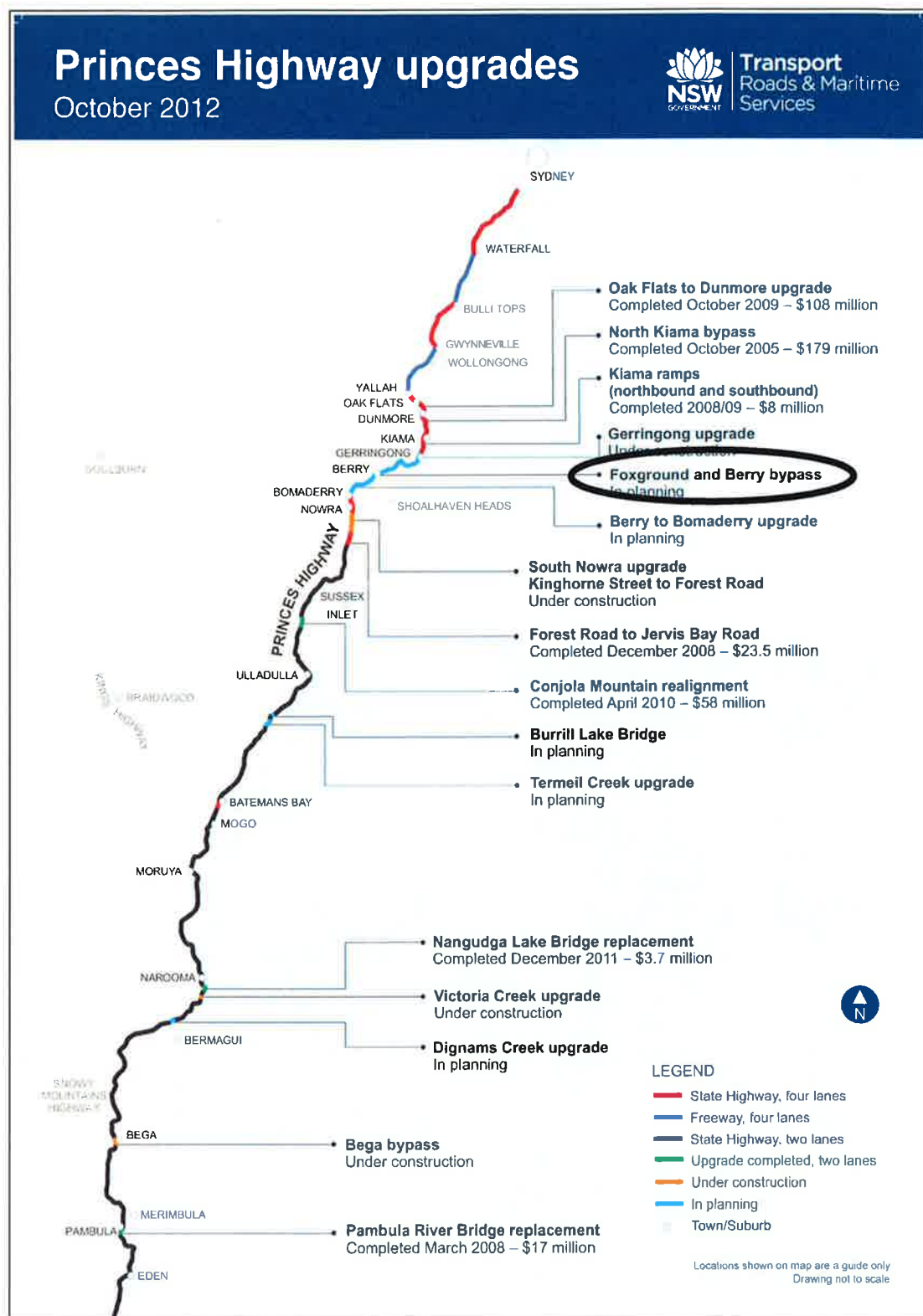


Figure 1 Overview of the Princes Highway Upgrade Program (Base Image Source: EA)

As a part of the wider scope of works, the RMS proposes to construct an 11.6km upgrade of the Princes Highway between Toolijooa Road north of Foxground and Schofields Lane south of Berry as part of the Princes Highway upgrade and will tie into the Gerringong Upgrade (determined by RMS under Part 5 of the *Environmental Planning and Assessment Act 1979* and is currently under construction). The project location is shown in **Figure 2** and **Figure 3**.

The project proposes to follow the existing highway alignment near Toolijooa Road, before deviating south over Toolijooa Ridge, bypassing the Foxground bends and rejoining the existing highway north of Austral Park Road. The project would then continue to follow the existing highway alignment until just east of Berry, where it bypasses the town to the north, before passing under Kangaroo Valley Road and rejoining the existing highway alignment south of Berry.

The land uses adjoining the project corridor generally consist of residential, rural/agricultural, commercial, a railway corridor, light industrial, nature reserves and a National Park. To the north of the project area, the Gerringong urban area consists mostly of low density housing and retail services. To the south of the project area, the Bomaderry Nowra urban area contains residential, commercial and light industrial land uses. Urban settlement in Berry also comprises residential, commercial and light industrial land uses. The South Coast Rail Line lies to the east of the project site, with a station located at Berry.

Rural residential, agriculture and conservation land uses dominate the remainder of the corridor. The key agricultural land uses include grazing associated with dairying and beef production. Clusters of rural-residential lots occur at Broughton Village, Foxground, near Tindalls Lane and west of Berry along Algers Lane. Bed and Breakfast accommodation businesses are also scattered within the rural section of the project area.

Nature reserves located in the area include Barron Grounds, Rodway and Cambewarra Range. The Budderoo National Park is located to the west of the project area. In the east, a ridgeline separates the project from the flat coastal areas. Coomonderry Swamp, Foy's Swamp and Seven Mile Creek National Park are located along the coastline.

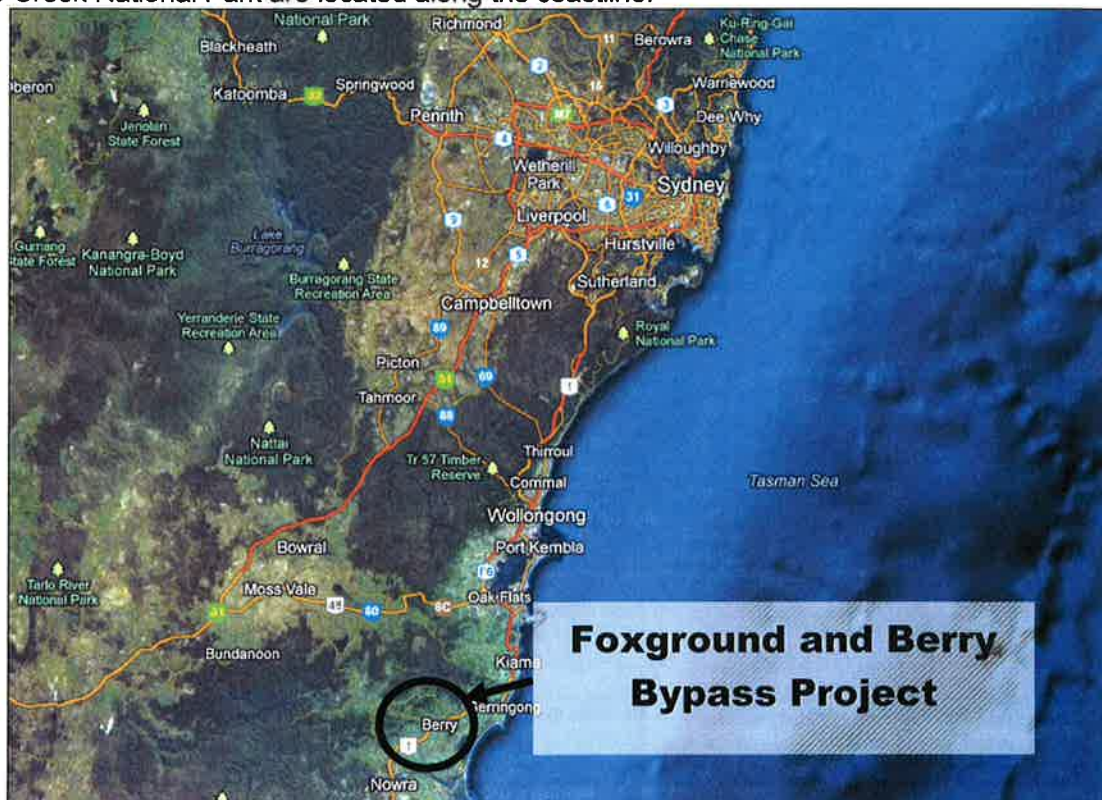


Figure 2 Project location in context with Sydney (Base Image Source: Google Maps 2013)



Figure 3 Project location (Base Image Source: EA 2012)

2. PROPOSED PROJECT

2.1. Project Description

The Foxground and Berry project comprises approximately 11.6km of motorway style upgrade between the junction of the existing Princes Highway / Toolijooa Road intersection, approximately 5km west of Gerringong to the existing Princes Highway / Mullers Lane intersection, approximately 1.3km south of Berry.

The key components of the project are listed in Table 1. The project layout is shown in **Figure 4**.

Table 1: Key Project Components Aspect	Description
<i>Project Summary</i>	<ul style="list-style-type: none"> Four lane divided carriageways (two lanes in each direction) with a median separation, with the exception of the cutting at Toolijooa Ridge which will be six lanes in each direction to allow for the provision of a climbing lane for a distance of 1.5km; Bypasses of the Foxground bends and Berry; and Potential for the addition of a future third lane in each direction within the road corridor.
<i>Grade Separated Interchanges</i>	5 x new grade separated interchanges, located at Toolijooa Road; Austral Park Road; Tindalls Lane, east of Berry at the existing Pacific Highway (northern Berry interchange); and west of Berry at Kangaroo Valley Road (southern Berry interchange).
<i>New Highway Bridges</i>	4 x new bridges, including 3 bridges spanning Broughton Creek and a bridge at Berry.
<i>Highway overbridges</i>	3 x new highway overbridges at the Austral Park Road interchange, Tindalls Lane interchange; and the Southern interchange for Berry.
<i>Underpasses</i>	8 x new underpasses, including 4 for roads and property access, 2 dedicated fauna crossings and 2 combined drainage and fauna underpasses.
<i>Road and access modifications</i>	<ul style="list-style-type: none"> Modifications to local roads including Toolijooa Road, Gembrook Lane, Austral Park Road, Tindalls Lane, North Street, Victoria Street, Queen Street, Kangaroo Valley Road, Hitchcocks Land and Schofields Lane. Access modifications to a number of existing properties, including left in/left out only provision for direct property accesses to the upgraded highway.
<i>Cuttings</i>	1 x 900m long cutting at Toolijooa Ridge approximately 26m deep.
<i>New roadway arrangements</i>	<ul style="list-style-type: none"> Dedicated u-turn facilities at Mullers Lane; the existing highway at the Austral Park Road interchange; the extension to Austral Park Road; and Rawlings Lane. 2 x new roundabouts at the southern interchange for Berry and the existing Princes Highway / Woodhill Mountain Road intersection;
<i>Watercourses</i>	Diversion of Town Creek into Bundewallah Creek north of Berry.
<i>Ancillary Facilities</i>	<ul style="list-style-type: none"> Public open space with shared pedestrian/cycle facilities between North Street and the new highway, extending between the playing fields on North Street to Kangaroo Valley Road; Permanent detention basins, stormwater treatment facilities; and A permanent operational ancillary facility site for general road maintenance.

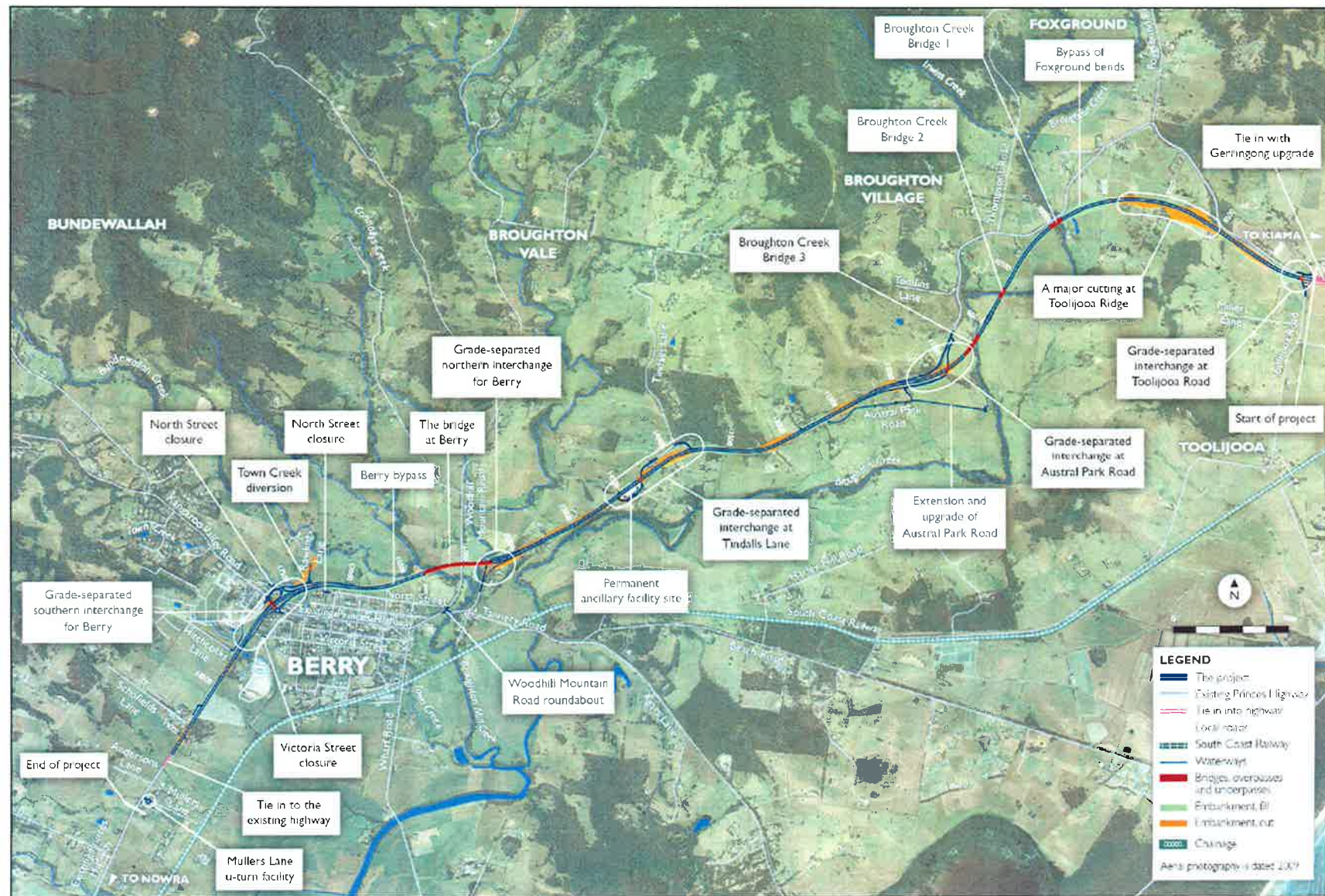


Figure 4 Key project components (Base Image Source: EA). Refer to Figure 5 for changes proposed in Submissions Report

2.2. Project Need and Justification

The Proponent has identified that the project would be consistent with key strategic plans and policies including:

NSW 2021 - the 10-year plan for the State which includes the goals of improving the efficiency of the road network and reduce travel times to improve road safety. The project would contribute to the achievement of these traffic and transport related goals.

National Road Safety Strategy for Australia 2011-2020 – the project has been designed in accordance with the current RMS road safety requirements and would improve safety on the Princes Highway.

Draft NSW Long Term Master Plan - Transport for NSW 20-year plan, addressing the provision of essential access for regional NSW and improvement of availability, reliability and timeliness, as well as the efficiency and productivity of freight transport. Improvements to the Princes Highway were identified as a current priority to support the economy and regional NSW.

Illawarra Regional Strategy 2006-2031 – identifies regional transport objectives, highlighting the importance of the upgrade of Princes Highway as the major north-south corridor linking Sydney with the Illawarra Region and the south coast of NSW. The project is consistent with these objectives.

South Coast Regional Strategy – forecasts a 36% increase in population of NSW south coast LGAs over the next 23 years, with the majority of that growth to be accommodated in Nowra and Bomaderry which has been identified as a major regional centre. The project is consistent with this strategy as it would improve safety and efficiency of the major transport corridor in a rapidly growing region, enabling economic development to continue.

The existing rail network terminates at Bomaderry (Nowra), making the Princes Highway a major freight and bus route linking Sydney and Wollongong to the NSW south coast and north eastern Victoria. Additionally, the Princes Highway is a major tourist route, providing access to coastal communities, recreational areas (such as state forests and national parks) and is used as an alternative route from Sydney/Wollongong to Melbourne.

The Foxground and Berry Bypass project is part of the Princes Highway upgrade which is being implemented to provide a continuous four lane divided highway between Waterfall and Jervis Bay Road, Falls Creek. The NSW Government allocated \$9 million in the 2012-2013 budget to continue the planning and pre-construction activities for the project.

Within the project area the existing highway is a two lane, undivided road with limited overtaking opportunities and a number of different speed zones responding to current road conditions. Further, the existing highway through Berry poses pedestrian safety risks and reduces the amenity of the township. 'The Sandtrack' is an alternative, flatter route to the south coast, connecting Gerringong to Bomaderry via Seven Mile Beach and carries 40-45% of through traffic (predominately light vehicles due to a 5 tonne load limit).

The existing highway near Berry carried an average annual daily traffic (AADT) of approximately 10,000 to 12,500 vehicles per day in 2009 and 2011, with 11-13% being heavy vehicles. This figure is expected to increase to 16,500-21,000 by 2037, with a similar proportion of heavy vehicles. The Princes Highway around Berry currently operates at a Level of Service (LoS) D in AM and PM peak periods and up to LoS E in holiday periods. In a "do nothing scenario", by 2027 this is expected to worsen to LoS E in AM and PM peak periods, and F in holiday periods. These increases on the existing highway would put pressure on the efficiency of the highway by lowering average speeds and increasing delays around Berry. The project would assist in providing a more efficient transport route along the project corridor.

In terms of road safety, the existing highway has a current fatality rate of around 0.8 per 100 million vehicle kilometres travelled (MVKY), and the alternative 'Sandtrack' route along the coast has a fatality rate of 0.7 per 100 MVKT compared to the state-wide average of 0.5 per 100 MVKT. The upgraded highway would improve road safety by maintaining a consistent speed limit, improving horizontal and vertical alignments, reducing the frequency of conflicting turning movements by removing highway traffic from within Berry, consolidating access to grade separate interchanges, and restricting direct access elsewhere to left-in left-out.

Based on the AADT on the 'Sandtrack' which comprises approximately 6,500 – 8,500 vehicles per day in 2009 and 2011, the traffic split between the existing highway and the 'Sandtrack' is 55/45 to the north of Berry and 60/40 to the south of Berry. By 2037 and following the Princes Highway Upgrade between Gerringong and Bomaderry, the traffic split between the existing highway and the 'Sandtrack' is expected to change to 84/16 to the north of Berry and 87/13 to the south of Berry. This would result in reduced traffic and therefore increased safety and amenity along this route.

Currently, the highway has poor flood immunity, particularly between Woodhill Mountain Road and Prince Alfred Street immediately north of Berry, which is susceptible to flooding in the 1 in 5 year flood event. The upgraded highway at this location would result in a flood immunity of 1 in 100 year flood event, increasing road safety and efficiency by maintaining access during major flood events.

The Department accepts that the project would provide a number of social and economic benefits to those living along and using the Princes Highway corridor such as improved safety and amenity within Berry, improved flood immunity and improved safety and efficiency of the highway. Additionally, the project would result in improvements to the 'Sandtrack' due to a reduction in the number of vehicles using this route, particularly in relation to road safety and improved safety and amenity in Gerringong. Consequently, the Department accepts the Proponent's need and justification for the project, including the aims of improving safety and providing greater traffic efficiency for regional and inter-State transport.

3. STATUTORY CONTEXT

3.1. Major Project

On 27 August 2010 the Minister for Planning declared the project to be subject to Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act) under section 75B of that Act. Therefore the Minister for Planning is the approval authority, subject to relevant delegations.

3.2. Continuing Operation of Part 3A

Part 3A of the EP&A Act, as in force immediately before its repeal on 1 October 2011 and as modified by Schedule 6A to the EP&A Act, continues to apply to transitional Part 3A projects. The Director-General's environmental assessment requirements (DGRs) have been issued in respect of this proposal and the environmental assessment report was lodged prior to 1 October 2011. The proposal is therefore a transitional Part 3A project.

This report has been prepared in accordance with the requirements of Part 3A and associated regulations. The Minister for Planning and Infrastructure may approve or disapprove of the carrying out of the proposal under section 75J of the EP&A Act.

3.3. Permissibility

The project is permissible under all relevant environmental planning instruments (EPIs). The project would pass through:

- The *Kiama Local Environmental Plan 2011* (Kiama LEP), including zone SP2 Infrastructure (Classified Road), zone RU2 Rural Landscape and zone E3 Environmental Management; and
- The *Shoalhaven Local Environmental Plan 1985* (Shoalhaven LEP), with the majority of the project area zoned 1(b) Rural (Arterial and Main Road Protection) and 5(d) Special Uses (Proposed Arterial Roads Preservation and Widening of Existing Arterial Roads Preservation).

Under the exhibited draft Shoalhaven LEP 2013, the project would pass through 6 zones, including RU1 Primary Production, SP2 Infrastructure, RE1 Public Recreation, R2 Low Density Residential, R5 Large Lot Residential and E3 Environmental Management (Town Creek).

Under these existing and draft LEPs, roads are permitted in all land use zones through which the project passes.

Additionally, the *State Environmental Planning Policy (Infrastructure) 2007* (Infrastructure SEPP) permits through clause 94(1) development for the purpose of a road or road infrastructure facilities to be carried out by or on behalf of a public authority on any land, without consent.

3.4. Delegations

On 27 February 2013, the Minister for Planning and Infrastructure delegated his functions under section 75J of the EP&A Act to nominated officers of Department of Planning and Infrastructure for the determination of transitional Part 3A projects where the local council does not object, a political disclosure statement has not been made in relation to the application, and less than 25 objections are received. A total of 246 submissions were received from the public, 70 of which objected to the project. As such, the terms of this delegation do not apply and the Minister for Planning and Infrastructure is the determining authority for this project.

3.5. Environmental Planning Instruments

Under Sections 75(2)(d) and 75(2)(e) of the EP&A Act, the Director-General's report for a project is required to include a copy of, or reference to, the provisions of any State Environmental Planning Policy (SEPP) that substantially governs the carrying out of the project, and the provisions of any environmental planning instruments (EPI) that would (except for the application of Part 3A) substantially govern the carrying out of the project and that have been taken into consideration in the assessment of the project.

The *Illawarra Regional Environmental Plan No. 1*, a deemed State Environmental Planning Policy, would apply in this case, as it maps the Seven Mile Beach National Park/Barren Grounds Nature Reserve wildlife corridor which this project would cross. A consideration of this corridor is provided in **Section 5** of this report. The proposal is considered to be consistent with the relevant requirements of the *Illawarra Regional Environmental Plan No. 1*.

3.6. Objects of the EP&A Act

Decisions made under the EP&A Act must have regard to the objects of the Act, as set out in Section 5 of the Act. The relevant objects are:

- (a) *to encourage:*
 - (i) *the proper management, development and conservation of natural and artificial resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment,*
 - (ii) *the promotion and co-ordination of the orderly and economic use and development of land,*
 - (iii) *the protection, provision and co-ordination of communication and utility services,*
 - (iv) *the provision of land for public purposes,*
 - (v) *the provision and co-ordination of community services and facilities, and*
 - (vi) *the protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats, and*
 - (vii) *ecologically sustainable development, and*
 - (viii) *the provision and maintenance of affordable housing, and*
- (b) *to promote the sharing of the responsibility for environmental planning between the different levels of government in the State, and*
- (c) *to provide increased opportunity for public involvement and participation in environmental planning and assessment.*

Of particular relevance to the assessment of the project application, are those objects stipulated under section 5(a) (i), (ii), (vi), and (vii) of the EP&A Act. The Department has given due consideration to the objects of the EP&A Act in its assessment, including:

- the proper management, development and conservation of natural and artificial resources, including natural areas, forests, water, towns and villages – the Department's assessment of the project has considered bio-physical impacts to natural areas including forests and water resources in **Sections 5.3 & 5.6** as well as amenity and socio-economic impacts to Berry in **Sections 5.4 & 5.5**;
- the promotion and co-ordination of the orderly and economic use and development of land - the Department has assessed the biophysical and amenity constraints of the proposal in **Sections 5.3, 5.4 & 5.5** and the strategic need for the project in **Sections 2.2 & Sections 5.1**;
- the protection of the environment including the protection and conservation of native animals and plants including threatened species, populations, and ecological

communities and their habitats – the Department's assessment of flora and fauna issues is provided in **Section 5.6**; and

- ecologically sustainable development – the Department's assessment of the project has considered the principles of ecologically sustainable development, and the need to balance these principles with other social, economic, and environmental factors. In its assessment of the project against the principles of ecologically sustainable development, the Department has considered:
 - the Proponent's assessment which considered the 'worst case scenario' of the project impacts, consistent with the precautionary principle;
 - the Proponent's consideration of issues that have long-term term implications (such as consumption of non-renewable resources, waste disposal, greenhouse gas emissions, removal of vegetation, impacts on visual amenity and water quality), which has sought to avoid and minimise adverse impacts as far as possible through route selection and application of the proposed mitigation measures, consistent with the principles of inter-generational equity and the conservation of biological diversity and ecological integrity; and
 - the Proponent's commitment to appropriately value and offset residual impacts (such as biodiversity), consistent with the principle of improved valuation, pricing, and incentive mechanisms.

3.7. Ecologically Sustainable Development

The EP&A Act adopts the definition of Ecologically Sustainable Development (ESD) found in the *Protection of the Environment Administration Act 1991*. Section 6(2) of that Act states that ESD requires the effective integration of economic and environmental considerations in decision-making processes and that ESD can be achieved through the implementation of:

- (a) *the precautionary principle,*
- (b) *inter-generational equity,*
- (c) *conservation of biological diversity and ecological integrity,*
- (d) *improved valuation, pricing and incentive mechanisms.*

The Department has given due consideration to the principles of ESD in its assessment and the proposal is consistent with the principles of ESD.

The proposal is consistent with the precautionary principle as Flora and Fauna field investigations were undertaken to enable the avoidance of important ecological features during the initial route selection phase, where possible. All other constraints such as traffic, noise and vibration, soil and water, urban design, socio-economic, property and Aboriginal and non-Aboriginal heritage have been taken into account in both the route selection phase and design refinement phase. An environmental risk analysis was completed for the project development and EA, and all worst case potential environmental impacts have been assessed and mitigation measures have been developed to manage those worst case impacts.

The proposal promotes intergenerational equity and the project has included a number of specialist reports to assess environmental, social and economic costs and benefits to the current community and future generations. The outcomes of a climate risk assessment and flood management study have influenced, in particular, the culvert and bridge design, enabling the highway to be used by future generations. While some Berry residents may experience increased noise levels and some Berry businesses may experience some short term economic decline for those businesses relying primarily on through traffic, other benefits such as increased driver and pedestrian safety, improved amenity and reduction in flood impacts as a result of the Town Creek diversion are considered to be good planning outcomes. The Department considers that the social and economic benefits are expected to outweigh any negative impacts that cannot be mitigated.

The proposal conserves biological diversity and ecological integrity by minimising impacts on flora and fauna species that inhabit or visit the Foxground and Berry area. This has been achieved through careful route selection, the design of appropriate fauna connectivity structures, and the consideration of appropriate revegetation strategies. Impacts that cannot be mitigated, such as the unavoidable loss of River-flat eucalypt forest Endangered Ecological Community, have been addressed in the Biodiversity Offset Strategy.

The proposal promotes improved valuation, pricing and incentive mechanisms by considering the pricing of environmental resources (i.e. water, energy, waste products) throughout the assessment process, demonstrated in the socio-economic assessment, the Biodiversity Offset Strategy and the socio-economic assessment. Costs associated with the planning and design and implementation of relevant mitigation measures have been incorporated into the overall project costs.

3.8. Statement of Compliance

In accordance with Section 75I of the EP&A Act, the Department is satisfied that the Director-General's environmental assessment requirements have been complied with.

4. CONSULTATION AND SUBMISSIONS

4.1. Exhibition

Under Section 75H(3) of the EP&A Act, the Director-General is required to make the EA of an application publicly available for at least 30 days. After accepting the EA, the Department publicly exhibited it from 14 November 2012 until 17 December 2012 (34 days) on the Department's website, and at the Department's Information Centre, Roads and Maritime Services, North Sydney, Kiama Municipal Council, Kiama Library, Shoalhaven City Council, Nowra Library and the Nature Conservation Council of NSW. The Department also advertised the public exhibition in the Sydney Morning Herald, The Daily Telegraph, Illawarra Mercury, Kiama Independent, The Nowra Shoalhaven Times and the South Coast Register on 14 November 2012 and notified relevant State and local government authorities in writing.

The Department received 255 submissions on the project. A total of 254 submissions were received during the exhibition of the EA including 8 submissions from public authorities and 246 submissions from the general public and special interest groups. One late submission was received objecting to the project. A summary of the issues raised in submissions is provided below.

4.2. Public Authority Submissions

A total of 8 submissions were received from public authorities, each raising issues regarding the project. There were no objections received. Each of these submissions is summarised in the following:

Kiama Municipal Council supports the proposed upgrade, and provided the following comments:

- recommends that stormwater management be updated to include details of potential flooding impacts on properties within the Broughton Creek catchment for the PMF flooding event;
- is concerned regarding the left-in left-out provisions for properties in Toolijooa and Foxground and the use of Austral Park Road interchange by heavy vehicles;
- requests a dilapidation report be produced and ongoing maintenance required for roads, footpaths, drainage and other infrastructure impacted by construction works;
- advises that reasonable public access should be provided to all impacted properties during the construction period, and notes that it does not support existing private entry roads opposite Foxground Road being reclassified as public roads;
- requests that severing of lot parcels be addressed by the Proponent;
- advises that retro-fitting of existing dwellings is preferable in order to mitigate noise impacts; and
- requests that it be consulted during the preparation of the CEMP and clarification over the future ownership of fauna crossing structures.

Shoalhaven City Council supports the proposed upgrade, however provided the following comments:

- recommends that the highway be designed to include planning for and land reservation for a future northbound exit at the eastern end of Berry;
- advises that it prefers a modified Option 3 for Victoria Street with direct access to exit or enter the highway, and mitigating extensive impacts on Mark Radium Park with the construction of a 2-way road from the Kangaroo Valley Road roundabout to the proposed roundabout on Victoria Street to Council local road standards rather than the proposed RMS highway design standards;

- requests that an assessment of the existing conditions and a commitment for maintenance be undertaken for the 'Sandtrack' during the construction phase of the new highway;
- requests discussions with the Proponent for landscape design improvements, as well as the relocation of the Alexander and David Berry sculptures; and
- requests discussions between Council and the Proponent regarding the potential impacts and relocation of the Berry Riding School.

NSW Department of Primary Industries advises that Forests NSW have no forestry issues relating to the proposed development, however the NSW Office of Water, Fisheries NSW and Agriculture NSW made the following comments:

NSW Office of Water

- recommends that a groundwater management plan be prepared and that consideration is given to potential geomorphic impacts where construction works may be located within waterways (as the project has the potential to impact on groundwater, groundwater dependent ecosystems, and water users); and
- supports the inclusion of mitigation measures in relation to the protection of waterways and riparian corridors.

Fisheries NSW

- concurs with the proposed safeguards and mitigation measures to minimise environmental impacts related to biodiversity, aquatic ecology, surface water, groundwater, flooding, and geology and soils;
- concurs with the commitment to develop a biodiversity offset package; and
- recommends that the project approval requires the design and construction of temporary and permanent road crossing to be undertaken in accordance with Fisheries NSW's Policy and Guidelines.

Agriculture NSW

- recommends that properties severed from the main farm still maintain access to the farm via underpasses, and advises that provision will need to be made for facilities to herd stock and to enable emergency services through underpasses;
- advises that the 'green' and 'orange' options are the preferred options from an agricultural perspective due to minimisation of severance of properties; and
- Notes that the revised Option 3 for the Northern Berry access appears to be the most practical from other perspectives.

NSW Trade & Investment – Crown Lands

Recommends that the section of constructed Princes Highway between Tannery Road and Lot 3 DP 1081231 be transferred to RMS, the section of constructed local road being Pulman Street be transferred to Shoalhaven City Council, and the Crown Land between the Princes Highway and Woodhill Mountain Road should be scoped for potential inclusion with the development proposal.

NSW Environment Protection Authority (EPA)

- supports the use of low noise pavements and noise barriers as proposed, and considers the construction noise management levels adopted in the Technical Paper to be appropriate;
- recommends effective communication, clear justification, temporary noise barriers and the need to minimise construction traffic movements outside of standard hours to mitigate impacts of works to an appropriate level;
- recommends as part of any approval that a detailed air quality monitoring plan be prepared; and

- recommends conditions to ensure that the proposal be undertaken in a manner so as to not discharge pollutants to either surface waters and/or groundwater; and to manage the removal of waste materials.

Office of Environment and Heritage (OEH)

- raises concerns that the entirety of biodiversity impacts of the development (30.4 hectares of native vegetation) is not being taken into consideration in the calculation of the offset required for the project, and that it is inconsistent with the Roads and Maritime Services *Guideline for Biodiversity Offsets* (November 2011), as the proposal would involve more than 5 hectares of native vegetation clearing;
- recommends that hollow bearing trees proposed to be cleared should also be included in any offset strategy;
- raises concerns about the potential placement of some temporary ancillary facilities on areas containing Aboriginal cultural heritage values, but notes that a number of Aboriginal heritage issues raised in OEH's EA adequacy comments have been addressed by the Proponent; and
- advises that the recommendations made in the Aboriginal Cultural Heritage Assessment should be included in the project approval.

Heritage Branch

- notes that the design of parts of the new road have been refined to reduce non-Aboriginal heritage impacts;
- advises that the assessment of the 'Glen Devan' homestead in the EA is incorrect, with new local research by the Local Historical Society indicating that the cottage was originally built in the 1870s. As a result, the Heritage Branch recommends that the building be relocated rather than demolition or salvaged for future interpretation;
- recommends that conditions on any approval involve the preparation of a Non-Indigenous Heritage Management Plan, the nomination of a specialist heritage consultant for works, site personnel training regarding obligations and requirements in relation to historical archaeological sites and 'relics', the implementation of site protection systems and photographic and archival recording of all affected Heritage items; and
- recommends the lodgement of any necessary final excavation report(s) with the Heritage Council of NSW, the Local Studies Library and the Local Historical Society in the relevant Local Government Area.

Shoalhaven Water

- requests that, prior to commencement of works, the Proponent apply in writing under the Water Management Act 2000 for a Certificate of Compliance from Shoalhaven Water, noting that separate Compliance Certificates may be needed in the event that the development be completed in stages;
- advises that the Proponent will need to relocate, deviate, protect or redirect any infrastructure impacted by the project, including sewer and water pipelines; and
- notes that it does not approve concrete encasement of AC water mains.

4.3. Public Submissions

A total of 246 submissions were received from the public. This included submissions from the following special interest groups:

- Berry Alliance (Better Options for Berry);
- Berry Riding Club;
- Berry Landcare;
- The Arbour Residents Committee;
- The North Street Corridor Amenity Group;
- Royal Australian Historical Society; and
- Berry and District Historical Society.

Of the 246 public submissions, 70 (28%) objected to the project, 24 (10%) supported the project and 152 (62%) did not object but raised concerns. The key issues raised in public submissions are listed in **Table 2**.

Table 2: Summary of Key Issues Raised in Public Submissions

Issue	Proportion of submissions (%)
Closure of Victoria Street	29
Traffic issues in Berry	26
Impacts to the Berry Equestrian Centre	21
Access and future use of Mark Radium Park	21
Noise and/or vibration impacts of the proposed roadway	12
Severance of the Berry township and external properties by the proposal	11
Biodiversity impacts	10
Noise walls and visual impact	10
Restriction of property access	9
Obstruction of views and sightlines	9
Reduced emergency vehicle access	8
Pedestrian safety	8
Loss of housing, agricultural land and/or recreational land	7
Changes to flood behaviour	6
Inadequate community consultation	5

The Department has considered the issues raised in submissions, including those raised by the Royal Australian Historical Society and the Berry and District Historical Society in its assessment of the project.

4.4. Proponent's Response to Submissions

The Proponent provided a response to the issues raised in submissions (Response to Submissions) which is included in **Appendix C**. The RtS included a response to the issues raised in submissions from the general public and public authorities and included the following amendments (Refer **Figure 5**):

- adoption of Victoria Street Option 3, which maintains Victoria Street open to traffic with a 2 way road linking Victoria Street with Queen Street. The southbound on-ramp would commence from the roundabout at the western end of Victoria Street;
- modified Schofields Lane intersection and property access including underpass;
- realignment of the Town Creek diversion;
- removal of Austral Park Road turnaround facility and changes to property access in the vicinity of Austral Park Road;
- modifications to local road/property access in the vicinity of the Tindalls Lane interchange; and
- removal of retaining wall and reshaping of existing dam near the northern interchange for Berry.

The Department forwarded a copy of the RtS to Kiama Municipal Council, Shoalhaven City Council, the Office of Environment and Heritage (OEH) (including the Heritage Branch), the Environment Protection Authority (EPA) the Department of Primary Industries (DPI) (including the NSW Office of Water (NOW)) for comment.

The documents were also placed on the department's website. One submission was received from a local resident raising concerns regarding access to the BUPA aged care facility, and one submission was received from the North Street Corridor Amenity Group raising concerns regarding the asbestos risks in Telstra pits and construction traffic management.

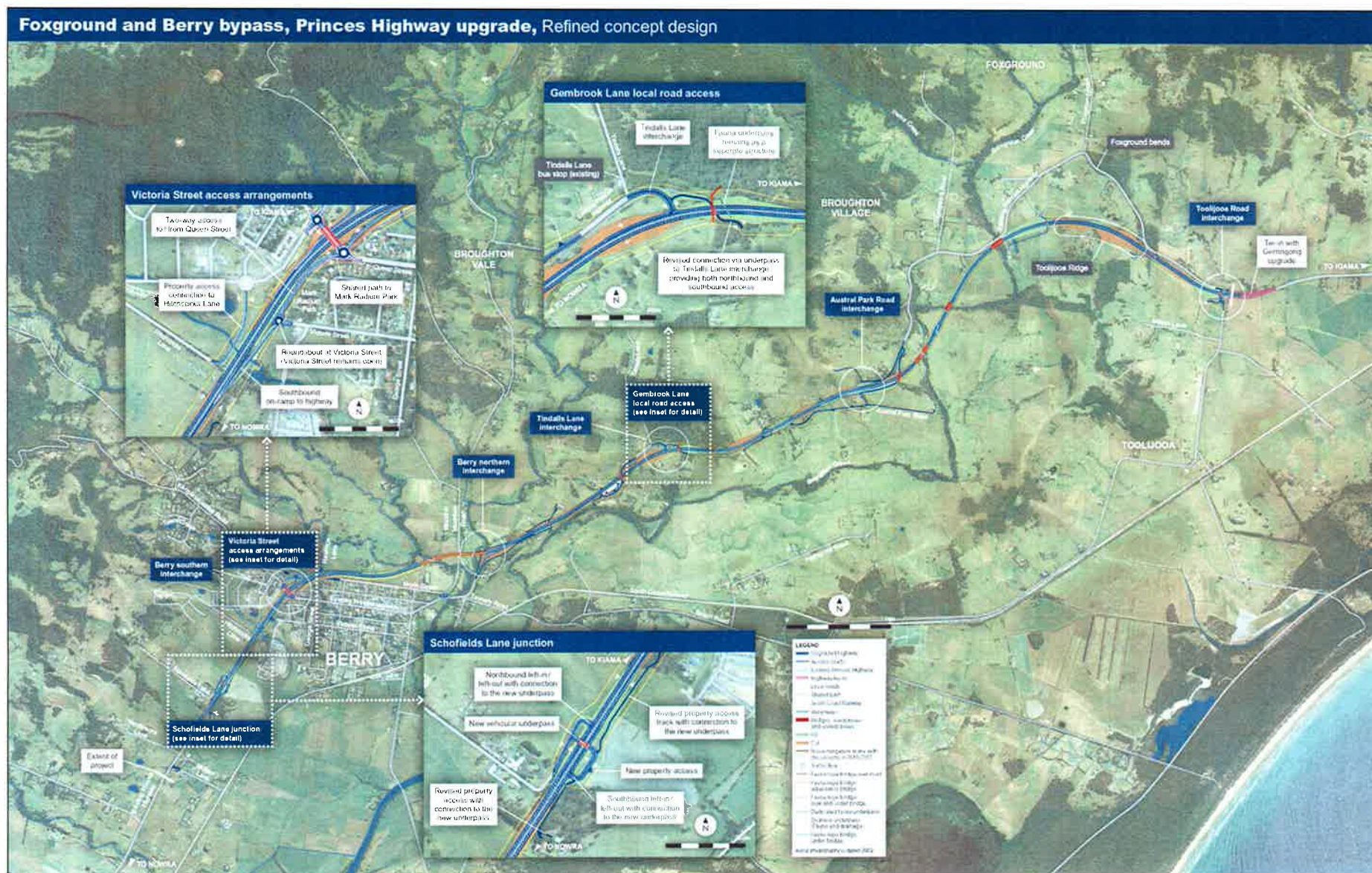


Figure 5 Refined Concept Design (Base Image Source: RtS).

A summary of Council and agency comments on the RtS is provided below.

Kiama Municipal Council

- Reiterates its concern over the long-term ownership and maintenance of sedimentation basins and fauna crossing structures;
- reiterates its concern over a private access road near Foxground Road that services 3 properties being made a public road;
- demonstrated consultation with local bus operators has not been provided/previous concerns have not been addressed; and
- believes the Proponent has not addressed its comments relating to treatment of plain concrete surfaces.

The Department has obtained confirmation from the Proponent that consultation with all relevant bus companies (including Gerringong Buses and Gerringong Coachlines) was undertaken during the preparation of the EA. Matters relating to ongoing ownership and maintenance of highway facilities will be included in the Proponent's existing environmental management systems. Council will be consulted during the preparation of the Urban Design Landscape Management Plan as required by the recommended conditions of approval.

Shoalhaven City Council

- request the project be designed to ensure on and off ramps at Woodhill Mountain Road and a left turn onramp from Toolijooa Road onto the new highway can be provided in the future by way of road reservations;
- supports the revised treatment of Victoria Street and requires a signage strategy to be developed for Mark Radium Park; and
- requires that for the 'Sandtrack', dilapidation reports, and methodology of the proposed monitoring be subject to further consultation with Council.

The Department has recommended conditions of approval to address Council's concerns.

DPI (NSW Office of Water)

No further comment.

DPI (Fisheries NSW)

- concurs with the revised statement of commitments, and states that these should be included in any approval and environmental management plans; and
- agrees with the commitment to develop a Biodiversity Offset Package, with an offset ratio of 2:1 for riparian vegetation.

DPI (Agriculture NSW)

No further comment.

NSW Trade & Investment – Crown Lands

The matter of the transfer of Crown lands into RMS/Council ownership should be given greater consideration, and as a minimum be included in any condition of approval. This matter has been addressed via a recommended condition of approval.

NSW Environment Protection Authority

- agrees that appropriate controls to manage and mitigation construction noise and vibration can be implemented via the Construction Noise and Vibration Management Plan and requests that it is consulted in the preparation of this plan.

Office of Environment and Heritage

- Reiterates its concern that only 2.7 hectares (EEC) is proposed to be offset, rather than the 30.4 hectares of native vegetation to be cleared. The proposed clearing provides

foraging, roosting and breeding habitat for 9 threatened species of which 7 of these species are considered to be hollow dependant;

- maintains its concern over the Proponent's assessment of direct and indirect impacts, particularly in relation to hydrology;
- further information should be provided in relation to the mitigation measure of replacement planting along Broughton Creek and the connection of the Broughton Creek to Toolijooa Ridge Wildlife Corridor to demonstrate that this measure would be adequate to offset impacts of the project;
- OEH considers the current RMS guidelines for biodiversity offsets should be taken into account regardless of when the proposed offsets were developed;
- note that not all Aboriginal heritage recommendations from the Technical Paper have been included in the revised statement of commitments. OEH have therefore recommended some revisions to address these omissions;
- maintains the importance of avoiding areas containing Aboriginal cultural heritage values for temporary ancillary construction facilities; and
- recommends some matters be clarified in post approval construction related documents such as defining 'exceptional significance' in the Unexpected Archaeological Finds Procedure and a selective testing procedure to be outlined in the Aboriginal Heritage Management Plan.

The Department has considered biodiversity issues in **Section 5.6**, hydrology issues in **Section 5.3** and Aboriginal heritage in **Section 5.6**, and has also recommended a number of conditions to address these concerns. Further consultation with OEH would occur during the preparation of the Biodiversity Offset Strategy and Heritage Management Plans.

Heritage Branch

- Reiterates concern in relation to the mitigation measures proposed for Glen Devan; and
- notes that not all recommendations listed in the EA have been included in the Statement of Commitments and as such, all previously recommended conditions should be included in any approval granted.

The Department has taken into consideration all recommended conditions by the Heritage Branch in the recommended conditions of approval. Further consultation with the Heritage Branch would occur in relation to specific sites and during the preparation of the Heritage Management Plan.

Shoalhaven Water

No further comment.

5. ASSESSMENT

In consideration of the EA, Response to Submissions and revised Statement of Commitments, and issues raised in agency and public submissions, the Department considers the key assessment issues associated with the proposal to include:

- traffic;
- noise and vibration;
- flooding and hydrology;
- urban design; and
- socio-economic and property impacts.

The Department's consideration of these key issues is provided in **Sections 5.1 to 5.6** of this report.

The Department has also considered other issues raised in submissions and the Proponent's assessment, including flora and fauna, non-Aboriginal and Aboriginal heritage and ancillary facilities. The Department considers that these issues are manageable in consideration of the Proponent's statement of commitments and the proposed conditions. The Department's consideration of these issues is contained in **Section 5.6**.

5.1. Traffic

Route Selection

The Proponent has undertaken an assessment process to determine the most appropriate route based on the following objectives of the project:

- improving road safety;
- improving efficiency of the Princes Highway between Toolijooa Road and Schofields Lane;
- supporting regional and local economic development;
- providing value for money;
- providing significant beneficial environmental effects for the Berry town centre and managing potential adverse environmental impacts elsewhere; and
- optimising the benefits and minimising adverse impacts on the local social environment.

The preliminary options were further developed following technical specialist assessment of the physical, environmental and social constraints of each option. The refinement of the options included community and stakeholder consultation. In order to arrive at the preferred route, the options were assessed against project objectives for specific sections of the project, including:

- access options for Berry;
- bypass design options for Berry;
- design for the bridge at Berry;
- alignment options and design around the North Street precinct;
- arrangement of the southern interchange for Berry;
- options for the intersection of the Princes Highway and Victoria Street in Berry;
- a southern bypass of Berry;
- pedestrian access in Berry;
- suitable rest area locations; and
- protecting the Pulman Street heritage precinct.

The Proponent has chosen the preferred route for the following reasons:

- improvements to road safety and efficiency of the Princes Highway, particularly near Foxground and Berry;
- it supports regional and local economic development;
- it could provide the opportunity to upgrade the existing alignment which would minimise impacts on the environment, communities and the local economy;
- provides the least change to community connectivity; and
- provides beneficial effects for Berry by bypassing and removing highway traffic from the town, while remaining close enough to the town to minimise the loss of highway generated trade.

Community feedback identified significant interest on whether the preferred option would run to the north or the south of Berry. Route selection focused on the northern options, from which the preferred option was selected, however the Proponent also investigated the viability of southern options. The southern bypass of Berry option is shown in **Figure 6**.

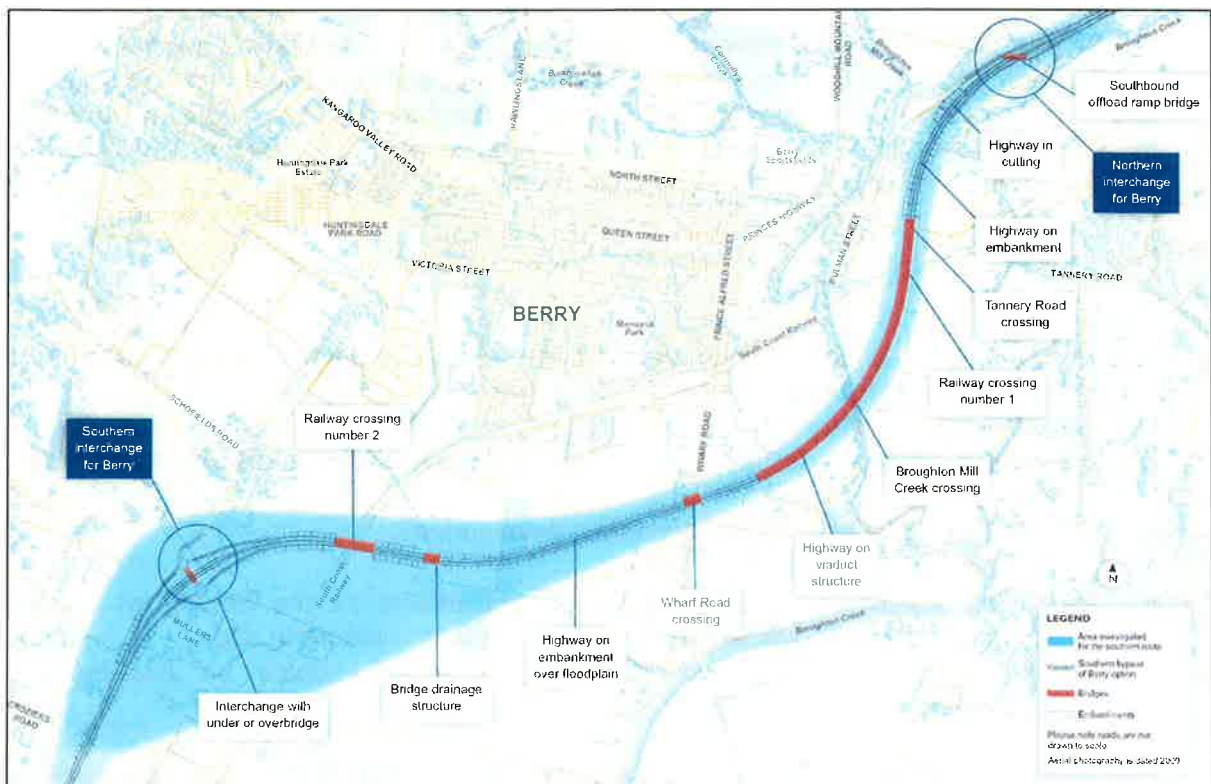


Figure 6 – Southern Berry bypass option

The southern option followed the existing highway before running directly south, on the eastern side of Berry, rejoining the existing Highway near Mullers Lane. This option was considered in the long list of options against social, environmental and economic constraints but did not perform as well as northern options in meeting project objectives. Additionally, a *Report on Route Feasibility and Comparative Cost Estimates* (RMS 2012) was prepared for this option, concluding that the southern bypass would cost around \$150 million more to construct than the preferred northern option, primarily due to the cost of structures and earthworks required.

Construction Traffic

The assessment of construction traffic impacts was undertaken for both worst case and most-likely scenarios. Worst case scenarios are based on the holiday peak period and the most-likely scenario is based on the standard AM and PM peaks. The Proponent's assessment of these scenarios was based on the following:

- anticipated 2017 traffic volumes, which coincides with the expected final year of construction;

- the Gerringong Upgrade having been completed and operational;
- the project not being operational with Princess Highway traffic travelling through Berry;
- an 80km/h construction speed limit throughout the project area; and
- delays due to passing constraints along the existing highway resulting from construction zones.

The Princes Highway runs through Berry and services both local and commuter/tourist vehicles. The Highway also intersects with a number of local roads (such as Alexandra Street) to provide access to the residential, business and other service and recreational areas of Berry.

There is also the 'Sandtrack' which comprises Fern Street, Crooked River Road, Gerroa Road and Bolong Road. It is in the vicinity of the highway and runs to the east of Berry to provide alternative access for light vehicles between Gerringong and Bomaderry, as indicated in **Figure 7**.



Figure 7 – The 'Sandtrack' (purple)

Construction of the project would result in additional vehicles utilising the existing Princes Highway and the local road network including:

- construction workers travelling to and from the project work sites;
- delivery of heavy vehicle, machinery and other construction related equipment;
- delivery of construction materials; and
- transportation of spoil resulting from earthworks.

The majority of the additional construction traffic will traverse between Kiama, Port Kembla and Wollongong. The primary construction traffic route would include the existing highway and the upgraded section of highway between Gerringong and the project. In addition, there will be construction vehicles in Berry to source and transport material to/from the project and to the compound area adjacent to Woodhill Mountain Road. The compound area is to be located south of North Street and is to be accessed via Kangaroo Valley Road. All other compound stockpile sites and construction compounds would be accessed directly from the existing highway or would involve additional travel for short distances on local roads after turning off the highway.

The final number of vehicle movement required for the project would be dependent upon its final design. The Proponent estimates that there would be 90,000 heavy vehicle movements generated during construction (106 heavy vehicle movements per day) and 130 light vehicle movements per day.

It is expected that there will be traffic delays resulting from the required road closures/disruptions in conjunction with increased construction traffic. These temporary delays include:

- interchange tie-ins and modification of existing tie-ins;
- works required on local roads; and
- local road severance.

The following construction areas are expected to result in the most significant traffic impacts:

- the Kangaroo Valley Road overpass at the southern interchange to Berry will require a temporary road closure;
- North Street and Rawlings Lane properties will require access modifications;
- an increase in traffic of approximately 3% utilising the "Sandtrack" instead of the highway; and
- potential use of Toolijooa Road to avoid construction related traffic delays.

Level of service (LoS) is an indicator used to assess the level of impact traffic changes will have upon road network performance. The Proponent has prepared an analysis of LoS for both the midblock (including the 'Sandtrack') and the intersection performance surrounding Berry. The LoS score ranges from an "A" which signifies overall good operation with an average vehicle delay of less than 14 seconds per vehicle, to an "F" which signifies conditions that are failing with average vehicle delays that are greater than 70 seconds.

The midblock predictions indicate that LoS will be largely unaffected as a result of construction. However, there will be significant downgrades in LoS for a number of intersections in the worst case scenario (holiday period) for construction. The most significantly affected intersections include the following:

- Queen Street (Princes Highway)/Alexandra Street. In the AM and PM peaks this intersection is operating at LoS B (year 2017). During worst case construction, the south bound run on Alexandra Street will drop to a LoS F; and
- Queen Street (Princes Highway)/Prince Alfred Street. In the AM and PM peaks this intersection is operating at LoS A and B respectively (year 2017). During worst case construction, the northbound run on Prince Alfred Street will drop to a LoS E.

These intersections are the most notably impacted as a result of construction. Other intersections would generally remain unchanged or experience minor downgrading in LoS.

Operational Traffic

Once operational, the project would reduce the length of highway between Toolijooa Road and Schofields Lane by approximately 1.5km and increase the average travel speed from 52km/h to 98km/h. In addition to removing conflict between local and through traffic at Berry, it is estimated that the project would result in a reduction in travel time of approximately 7 minutes.

In addition, the 'Sandtrack' is predicted to experience a significant decrease in traffic as a result of drivers taking advantage of the quicker highway times. Currently, the highway route has a travel time nearly double that of the 'Sandtrack' route to the south. The project will result in the highway having a quicker time than the 'Sandtrack' therefore removing any incentive for people to use this route.

Traffic modelling comparing a 'do nothing' approach to a 'project' scenario for the design year (2037) highlights the benefits the project will have on road network performance. **Table**

3 and **Table 4** indicate the midblock roadway level of service for both scenarios and **Table 5** indicates the intersection level of service for the 'do nothing' scenario.

Table 3 – 2037 midblock LoS project scenario

Location	Direction	Representative		Holiday peak	
		AM Peak	PM Peak	Northbound	Southbound
Princes Highway: Toolijooa Road – Tannery Road	Northbound	A	B	C	B
	Southbound	B	B	A	C
Princes Highway: Berry bypass	Northbound	A	B	C	B
	Southbound	A	A	A	C
Princes Highway: Victoria Street – South of Schofields Lane	Northbound	B	B	C	B
	Southbound	B	B	A	C
'Sandtrack': Dooley Road – Shoalhaven Heads	Two-way	C	C	C	C

Table 4 – 2037 midblock LoS 'do nothing' scenario

Location	Representative		Holiday peak	
	AM Peak	PM Peak	North bound	Southbound
Princes Highway: Toolijooa Road – Tannery Road	E	E	E	E
Princes Highway: Victoria Street – South of Schofields Lane	E	E	E	E
'Sandtrack': Dooley Road – Shoalhaven Heads	C	C	C	D

Table 5 – 2037 intersection LoS 'do nothing' scenario

Location	Holiday Peak	
	Northbound	Southbound
Princes Highway/Victoria Street		
Princes Highway northbound	A	A
Victoria Street westbound	A	A
Princes Highway southbound	A	A
Total	A	D
Queen Street (Princes Highway)/Kangaroo Valley Road		
Queen Street eastbound	A	F
Kangaroo Valley Road	F	F
Queen Street westbound	B	B
Total	C	F
Queen Street (Princes Highway)/Alexandra Street		
Queen Street eastbound	A	F
Alexandra Street southbound	F	F
Queen Street westbound	A	A
Alexandra Street northbound	F	F
Total	C	F
Queen Street (Princes Highway)/Prince Alfred Street		
Queen Street eastbound	A	F
Queen Street westbound	A	A
Prince Alfred Street northbound	F	F
Total	B	E
Queen Street (Princes Highway)/Albert Street		
Queen Street eastbound	A	F

Location	Holiday Peak	
	Northbound	Southbound
Albert Street	B	F
Queen Street westbound	B	C
Princes Highway/Tannery Road	A	E
Princess Highway/Tannery Road		
Princes Highway northbound	A	F
Princes Highway southbound	A	B
Tannery Road	A	F
Total	A	F

Note: Under the upgrade scenario, all intersection movements would be performing at LoS A, with the exception of Alexandra Street southbound which would perform at a LoS B

The above tables indicate that the “do nothing” scenario would lead to a failing road network throughout Berry with many intersections performing at a LoS level F (year 2037 in holiday peak period) if the project did not proceed. Conversely, if the project is to be constructed, all intersections would be performing at a LoS A, with the exception of Alexandra Street southbound which would perform at a LoS B.

In addition to the changes to the road network performance of Berry and the surrounding network, the project would also result in changes to property access. It is noted that the environmental assessment that was formally exhibited included the closure of Victoria Street as the preferred option. However, as a result of submissions received, the Proponent has indicated in its submissions report that the proposed option would now leave Victoria Road open and provide a two-way road between Queen Street and Victoria Street.

Generally, the project would result in an increased number of left-in and left-out movements due to the inclusion of a central median and safety barrier fencing. As such, residents of the affected streets would be required to travel along the highway until they reach a U-turn point. It is estimated that the maximum additional traffic time as a result of the project would be approximately 3 minutes. As described in the EA, the affected areas would include:

- Tindalls Lane to Austral Park Road;
- Berry (north) interchange to Tindalls Lane; and
- Schofields Lane to Berry (south) interchange.

As a consequence of submissions received during the exhibition of the EA, the Proponent refined the design of the project to include an underpass connection from Gembrook Lane to the Tindalls Lane grade-separated interchange, which would provide full access to the upgraded highway. This would reduce the additional required travel distance from up to 6 kilometres down to less than 500 metres.

Department's Consideration

Preferred Route

During the exhibition of the EA, a number of submissions were received regarding the potential for the southern option for the bypass of Berry. The nature of submissions received varied but ranged from issues such as inadequate consideration of the southern route, a preference for the implementation of the southern route, to the southern option not being preferable due to increased environmental and economic impacts.

The Department accepts the reasons provided by the Proponent for not proceeding with the southern bypass options. These include heritage impacts, increased probability of encountering soft soils and acid sulphate soils, increased flooding and surface water issues due to the alignment being located across a floodplain, a greater number of large agricultural properties would be severed and visual impacts upon the landscape due to the requirement of dominant structures, such as substantial bridging requirements.

Additionally, the Department notes the Proponent's estimate that the southern option would result in an additional expenditure of in excess of \$100 million compared to the northern bypass option. There appears to be no discernable benefit as a result of this expenditure and the Proponent is therefore warranted in its decision to pursue the northern option.

The Department is generally satisfied with the options analysis undertaken by the Proponent and notes that at this advanced stage the main role of the Department is to assess the impacts of the preferred option submitted to the Department for assessment by the Proponent. The preferred route selection is inextricably linked to all the key issues identified in this assessment report, which are considered in isolation throughout **Section 5**.

Construction Traffic

The Department concedes that short term construction impacts are generally unavoidable. Notwithstanding, the Proponent has committed to undertake reasonable and feasible measures to ensure that the construction impacts of the project are managed and mitigated to an acceptable level of impact. The Department also requires these measures be addressed via recommended conditions of approval.

The number of heavy vehicle movements on a daily average (106) or of light vehicles emanating from construction workers arriving to and leaving work (130) is not of a magnitude to suggest that there would be adverse impacts of a significant nature. **Table 6** contextualises the impact that the number of construction related vehicles would have on the overall road network by providing an analysis of the volume of traffic, per hour, for the differing intersections in 2017.

Table 6 – Approach volumes (vehicles per hour)

Location	Representative		Worst Case	
	AM Peak	PM Peak	AM Peak	PM Peak
Princess Highway/Victoria Street				
Total	1207	1329	1626	1898
Queen Street (Princes Highway)/Kangaroo Valley Road				
Total	1465	1672	1806	2015
Queen Street (Princes Highway)/Alexandra Street				
Queen Street eastbound	714	750	1178	796
Alexandra Street southbound	48	98	76	142
Queen Street westbound	620	684	445	1040
Alexandra Street northbound	33	52	119	93
Total	1415	1584	1818	2071
Queen Street (Princes Highway)/Prince Alfred Street				
Queen Street eastbound	612	682	1163	772
Queens Street westbound	650	622	447	1054
Prince Alfred Street northbound	137	210	198	214
Total	1399	1514	1808	2040
Queen Street (Princes Highway)/Albert Street				
Total	1294	1315	1825	1944
Princes highway/Tannery Road				
Total	1234	1325	1696	1933

As shown in the above table, the 236 additional traffic movements over the course of a day would have a negligible impact upon the overall number of movements. Notwithstanding, the Department recommends a number of conditions of approval requiring the preparation of a

construction traffic management plan which is to identify the local roads to be utilised and is to outline any proposed mitigation measures that may be implemented to limit impacts upon local traffic.

In relation to impacts on the 'Sandtrack' the Proponent has clarified that there will be no formal diversion in place and that the 3% estimate (additional traffic) is based on drivers decision making (based on the relationship between relative travel times and traffic distribution) rather than any formal methods such as signage. The Department notes that this is an estimate only and it is difficult to predict the increase in usage of the 'Sandtrack' when the estimate is based on driver behaviour.

In light of this unpredictability, the Proponent has agreed to install traffic counters at strategic locations to monitor changes in traffic volumes and patterns, including along the 'Sandtrack'. This will allow a dynamic approach to construction traffic management during construction. The Department has recommended a condition of approval requiring the preparation of a construction traffic management plan, which will consider this data on a regular basis (quarterly) and require construction traffic management to be modified should there be any significant deviances away from the predicted impacts/traffic volumes. The construction traffic management plan is required to be prepared in consultation with local council. Additionally, the Department has recommended a condition requiring the Proponent to prepare a dilapidation report for this route, in consultation with the relevant council, and make good any damage arising from increased use (above predicted).

The construction of this project will benefit from the majority of the works being able to occur off-line due to the upgraded highway deviating from the existing highway, which will limit the degree of impact upon the existing alignment. The Department expects that the greatest potential for impacts to the disruption of traffic during construction is the construction of the interchanges. The Department notes that there are options for the RMS to consider construction of these interchanges outside of school holiday periods and therefore avoid increased impact. The Department recommends that the staging of construction be considered and that the construction traffic management plan include details of how the staging of the project may aid in mitigating potential adverse traffic impacts.

Operational Traffic

The Department notes that the LoS (with the project) for both mid-block and intersection performance is significantly improved in the design year (2037). In particular, 56% of intersections during the south bound holiday peak would experience a level of service rating of 'F' (without the project). This scenario would place great strain on the road network, and is therefore undesirable.

Conversely, for the Princes Highway upgrade scenario (which includes the upgrade of the Princes Highway as a whole, and not just the project in isolation), the intersection performance is significantly improved with all intersections experiencing a level of service rating of 'A' (with the exception of Alexandra Street southbound which would perform at a LoS B). The Department considers that this strongly supports the justification and need for the project.

Notwithstanding the significant improvement in intersection performance, the project would result in access impacts for some residents. These access impacts would primarily affect residents located at Tindalls Lane to Austral Park Road, Berry (north) interchange to Tindalls Lane, and Schofields Lane to Berry (south) interchange. However, it is noted that the Proponent has now included an additional underpass connection from Gembrook Lane to the Tindalls Lane grade-separated interchange, which results in a significant reduction in travel distances for affected residents (from an additional 6km down to an additional 500m).

In addition to these changes, the Proponent has included a commitment to consult with affected property owners during detailed design regarding long term access requirements via underpasses.

The Department recognises that there will be unavoidable access impacts to some properties within the vicinity. However, the increased performance of the Princes Highway and the removal of most conflict between local traffic and commuting traffic is considered to outweigh the negative impacts upon local access. The Department has confidence that the access impacts will be mitigated to the greatest extent that is reasonable and feasible.

The Department is satisfied that the operation of the upgraded highway will provide significant benefits to both local traffic and vehicles utilising the upgraded highway.

5.2. Noise and Vibration

The area of the project includes a mix of land uses, including rural, rural residential and the town of Berry with residential, commercial, light industrial and recreational areas.

Construction Noise

The Proponent has undertaken an assessment of the potential construction noise impacts in accordance with the *Interim Construction Noise Guideline* (ICNG) (DECC, 2009), *Assessing Vibration: A Technical Guideline* (DEC, 2006), *Technical Basis for Guidelines to Minimise Annoyance Due to Blasting Overpressure and Ground Vibration* (ANZECC, 1990) and the *NSW Industrial Noise Policy* (EPA, 2000).

In order to establish a benchmark level of noise, monitoring was undertaken at ten locations along the alignment to determine existing background noise levels and to measure average noise levels from the existing roads. The locations were chosen as they were considered to be representative of the potential construction and noise impacts resulting from the project.

The assessment of the construction noise impacts is based on six noise catchment areas (NCA), as shown in **Figure 8**, which represent the differing background noise levels measured at each monitoring location. NCAs 1 to 4 and 6 are representative of rural and rural residential areas, whilst NCA5 covers the Berry township.

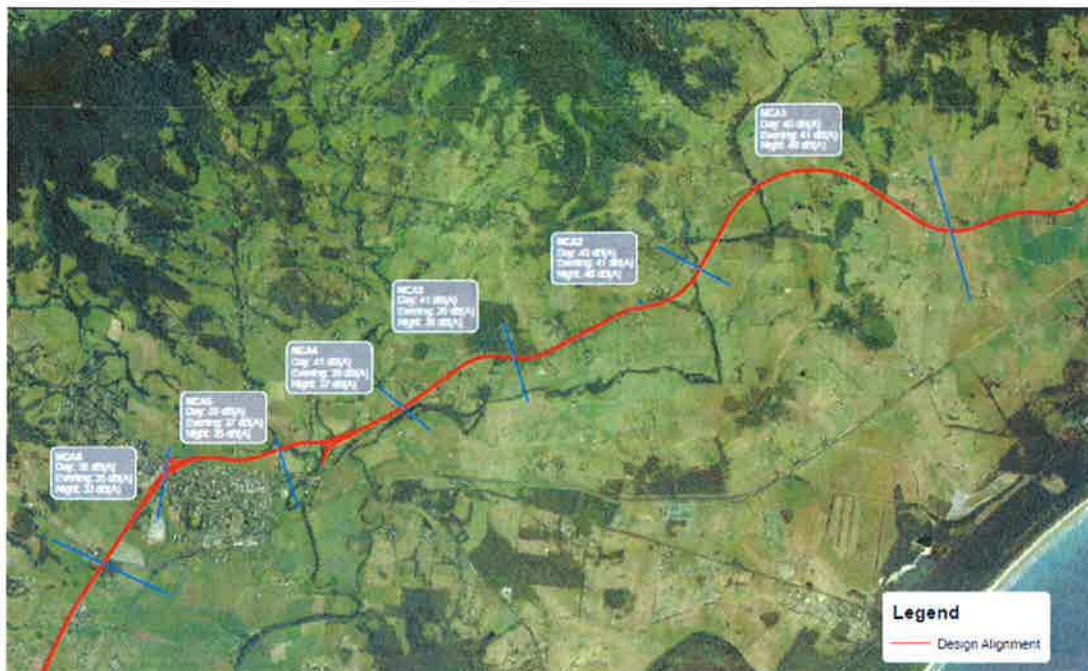


Figure 8 – Noise Catchment Areas (Source: EA 2012)

The assessment of construction noise impacts is based on the ICNG criteria. The noise management levels for residential receivers are shown in **Table 7**. In addition there are other impacted receivers including two churches located on North Street, the Berry Sportsground, Berry Riding Club and Camp Quality Memorial Park (Woodhill Mountain Road) and an aged care residential facility (BUPA) off Victoria Street, Berry. The construction noise management levels for sensitive receivers are also shown in **Table 7**.

Table 7 – Construction Noise Management Levels

Time of day	Noise Management Level
Residential	L_{Aeq} (15 mins)
Recommended standard hours: <ul style="list-style-type: none"> Monday – Friday 7am to 6pm Saturday 8am to 1pm No work on Sundays 	Noise affected RBL + 10dB
	Highly noise affected 75bB(A)
Outside recommended standard hours	Noise affected RBL +5dB
Other sensitive receivers	
Places of worship	45 dB(A) – internal
Active recreation areas	65 dB(A) – external
Passive recreation areas	60 dB(A) – external

Construction noise impacts on sensitive receivers are expected to originate from the following:

- construction activities during standard construction hours;
- extended or out-of-hours construction activities, including sleep disturbance;
- temporary construction ancillary facilities, such as stockpiling sites, site compounds;
- increased traffic noise due to construction traffic;
- blasting activities at Toolijooa Ridge; and
- cumulative noise impacts.

The Proponent differentiates between standard construction hours and extended construction hours. Standard construction hours are 7.00am - 6.00pm, Monday to Friday and 8.00am - 1.00pm Saturday, with no work on Sundays or public holidays, as recommended by the ICNG. Extended construction hours are 6.00am - 7.00am and 6.00pm - 7.00pm Monday to Friday and 1.00pm - 5.00pm on Saturdays.

The nature of construction has been divided into five main activities. The details of the different construction activities, the type of equipment and sound power levels and expected working hours are shown in **Table 8**. The construction noise modelling is based on these construction activities and typical equipment sound levels.

Table 8 – Typical construction activities, sound levels and working hours

Activity	Typical equipment used	Typical and maximum SWL ¹ dB(A)	Expected working hours
Site establishment/ landscaping	Excavators, chainsaws, mulching plant and chipper, cranes, generators, bobcat, powered hand tools, air compressor.	105-110	Standard/Extended ²
Earthworks	Road trucks, compactor, grader, multi-tyred and vibratory rollers, concrete trucks, concrete vibrator, asphalt paving plant, backhoe, sweeper, compressor, generators, rock crusher.	112-120	Standard/Extended ²
Bored piling	Bored piling rig.	100-110	Standard/extended ²
Impact piling	Impact (driven) piling rig.	124-134	Standard/extended ²
Bridge works	Piling rigs, cranes.	112-120	Standard/extended ²
Paving	Road trucks, compactor, jackhammers, multi-tyred vibratory rollers, concrete trucks, concrete vibrator, asphalt paving plant, backhoe, concrete saw, profiler, sweeper, compressor, generator.	113-118	Standard/extended ² , evening, night time

Note 1 - SWL – Sound Power Level

Note 2 – Extended hours only apply to NCA 1 - 4

Table 9 identifies the predicted noise levels for the different types of construction activities described in **Table 8**. The Proponent has made a differentiation between typical works and worst case noise impact, which takes into account high intensity and high noise generating works such as rock breaking and use of concrete saws, which are only used for a small fraction of the total construction period. It is noted that NCA5 is the most affected noise catchment due to the higher density of receivers within the Berry township.

Table 9 – Predicted construction noise levels for standard construction hours

NCA	NML dB(A)	Predicted noise level dB(A)	Typical Works Receivers exceeding NMLs	Highly noise affected	Predicted noise level dB(A)	Worst Case Receivers exceeding NMLs	Highly noise affected
Establishment and landscape works							
NCA1	50	60	3	0	65	4	0
NCA2	50	58	3	0	63	9	0
NCA3	51	51	0	0	56	2	0
NCA4	51	63	12	0	68	15	0
NCA5	45	65	150	0	70	270	0
NCA6	48	57	7	0	62	21	0
		Total	175	0	Total	321	0

NCA	NML dB(A)	Predicted noise level dB(A)	Typical Works Receivers exceeding NMLs	Highly noise affected	Predicted noise level dB(A)	Worst Case Receivers exceeding NMLs	Highly noise affected
Earthworks							
NCA1	50	67	4	0	75	12	0
NCA2	50	65	10	0	73	18	0
NCA3	51	58	4	0	66	9	0
NCA4	51	70	15	0	78	32	3
NCA5	45	72	315	0	80	456	11
NCA6	48	64	21	0	72	22	0
		Total	369	0	Total	549	14
Bored Piling							
NCA1	50	55	1	0	65	4	0
NCA2	50	53	0	0	63	9	0
NCA3	51	46	0	0	56	2	0
NCA4	51	58	4	0	68	15	0
NCA5	45	60	43	0	70	270	0
NCA6	48	52	1	0	62	21	0
		Total	49	0	Total	321	0
Impact Piling							
NCA1	50	79	16	1	89	22	3
NCA2	50	77	16	0	87	16	4
NCA3	51	70	10	0	80	14	2
NCA4	51	82	34	4	92	39	13
NCA5	45	84	457	12	94	458	95
NCA6	48	76	22	0	86	22	6
		Total	555	17	Total	571	123
Bridge Works							
NCA1	50	64	2	0	72	10	0
NCA2	50	63	6	0	71	8	0
NCA3	51	51	0	0	59	3	0
NCA4	51	72	6	0	80	28	2
NCA5	45	71	152	0	79	427	1
NCA6	48	43	0	0	51	8	0
		Total	166	0	Total	484	3
Paving							
NCA1	50	78	4	0	83	10	0
NCA2	50	73	10	0	81	16	0
NCA3	51	66	4	0	74	7	0
NCA4	51	78	15	0	86	23	0
NCA5	45	80	338	0	88	455	0
NCA6	48	72	21	0	80	21	0
		Total	392	0	Total	532	0

The above table indicates that there will be a substantial number of sensitive receivers that are predicted to receive significant construction noise impacts, both qualitative and quantitative, as a result of the construction of the project during standard construction hours. In addition, the Proponent proposes to undertake works outside of standard construction hours. These activities involve three separate categories:

- inaudible construction activities which do not require approval;
- activities undertaken during extended construction hours; and
- out of hours activities, these would be approved by the Department, with the agreement of affected receivers and the EPA.

Construction Vibration

The assessment of construction vibration impacts is based upon the *German Standard DIN 4150 – Part 3 – Structural Vibration in Buildings – Effects on Structures* (for structural damage), *Assessing Vibration: A Technical Guideline* (for human comfort/tactile vibration), and *Interim Construction Noise Guideline* (for human comfort/regenerated noise).

It is noted that there are 4 receivers which may be impacted as a result of blasting activities at Toolijooa Ridge. These receivers are located between 260m and 450m from the cutting where blasting will occur. The exact nature of the impacts is not currently known as overpressure and vibration levels are reliant on local site conditions and the charge of the blast. These conditions are not yet known, however, based on typical conditions, it is expected that compliance with the vibration limits would be achieved but airblast overpressure limits are likely to be exceeded at all 4 receivers.

Operational Noise

The assessment of operational noise impacts is based on the *Road Noise Policy* (RNP) (EPA 2011) and focuses on the day and night time noise levels for the year of opening of the project (2017) and the design year of the project (10 years after opening - 2027). Three different scenarios are considered:

- no build scenario – noise levels without the project, which takes into account the change in road noise levels that would occur due to natural traffic growth;
- build scenario – noise levels incorporating the project, including local roads, main alignment and interchanges; and
- modified build scenario – includes only the main alignment and interchanges.

The relevant noise criteria is dependent on the road category, type of road project being proposed, and the type of noise sensitive receiver that is potentially affected by the project. The new road assessment criteria are applied to sensitive receivers that would be subject to a new source of road traffic noise. A receiver is considered to be a new road noise receiver if the following applies:

- a new road where a road of the same category did not previously exist;
- a new road within an existing but previously undeveloped road corridor; and
- an alignment or realignment of a road that would produce noise at a receiver from a different direction and that increases noise levels at any exposed façade by 2dB(A) or more.

The relevant operational noise criteria for the project are listed in Table 10:

Table 10 – Road Traffic Noise Criteria

Road Category	Type of Project / Land Use	Assessment Criteria (dB(A))	
		Day (7.00am - 10.00pm)	Night (10.00pm - 7.00am)
Freeway/arterial road	New freeway/arterial road - residential	L _{Aeq} (15 hour) 55	L _{Aeq} (9 hour) 50
	Redevelopment of existing freeway/arterial road – residential	L _{Aeq} (15 hour) 60	L _{Aeq} (9 hour) 55
Local roads	New and redevelopment of local roads - residential	L _{Aeq} (15 hour) 55	L _{Aeq} (9 hour) 50
	Places of worship	L _{Aeq} (1 hour) 40	L _{Aeq} (1 hour) 40
	Open space (active)	L _{Aeq} (15 hour) 60	-
	Open space (passive)	L _{Aeq} (15 hour) 55	-

As the project includes redevelopment of the existing highway and deviations from the existing highway, the new road and redevelopment of an existing road criterion are relevant to the project.

A total of 108 receivers were predicted to exceed the appropriate noise criteria during the daytime period. Seven of these were considered to be acute noise levels (L_{Aeq} (15 hour) i.e. 65 dB(A) or greater). During the night time period, 131 receivers were predicted to exceed the appropriate noise criteria, of which 16 were considered to be acute (L_{Aeq} (9 hour) is 60dB(A)).

Department's Consideration

Some areas currently experience low levels of noise associated with their rural setting or location on the fringe of the town and others are currently exposed to high levels of noise due to their proximity to the existing Princes Highway. Depending on their location, these areas may experience an increase or decrease in existing noise levels, or would be exposed to new noise levels associated with the construction and operation of the project. As the project involves both redevelopment of the existing highway and deviations through greenfield areas (Toolijooa Ridge, the bends at Foxground and the Berry township), a number of receivers are likely to receive new noise impacts or impacts on a different façade.

Construction Noise

A number of public submissions made comments on construction noise and vibration impacts and operation of extended working hours. In addition, the EPA commented that there will be potential construction noise impacts and that these should be managed as stringently as possible.

It is important to contextualise the predicted construction noise impacts associated with the project with reference to the nature and duration of construction related activities. In the first instance, while the Proponent has predicted exceedences of construction noise objectives, these exceedences represent worst case scenarios. On average, the construction noise impacts would not be experienced continuously at these levels.

Further, it is noted that road projects are linear in nature, and involve construction activities that are largely transient and temporary in nature. No single receiver would experience maximum construction noise impacts for the duration of the construction period, and would unlikely experience elevated noise levels for the entire period. While there may be short duration high intensity noise events, such as piling and bridge construction, these events would not be an on-going issue for receivers beyond the conclusion of the construction period. The Department considers the main focus for construction noise is management, to ensure an appropriate balance between timely completion of construction works (to limit the

total duration of impacts to receivers) and the intensity of construction activities (to limit the magnitude of impacts to receivers).

The Proponent has identified 591 noise sensitive receivers within the 6 NCAs. The predicted noise impacts on these receivers during standard construction hours are shown in **Table 9**. In summary, the greatest number of sensitive receivers impacted by construction work are in NCA5, with site establishment and landscaping affecting the fewest number of receivers (175/321 typical/worst case, respectively) to bridge works, paving and impact piling, affecting the highest number of receivers. Impact piling would affect the most number of receivers (555 receivers from typical works, with an additional 17 significantly impacted as a result of worst case noise (total 571 receivers, of these a similar number of receivers within Berry (NCA5) are affected by typical/worst case noise, being 457/458 receivers, respectively). The noise assessment states that the use of bored piling instead of impact piling would reduce the number of impacted receivers to 49 from typical works and 321 receivers from worst case noise. The Proponent would utilise bored piling where possible to reduce noise impacts.

The Proponent recognises the significant construction noise impacts of the project and would prepare and implement a Construction Noise and Vibration Management Plan (CNVMP) to provide details of best practice construction methods to address/ manage construction noise and vibration impacts. The CNVMP would present a feasible and reasonable approach to the management and mitigation of construction impacts. The Proponent has also committed to a detailed community relations program to notify and consult with the community on upcoming noisy activities or out of hours work, and implement a complaints response procedure.

The Department notes that predicted noise levels from impact piling activities are significant, exceeding the highly noise affected criteria (75 dB(A) at 5 of the 6 NCAs for typical works and at all NCAs for worst case noise levels, during the standard construction hours. The exceedances of the construction noise management levels for typical works range from 19 to 31 dB(A) for the northern NCAs to 39dB(A) for NCA5. Worst case noise levels are between 39 to 49dB(A) above the noise management levels, affecting 557 receivers, of which 121 are predicted to receive noise levels above the highly noise affected criteria (75dB(A)), to a maximum of 94dB(A) in NCA5. The Proponent acknowledges impact piling is noise intrusive and has indicated that possible measures to reduce noise levels include screen drop hammer driver for sheet piling (20dB(A) reduction) and resilient pad between the pile and hammerhead for a 10dB(A) noise reduction. In addition the Proponent would implement respite periods into the construction program. The Department notes that the Proponent has committed to restrict impact piling, where required, to standard construction hours (Statement of Commitment NV2) and that bored piling would be used where conditions allow. To ensure that respite is given to affected receivers, the Department has recommended a condition of approval which restricts high noise impact activities (such as piling) to the hours of 8.00am to 6.00pm Monday to Friday and 8.00am to 1.00pm on Saturdays, and in continuous blocks of no more than 3 hours, with a minimum 1 hour respite period between blocks.

The Department is satisfied that construction noise impacts can be appropriately managed through the implementation of mitigation and management measures, which the Proponent has made a commitment to implement. The Department accepts that it would be difficult, if not impossible, for the Proponent to satisfy the relevant noise criteria during certain construction activities. However, given that the project is linear infrastructure, the temporary nature of construction impacts and the benefits to the community of the project, high construction noise impacts are unavoidable. Accordingly, the Department has recommended as a condition of approval the requirement that the Proponent prepares and implement a CNVMP, which would detail how construction and vibration impacts would be minimised and managed. Examples of potential noise management measures include the timing of certain

types of construction processes, the maintenance of machinery, ongoing consultation with affected receivers and constructively responding to noise complaints.

The EA identified 9 potential ancillary facility locations, however, the Department has not been able to finalise its assessment of the potential noise impacts on nearby sensitive receivers as no detail has been provided on the proposed use of each of the facilities or their final layout/location. In addition, the size of several facilities has changed. As the Department is not able to assess the certainty of impacts on receivers, it is recommended that the location of ancillary facilities be subject to the criteria in the proposed condition of approval for ancillary facilities (i.e. facilities that do not meet the criteria require the approval of the Director General, subject to an appropriate environmental assessment of the proposed facility). Further discussion on ancillary facilities is provided in **Section 5.6**.

Construction Hours

The Proponent has sought approval for extended construction hours (an additional hour at the beginning and end of the day, Monday to Friday, and extension of Saturday afternoon work from 1.00pm - 5.00pm) beyond the standard construction hours typically applied to infrastructure projects under the ICNG. An assessment of morning shoulder works (6.00am - 7.00am) was undertaken for the project area to the north of Berry township, between Toolijooa Road and Tindalls Lane, within NCAs 1 to 3. An assessment of NCA4 was also undertaken as extended hours may include bridge works in NCA3, which would be audible in NCA4.

The noise assessment predicted 31/45 receivers respectively, would be impacted from typical/worst case works during site establishment and landscaping, 61-66/90-89 receivers respectively during paving and bridge works, to 91 receivers during impact piling. The exceedances of the noise management levels in NCAs 1-3 range from 15 to 20dB(A) for site establishment and landscaping, 22 to 30 dB(A) for earthworks, 10 to 20dB(A) for bored piling, 19 to 32dB(A) for bridge works and 33 to 38dB(A) for paving works. The predicted noise exceedances in NCA4 are higher for each of the above construction activities. Based on this assessment, the Proponent proposes the following extended hours:

- 6.00am to 7.00pm Monday to Friday for the Toolijooa cut, Broughton Creek floodplain and major bridge works (outside Berry);
- 8.00am to 5.00pm Saturdays for the Toolijooa cut, Broughton Creek floodplain and major bridge works (outside Berry); and
- outside of known major traffic peaks (such as the Friday evening prior to a public holiday long weekend).

In addition, the Proponent proposes to undertake low noise impact activities during the morning extended work period (6.00am - 7.00am), such as deliveries, site access, refuelling, office works, foot based activities and work in ancillary activities.

The Proponent states that the extension of the working hours at the beginning and end of the working day and on Saturday afternoons is in the public interest as it would:

- shorten the construction period by approximately 3 months or 10%, which would minimise the disruption to highway traffic and local businesses;
- replace a substandard and inefficient road sooner and reduce the potential for crashes; and
- potentially reduce the overall cost of construction.

The Department considers that noise impacts of extended hours are significant, particularly on receivers in NCA4 from works occurring in NCA3. The ICNG permits works to be undertaken outside normal construction hours in certain circumstances, including public infrastructure works that shorten the length of the project (construction duration) and are supported by the community. To address this requirement, the Proponent advised that it undertook consultation with affected receivers within the extended hours area by letter (all 49

privately owned properties), by telephone (44 properties), and/or face to face consultation meetings (34 properties). The Proponent states that the majority of the consultation meetings were generally supportive of extended construction hours. Three property owners expressed concerns about extensions to the morning and evening periods, and one property owner was concerned about work on Saturday afternoons.

The Department considers that the consultation undertaken with affected landowners does not satisfactorily address the ICNG's consultation requirement. The Proponent's consultation was restricted to the 49 affected landowners in NCA 1- 3 and did not specifically include details of proposed extended hours activities, predicted noise impacts and proposed mitigation measures. Furthermore, the department notes that the consultation did not include potentially impacted receivers in NCA4, which the noise assessment predicted would be significantly impacted. Although the Proponent has committed to not undertake impact piling during extended hours and that operation of extended hours would be undertaken in consultation with the EPA, the department considers that the Proponent has not sufficiently addressed the ICNG requirement for broad community support and that there are significant exceedances of the noise management levels, including levels that are close to and above the highly affected noise level of 75dB(A).

The department acknowledges the benefits that flexibility to construction hours could have for the expeditious completion of the construction of the project and accepts the Proponent's restriction of extended hours to NCAs 1 to 4 for certain activities within this area (Toolijoola cut and Broughton Creek floodplain and major bridge works outside Berry). The Department supports the proposal for low noise impact activities during the morning shoulder period (6.00am - 7.00am), however, an extension of hours for general construction activities is not supported. The Proponent would need to undertake further assessment of the impact of general construction activities, including consultation with affected receivers in accordance with the ICNG. Accordingly, the Department has recommended a condition of approval which permits low noise impact activities between 6.00am and 7.00am and 6.00pm and 7.00pm (Monday to Friday) and from 1.00pm to 5.00pm on Saturdays.

It is noted that extended construction hours is different to out of hours work, which is usually undertaken on a case by case basis where works must be completed once commenced, or for technical reasons (such as paving, concrete saw cutting), or to minimise impacts on traffic movement and safety along the existing highway (particularly in the sections of the highway that is being redeveloped), or for traffic switches. A separate approval process for out of hours work is provided in the recommended conditions of approval.

Construction Vibration

The construction vibration assessment considered impacts from vibration intensive plant such as vibratory rollers and hydraulic hammers, and blasting. The assessment recommended safe working distances for such plant and considered that compliance with these distances would mean that no further vibration mitigation is required. However, where operation at the safe working distances cannot be avoided, a range of measures would be implemented, including monitoring of vibration levels and real-time warning to operators that cosmetic damage levels are being approached.

The Department notes that the excavation of the Toolijoola Ridge cutting would require blasting. The vibration assessment predicted compliance with the vibration levels, however, exceedances of the airblast overpressure limit are predicted to occur. The Proponent expects, as the cut deepens, that larger blast sizes would be able to be used as noise levels (airblast overpressure) would be attenuated by the cutting itself. The assessment identified 4 sensitive receivers within 260m - 450m of the blast site.

The Proponent proposes to increase the peak particle vibration (PPV) level and airblast overpressure level above the EPA's recommended limits with the written consent of property

owners. The ability to use larger blast sizes would improve blasting productivity and reduce the number of blasts and the duration of construction of the Toolijooa cutting and project overall.

The Department is satisfied that the potential vibration impacts can be appropriately managed through the CNVMP, and blasting impacts through a Blast Management Plan. The department notes that higher blasting limits (PPV and airblast overpressure) have been approved for a number of Pacific Highway Upgrade projects (such as Banora Point, Tintenbar to Ewingsdale, Kempsey Bypass and Sapphire to Woolgoolga). In all cases, the Proponent is required to obtain the approval of the property owner to undertake blasting at higher limits, and where there are unresolved complaints, the Proponent is required to comply with the lower blasting limits. The Department recommends similar requirements for the project and has recommended conditions of approval that provide for higher blasting limits with the approval of the Director General. In obtaining the Director General's approval, the agreement of the property owner and the EPA must be obtained and the details of the blasting program provided, including the implementation of feasible and reasonable mitigation measures.

Operational Noise

A number of submissions commented on operational noise impacts including concerns with general noise impacts due to the proximity of the project to the Berry township, sleep disturbance, impacts upon the equestrian centre, noise attenuation measures and the accuracy of background noise modelling.

The operational traffic assessment identified 164 receivers as exceeding the appropriate noise criteria. The majority of the exceedances are located in Berry township near the new road alignment (in the vicinity of North Street, Kangaroo Valley Road, Huntingdale Park Road). Under the RNP residential and non-residential uses that exceed the traffic noise criteria require noise mitigation. The Proponent's consideration of noise mitigation measures has been guided by the Roads and Traffic Authority's *Environmental Noise Management Manual* (ENMM) (2001). The ENMM requires mitigation where predicted noise levels are acute ($L_{Aeq}(15 \text{ hour})$ 65dB(A) and $L_{Aeq}(9 \text{ hour})$ 60dB(A)), and in relation to a redeveloped road, where increases in noise levels are greater than 2dB(A). The RNP and ENMM consider that noise increases up to 2dB(A) are barely perceptible to the average person and therefore considered to be minor and the provision noise mitigation is not required. Taking this into consideration, the number of sensitive receivers requiring noise mitigation reduces from 164 to 114.

The provision of low noise pavements (stone mastic asphalt) along the entire alignment and 4m high noise barriers along the southern side of the alignment (North Street) and the Kangaroo Valley Road northbound off-ramp (**Figure 9**) would reduce the number of noise affected receivers from 114 to 20. The Proponent states that it is not feasible and reasonable to provide noise barriers to isolated receivers or receivers in groups of three or less. The preferred noise mitigation for such receivers is the provision of architectural treatment to the dwelling. The Proponent states that the provision of measures such as fresh air ventilation, sealing of wall vents and upgraded window and door seals could achieve reductions in noise levels of up to 10dB(A). The 20 remaining receivers that are significantly affected by road traffic noise would be offered architectural treatment to address residual traffic noise impacts.

Residents in North Street have raised concerns about the height of noise barriers obstructing existing views from the town to the north. The mitigation measures assessed under the ENMM for North Street were low noise pavement and a 3m high noise barrier, resulting in 13 receivers requiring architectural treatment to comply with the noise criteria. The Proponent has noted the community's desire to maintain existing views and would consult with the community following detailed design, to determine whether they prefer a 4m noise barrier

that would provide noise mitigation or a noise barrier one metre shorter but with an indiscernible increase in noise.

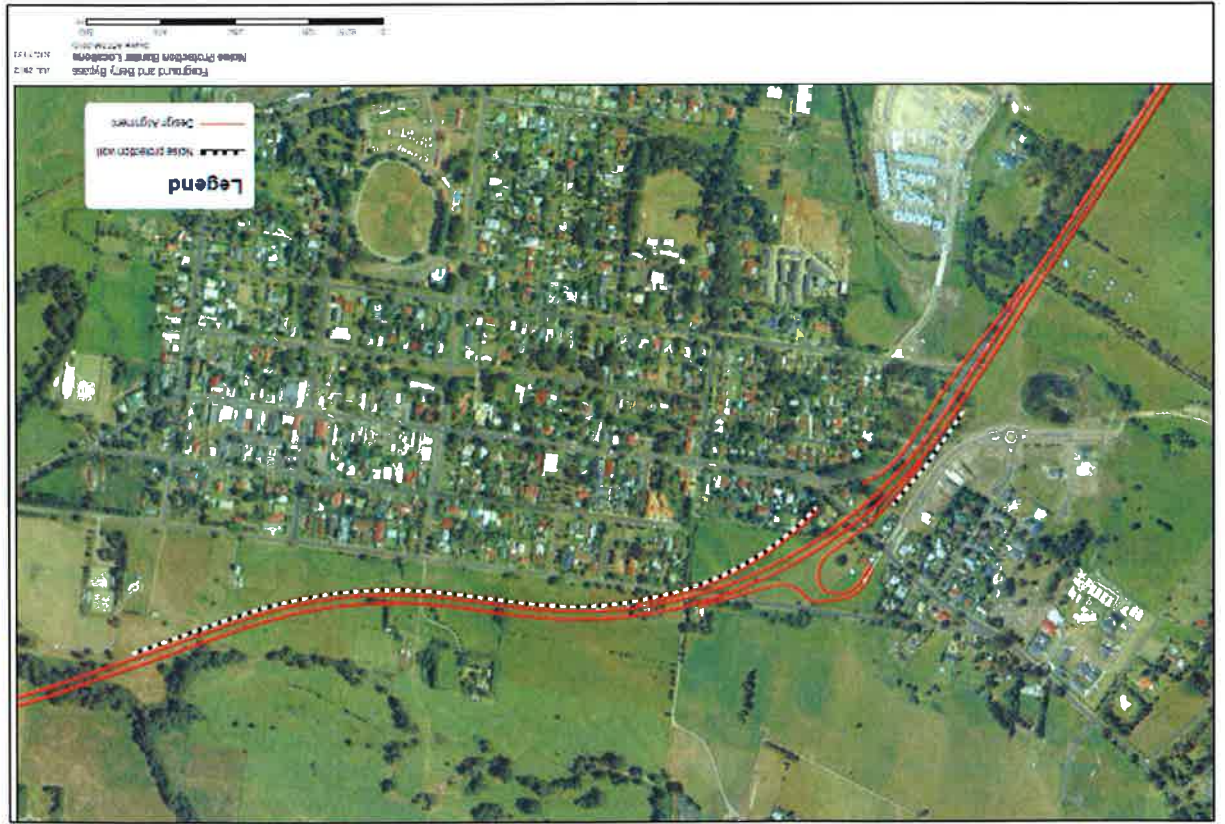


Figure 9 – Location of Noise Barriers

In relation to non-residential land uses, the assessment considered that it was feasible but not reasonable to provide measures to mitigate the 5dB(A) exceedance of the passive recreation criteria for the Mark Radium Park. The ENMM recommends buffer zones as the primary mitigation measure for recreation areas. Therefore additional noise mitigation is not recommended for Mark Radium Park.

With the provision of low noise pavement and noise barriers in the North Street area, compliance with the noise criteria is achieved for the Camp Quality Memorial Park, Berry, Uniting Church and Saint Patrick's Catholic Church.

Although the night time noise criteria (55 dB(A)) is exceeded at the BUPA Care Services Aged Care Facility (predicted noise level of 56dB(A)), the exceedance is within the 2dB(A) allowance and therefore noise mitigation is not required.

The Department is satisfied all feasible and reasonable noise mitigation measures have been considered for the project in accordance with the RNP and the ENMM. Further work will be undertaken by the Proponent at the detailed design and implementation stages of the project to select the appropriate mitigation measures. The Department considers it appropriate, therefore, to recommend conditions of approval requiring the Proponent to submit to the department a review of the operational noise mitigation measures for the project within six months of the commencement of construction. The purpose of the review is to confirm the suitability of the mitigation measures to comply with the traffic noise criteria, and where necessary, undertake further investigation of additional feasible and reasonable measures. In addition, the department recommends a condition of approval requiring noise auditing to be undertaken within one year of the commencement of operation. The noise audit would include a noise monitoring program to assess compliance with the predicted noise levels and any additional noise mitigation measures that may be required to address non-compliances.

Subject to the commitments undertaken by the Proponent and the recommended conditions of approval, the Department is satisfied that the project would be able to be constructed and operated in a manner which minimises noise and vibration impacts on sensitive receivers.

5.3. Flooding and Hydrology

Flooding

The Proponent has undertaken hydrologic and hydraulic modelling to understand the existing and proposed flood behaviours of the locality and also the extent of flooding in the creeks and waterways traversed by the project. The study area comprises the following main creeks (plus a number of unnamed tributaries), some of which overtop the existing highway in a 2 year ARI and all of which overtop the existing highway in a 100 year ARI:

- Broughton Creek;
- Connollys Creek / Bundewallah Creek / Broughton Mill Creek Town Creek; and
- Hitchcocks Lane Creek.

The project includes a diversion of Town Creek and 3 crossings of Broughton Creek, and 1 crossing at Connollys Creek / Bundewallah Creek / Broughton Mill Creek.

The proposed bridges have been designed to ensure piers are located outside Broughton Creek, however due to aesthetic requirements to minimise and mitigate visual impacts of the main bridge at Berry, some piers may be located within Bundewallah Creek.

Town Creek is a small ephemeral watercourse, that flows into Berry from the west before running through the Berry township in both open and covered channels and joins Broughton Mill Creek to the south east of Berry. In heavy rainfall events, Town Creek causes flash flooding within Berry. The proposed diversion would result in 400m of new open channel being constructed to join Bundewallah Creek. Upstream of North Street, where the diversion is proposed, vegetation is primarily grazing lands. Downstream of North Street, where Town Creek becomes an urban channel, the vegetation is 'highly degraded' comprising mainly exotic species. The diversion would minimise flash flooding impacts to residents of Berry, by reducing the size of the catchment area.

A total of 11 properties (dwellings/buildings) have been identified as being potentially impacted by changes in flood levels (100 year ARI) as a result of the project. Of these, 5 properties would experience a reduction in freeboard (floor level in relation to flood level) by between 0.03m and 0.08m, 5 properties already flood affected would experience increases in flood levels by 0.03m or less, and 1 property (amenities building at the Berry Sportsground and the Camp Quality Memorial Park) would experience negligible or minor increases in flood levels. Impacts as a result of more frequent flood events would be of smaller magnitude than those described above.

Groundwater

The Proponent has stated that the proposal is likely to impact on groundwater during construction as a result of changes to flow and sub-surface behaviour, particularly where deep excavations and cuttings are proposed. Some temporary localised dewatering may also be required during the construction of bridges and other major structures, and to maintain dry working conditions.

The Proponent indicates that there is a low risk that potential acid sulphate soils may be present along the project, which could result in groundwater degradation. The Proponent has also indicated that construction activities, including fuel and chemical spills (such as petrol, diesel, hydraulic fluids, lubricants and explosive residues), may impact on groundwater and groundwater dependent ecosystems (GDE). The increase in hard road surface areas would alter groundwater behaviour, due to the loss of permeability. Additionally, run off from

construction areas may be highly turbid, and road runoff during operation could contain pollutants associated with vehicular movements (such as leaks, spills and crashes), both of which may potentially influence groundwater quality.

There are no drinking water catchments within the project area, and additional geotechnical investigations would be undertaken during the detailed design stage to ascertain what impacts (if any) are likely to the 16 registered bores within 500m of the project alignment. Additionally, the Proponent has also committed to undertake additional geotechnical investigations to determine the need and volumes of dewatering, impacts on drawdown and the quality of groundwater. The Proponent has also committed to implementing a range of management and mitigation measures to minimise groundwater impacts during construction and operation of the proposal. The measures include the preparation and implementation of an Acid Sulphate Management Plan, a Groundwater Management Program, communications procedure, and a Groundwater Management Plan.

Department's Consideration

Flooding

In relation to construction impacts, drainage structures such as culverts will be located and aligned to follow natural drainage lines and sized to accommodate anticipated water flows from major rainfall events. Scour protection is to be provided in the vicinity of culvert discharge points to minimise bank and landscape erosion. The Department is satisfied that flooding impacts as well as erosion and sediment control during the construction stage have been adequately considered and that the project is likely to have minimal impact on flooding and surface water quality.

With regards to operational impacts, the Department notes that the project is predicted to have a minor increase in flood levels to some properties in Berry, and minor increases (up to 0.3m) in flood depths and velocities in the Broughton Creek floodplain, however no impacts to structures or accesses are anticipated to these agricultural lands. The diversion of Town Creek would provide flood relief to a number of properties within Berry due to a reduction in flood levels by up to 0.9m (**Figure 10**). Overall, 113 properties within Berry would experience reduced flooding in the 100 year ARI, 9 of which would no longer experience above floor inundation. Some improvements to access would also be experienced, including the south coast rail line.

The Department notes the design of the Town Creek diversion would be a relatively straight channel to minimise the amount of private land that is impacted, and to ensure ongoing use of the agricultural land in its existing capacity. Additionally, bank gradients would be designed to take into account erosion, grazing and access requirements with vegetation being the preferred method of batter/bank treatment. NOW has raised concern over the design of the 400m diversion proposed, and requested the creek be rehabilitated to replicate a natural stream shape. The Department however understands that the Proponent would not be acquiring the land on which the diversion is proposed and raises concerns in relation to ongoing maintenance of the channel given the relatively small catchment and ephemeral nature of the creek. On balance, the Department considers the diversion to be satisfactory from a property impact and flooding perspective. Appropriate conditions relating to the detailed design of the diversion have been included in the requirement to prepare and submit for the approval of the Director General, an Urban Design and Landscape Management Plan.

The Department acknowledges the Proponent's commitment to implement appropriate measures in consultation with affected landowners to minimise predicted flooding impacts on property/stock, and provide scour protection of bridge piers and abutments to minimise any impacts due to increased flow velocities.

The Department is satisfied the project would result in a net benefit in terms of the flood risk in Berry and the surrounding area, primarily due to the diversion of Town Creek, and

recommends conditions that require the Proponent to design the project to maintain existing hydrological characteristics to the greatest extent possible and to consult with landowners on the implementation of flood mitigation measures.

Groundwater

The Department acknowledges the Proponent's assessment of groundwater and groundwater related impacts, particularly those in the vicinity of the proposed cutting at Toolijooa Ridge, and the riparian vegetation along Broughton Creek. The Department understands that impacts to GDEs would be minor and localised and as such would not be unreasonably impacted by the project, especially those at elevated parts of the catchment. While registered bores in the vicinity of Toolijooa Ridge are not expected to be adversely impacted due to the distance from the cutting, additional geotechnical tests would be undertaken to better understand impacts during the detailed design stage.

The Department notes the proposed management and mitigation measures to address potential construction and operational ground water impacts and considers further investigation is required given that short and long term impacts are likely. Accordingly, a condition has been recommended requiring the Proponent to provide details on the management of groundwater levels, quality and flow during the construction of the project in the Construction Soil and Water Management Plan to ensure impacts on water quality and resources are minimised and mitigated where adverse impacts arise. The recommended conditions require the Plan to be developed in consultation with the OEH, NOW and DPI and include:

- details on the management of groundwater level, quality and flow;
- impacts on springs, groundwater seepage, aquifer compaction and salinity;
- identification of mitigation and monitoring measures;
- a groundwater management strategy, including consideration of risks on GDEs; and
- a contingency plan to deal with the unexpected discovery of Acid Sulfate Soils.

The Department considers that the proposed commitments and conditions of approval would ensure that potential impacts on groundwater can be appropriately managed.

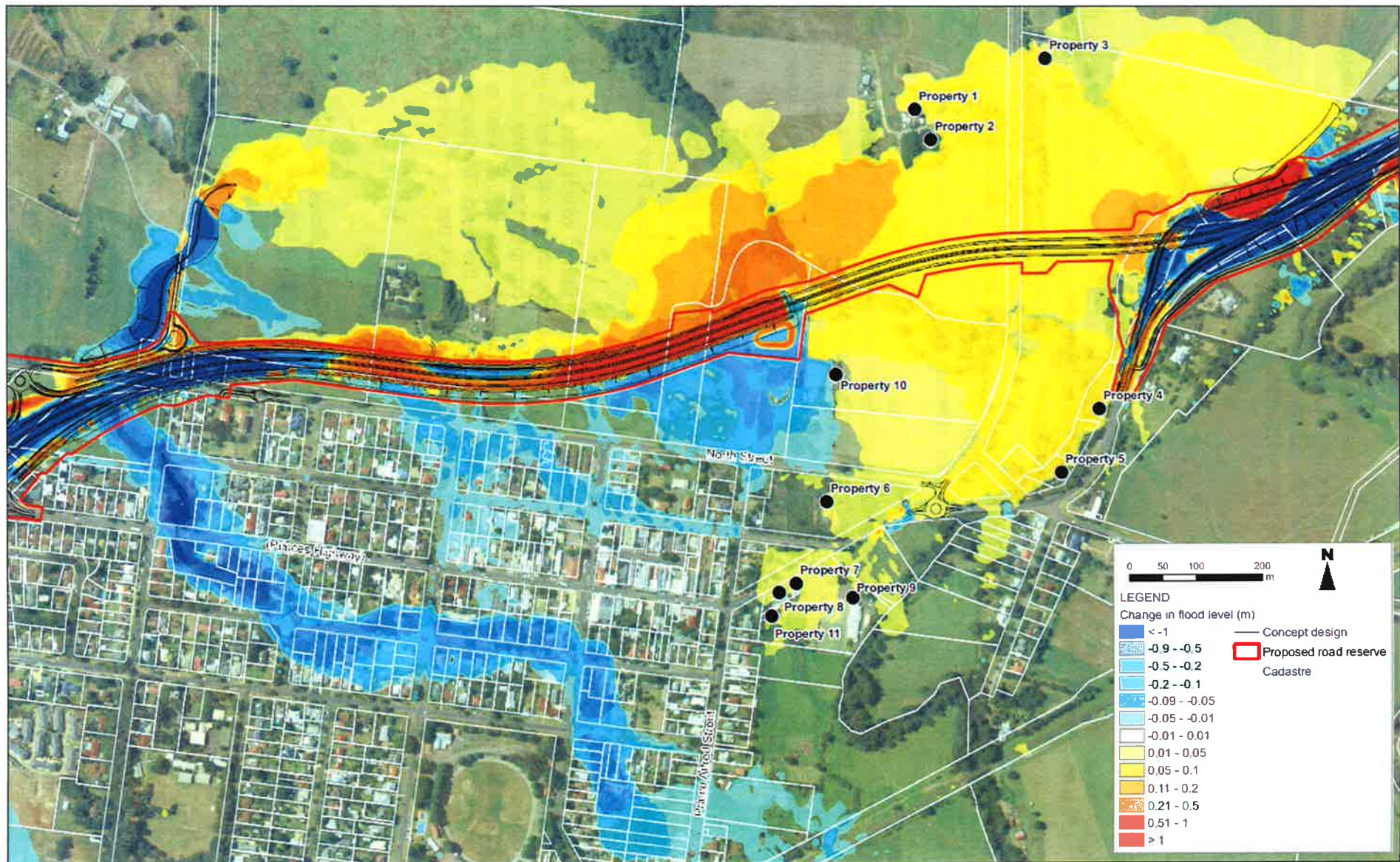


Figure 10 Predicted changes in flood levels as a result of the project (Base Image Source: EA).

5.4. Urban Design

The Proponent has prepared an Urban Design and Landscape Character and Visual Amenity assessment, which explains how the study area was broken down into four character units, enabling greater focus on these four distinct landscape types. These character units illustrate the various existing landscape environments along the project corridor. These character units (Refer **Figure 11**) are:

- Toolijooa Ridge;
- Broughton Creek;
- North Berry; and
- Berry.

Toolijooa Ridge is considered to be the most significant landscape in the study area, due to its visual prominence and its function as part of an identified wildlife corridor. Clusters of trees are scattered around the ridgeline that are separated by pasture grasses and rural residences. Rural views to the north, south and west can be enjoyed from the ridge. The project proposes a bypass of the bends at Foxground and a substantial cut through this ridgeline approximately 26m deep and 900m in length. Due to the relatively steep grades, a third lane (climbing lane) would ensure slower and/or heavier vehicles ascend/descend Toolijooa Ridge safely.

The main feature of the *Broughton Creek* character unit is Broughton Creek, which meanders through the pasturelands and floodplain environment of Broughton Valley. Narrow strips of riparian vegetation exist along both banks of the majority of this section of Broughton Creek, reinforcing the significance of this character unit. The project proposes three separate bridges across Broughton Creek and a large embankment across the floodplain.

The *North Berry* character unit comprises pockets of closed forest, open pastureland and small relatively steep ridgelines that are both traversed and straddled by the existing highway. Views can be enjoyed to the west, south and east, particularly on the approach to Berry from the north. The project proposes interchanges at Austral Park Road and Tindalls Lane, and many small sections of cut and fill slopes.

The *Berry* character unit comprises the township of Berry, which has a strong urban presence with defined boundaries, contrasting to the surrounding pasturelands and similar to many small rural townships in regional NSW. Berry is a compact township, with streets laid out in a traditional grid-like fashion. The primary growth area to the west is less formal, responding appropriately to the undulating topography of the land. The escarpment to the north and west is a significant focal point from Berry, as are the rural views to the north, south, east and west.

The project proposes to bypass Berry to the north and includes:

- interchanges to the east and west;
- a bridge across Broughton Mill Creek, Woodhill Mountain Road, Bundewallah Creek;
- the diversion of Town Creek to connect into Bundewallah Creek;
- modifications to local roads/accesses;
- noise walls;
- a variable message sign to the west; and
- public open space along North Street.

Berry comprises a number of constraints and opportunities (Refer **Figure 12**) and can be further broken down into four character sub-units: the bridge and interchange north of Berry; the North Street corridor; and the Kangaroo Valley Road interchange to the west of Berry.

The interchange northeast of Berry would be situated to the east of Broughton Mill Creek, providing access to the old Highway and Berry. From the interchange, a 19 span concrete bridge measuring approximately 600m in length and approximately 12m in height would provide flood free access to the North Street corridor.

North Street is the northern-most extremity of the established Berry township, serving as the interface between the urban environment of Berry and the rural landscapes that surround the township. The main focal point of this corridor is the escarpment to the north, which serves as a backdrop to the pasturelands in the foreground.

The Kangaroo Valley Road interchange would be located between the established Berry township, and the relatively newer housing areas/growth areas to the west of Berry and as such, would have the most urban of the design treatments proposed.

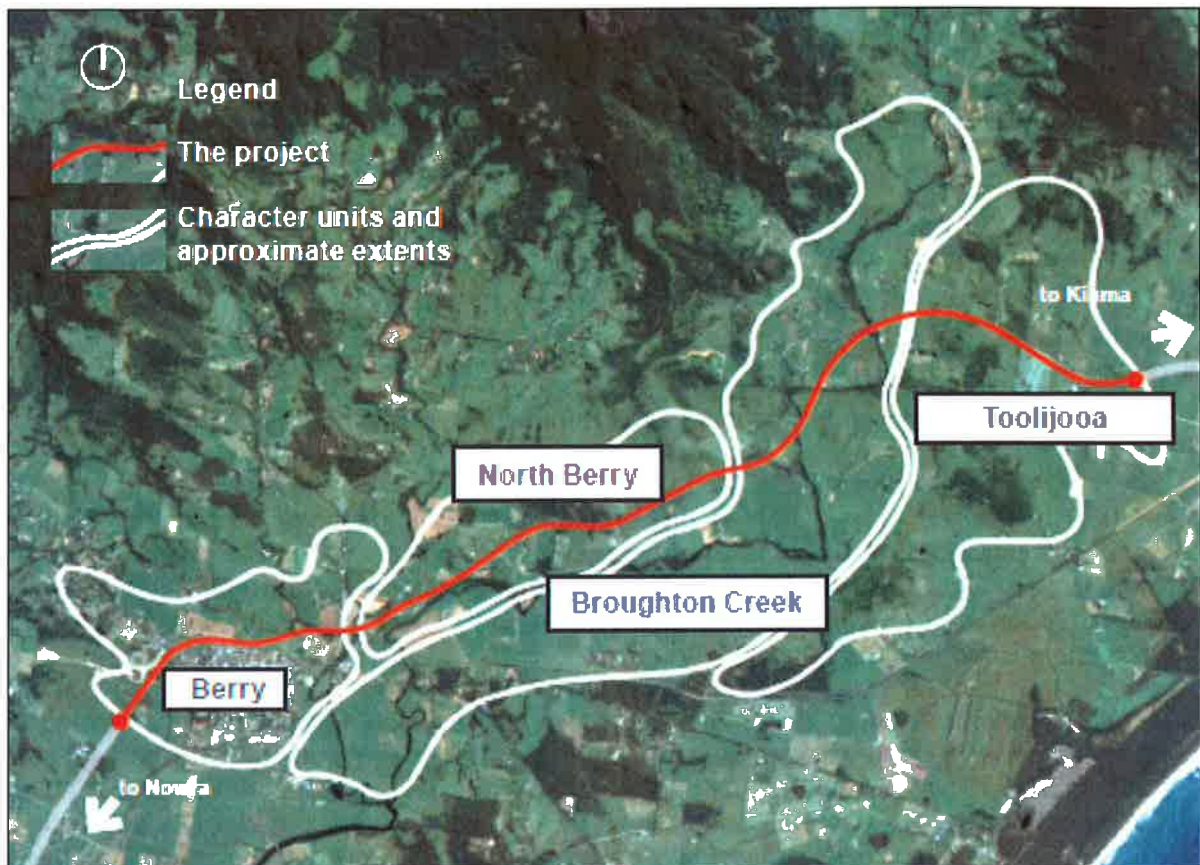


Figure 11 Main character units (Base Image Source: EA)

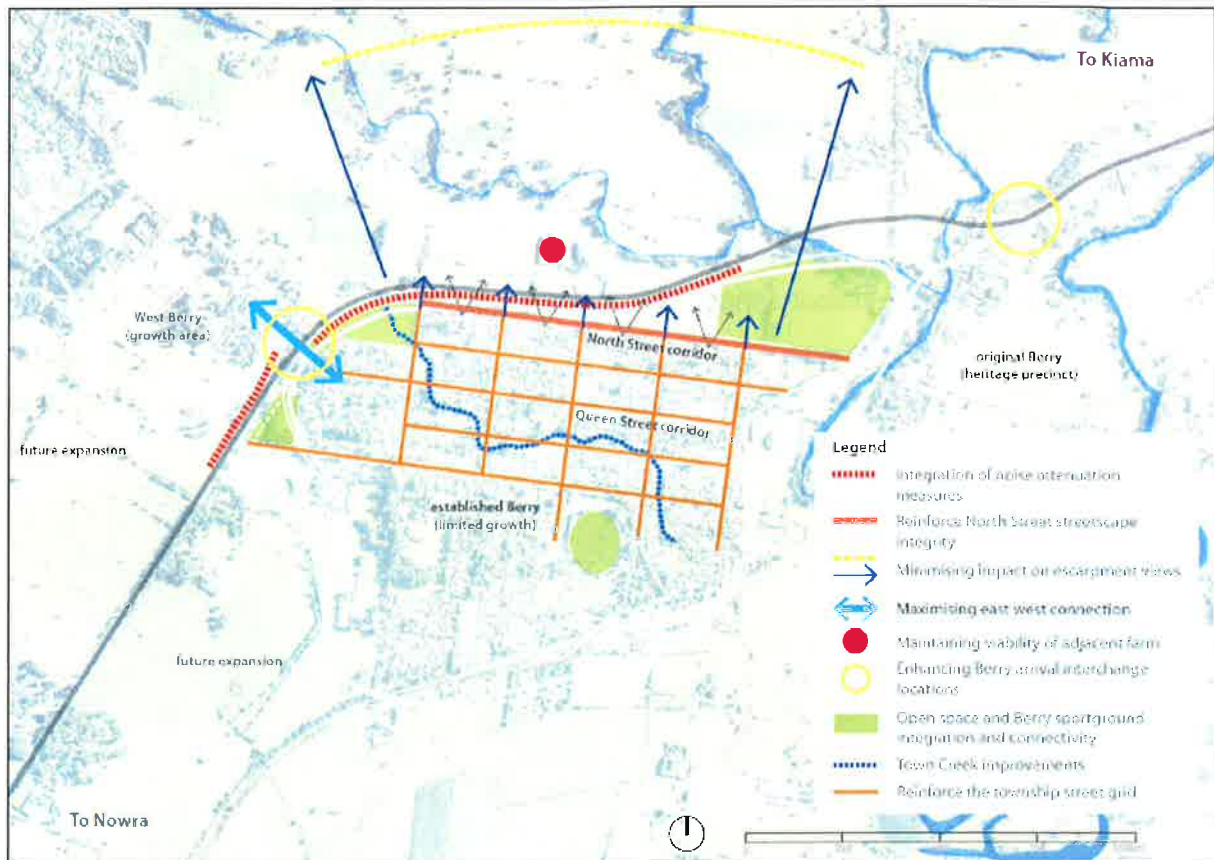


Figure 12 Key design constraints and opportunities in Berry (Base Image Source: EA)

Department's Consideration

While the project area traverses predominately rural landscapes comprising pasturelands and some pockets of intact forest and ribbons of riparian vegetation along creek lines, it would also result in a visual impact as it bypasses the township of Berry, particularly with the construction of two interchanges and large bridge over Broughton Mill Creek, Woodhill Mountain Road and Bundewallah Creek.

The Department appreciates that views towards Toolijooa Ridge will be impacted by the project, particularly views from the west and north, due to the scale of the proposed cutting in this location. This ridgeline is an important landscape feature from both a visual and cultural perspective given its past use and present day role as a wildlife corridor (Refer **Section 5.6**). A number of design elements would be employed by the Proponent to lessen the visual impacts and ensure this highly visible cutting is as sensitive as possible to the surrounding open landscape. It is considered that these measures, which would include steep rock batters as the base of the cutting, consistent benching parallel with the vertical geometry of the proposed highway, rolling out of the top of the cutting to enable re-establishment of pasture grasses and tree planting (to assist with fauna corridor connectivity), would effectively minimise the visual impact of the project and ensure a satisfactory integration within this character unit (Unit).

With regards to the *Broughton Creek* and *North Berry* units, the Department considers that a widened project footprint to allow the flattening of embankments, which will be returned to pastureland following construction, is a good visual and design outcome in keeping with the 'before' project nature of the landscape. Additional plantings of Eucalypt and riparian vegetation will also enhance the local environment.

Of the three bridges proposed across Broughton Creek, the third bridge (Refer **Figure 4**) is considered to provide the greatest visual impact, particularly when viewed from residences in

the vicinity. The Department notes that a minimalist bridge design has been employed in this location together with supplementary plantings of the southern bridge abutment to lessen its visual impact. The creek line vegetation would also be reinstated in this location. The Department acknowledges that this bridge would be visually dominating for nearby residences, particularly the residence in the valley (RMB 353 Princes Highway, Broughton Village) which backs onto the bridge and piers, and notes the Proponent's proposed mitigation and management measures for this locality also includes consultation with the property owner and possible relocation of the residence. Even though the bridge has been designed to minimise the visual dominance, a condition is recommended requiring the Proponent to ensure the pier design and location minimises visual impacts.

The Department notes that two interchanges, in particular the Kangaroo Valley Road interchange (Refer **Figure 4**) would have the potential to be visually intrusive when viewed from Berry and west Berry, given the increased proportion of hard surfaces compared to soft landscape treatments. The increased hard surface areas of the Kangaroo Valley Road interchange can also be attributed to the shared pathways proposed to maintain connectivity for pedestrians and cyclists between Berry and the growth areas to the west. The Department considers this an important aspect of the interchange design, and notes the detailed design provided by the Proponent for various landscape treatments. The Department also considers that the design treatments proposed, both hard and soft landscape elements (including deciduous feature plantings), would provide an identity to the gateways for Berry. A combination of the natural topography and small cuttings for the main carriageways in this location would also assist in lessening the perceived bulk of this interchange.

The section of proposed highway between the two interchanges is considered by the Department to be the most important section of highway in urban design terms. This is due to the length of the proposed bridge across Broughton Mill Creek, Woodhill Mountain Road and Bundewallah Creek (600m in length and 12m in height), the importance of the views enjoyed towards the escarpment from the North Street corridor, and the location of the recreational areas (Berry Riding Club, skate park and cricket oval). As the proposed bridge will be one of the most visually intrusive design elements, the Proponent has undertaken an options analysis for the pier and headstock design. The Department considers the chosen design to be appropriate given its context. Also, supplementary planting of Poplar trees along Woodhill Mountain Road will enhance the existing local heritage listed row which exists on the eastern side of Woodhill Mountain Road between the existing highway and Bundewallah Creek, and other younger Poplar trees (not heritage listed) along Woodhill Mountain Road.

Due to the importance of the views towards the escarpment, and the route refinement process which resulted in a greater buffer area between the existing North Street and the proposed highway, the Department notes the level of detailed landscape design work that has been undertaken by the Proponent to date. The key features of this section of upgrade are a vegetated earth embankment with a possible noise attenuation wall on top, a shared pedestrian/cycle path running the entire length of North Street and the relocation/reconfiguration of the Berry Riding Club. The Department concurs with the Proponent's arguments, concluding that views to the escarpment from North Street would be maintained. The Department also acknowledges that, due to the difference in level between the proposed highway, existing ground level and the proposed vegetated earth embankment, the majority of the rural outlook would be maintained. This is clearly demonstrated in **Figure 12** and **Figure 13**.



Figure 13 Existing (top) views from North Street towards proposed highway and artists impression (bottom) illustrating proposed shared pedestrian/cycle path and noise attenuation/visual screening treatments (Source: EA).

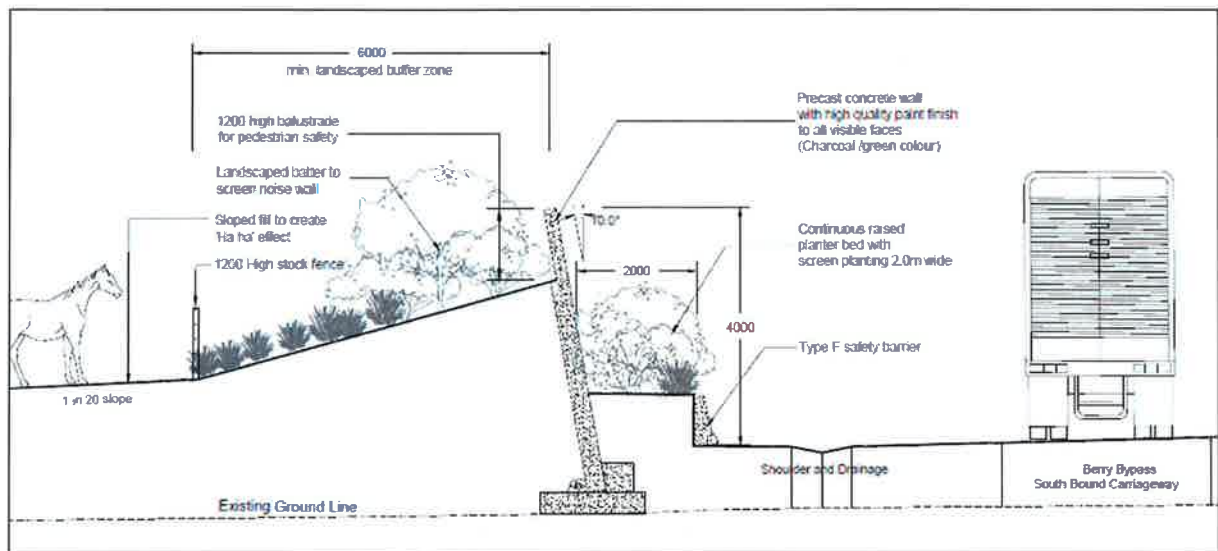


Figure 14 Indicative noise/visual treatment along the North Street corridor (Source: EA).

The Department notes that Mark Radium Park would be impacted by the proposal due to the proposed two-way road linking Victoria Street with Queen Street and the Kangaroo Valley Road Interchange. Discussion and consideration of these impacts is included in **Section 5.5** and **Section 5.6**.

While the Department is satisfied that the project has been designed to take into account environmental constraints, particularly visual impacts, it is recommended that a condition be imposed requiring the preparation of an Urban Design and Landscape Management Plan to be submitted to the Director General for approval. This will provide a greater level of detail with regards to a number of matters including noise wall heights and design, relocation of the Alexander Berry memorial, interchange treatments, landscape treatments to North Street public open Space and Town Park and the Town Creek diversion.

5.5. Socio-Economic and Property Impacts

Berry is unique in that the majority of visitors are not 'long haul' travellers, but people travelling to destinations in the region. As such, Berry could be considered a destination town. The majority of these visitors are from Wollongong and Sydney and usually on weekends where shopping, food and general browsing are the main attractions.

The Proponent has stated that the study area is dominated by agricultural and tourism industries as well as retail businesses within Berry. Approximately 24% of all businesses in the area are in the tourism sector, which is higher than the national average of 20.2%. Of the 105 businesses within Berry, 34 are likely to cater for locals and 71 would cater for locals, tourists and passing traffic.

In 2008, less than 15% of turnover resulted from through traffic for the majority of Berry retail businesses; however 70-75% of turnover for business such as petrol stations was experienced from through traffic. Accommodation and food and beverage businesses obtained 20-24% of turnover from through traffic.

In the year ending June 2011, domestic and international visitors to the area had increased by 11% and 13% respectively compared to the previous year. Agricultural land outside of Berry comprises predominantly dairy and beef production, however viticulture, goat rearing, livestock feed, turf farming and horse agistment also exist in the area.

The project would result in a number of changes in the vicinity of the existing and proposed highway and within the town of Berry. Potential impacts include amenity issues such as noise and vibration, air quality and public safety, and social and economic issues such as property connectivity and severance, and business viability, including highway dependent businesses.

During construction, the project could lead to positive economic benefits for local businesses as a result of approximately 500 workers who would utilise services and facilities in Berry (based on a 3 year construction period). This may provide localised economic stimulus and increase business turnover for this period. The Gerringong Upgrade and Berry to Bomaderry Upgrade (the Proponent is currently preparing the Review of Environmental Factors under Part 5 of the EP&A Act) would also contribute to increased business turnover during their respective construction periods, thus extending the duration of localised economic stimulus.

The most significant socio-economic impact of the project is likely to be at the operation stage with a reduction in business activities due to a reduction in the amount of stopping traffic following the opening of the project. This could result in impacts to highway-generated trade, and possibly the closure of highway-related businesses, which could lead to flow-on effects for other businesses and the community as a whole. Up to 71 businesses could be potentially affected, with motor vehicle services, food and beverage outlets and accommodation establishments most affected. Changes in traffic patterns are estimated to result in a reduction in motorists stopping by up to 78% percent, resulting in a gross annual turnover loss of approximately \$1.4 million to local businesses (turnover equivalent of approximately 2% of the total turnover in business in Berry), and loss of up to 17 full time equivalent jobs.

Additionally, the project would have a direct impact on 112 hectares of land outside of the existing highway corridor, which would be incorporated into the road reserve. The Proponent has indicated that long term impacts on property and land use would include the severance, fragmentation and reductions in the size of available agricultural and residential land. Of the 90 properties directly impacted by the project, the majority is rural land used for grazing purposes associated with dairying or beef production or horse agistment resulting in a potential annual loss of \$385,100. Land use sterilisation (when land has been fragmented to point where ongoing activities are unviable) would occur at properties around the Austral

Park Road interchange, around the western end of the Austral Park Road extension, Tindalls Lane interchange, the northern and southern interchanges for Berry and areas where the project closely follows the existing highway alignment.

Alternative access arrangements are proposed for properties that would have their access to the existing highway severed. Agricultural and rural residential properties located along the proposed highway's on-line upgrade sections would have direct access maintained but restricted to left-in left-out movements. Where road safety standards cannot be met at existing access points, the access would be relocated and driveway extended (where necessary).

The project would either sever or isolate some parcels of agricultural land, resulting in impacts to internal movements. Where an agricultural property would be severed into two or more parcels, internal access would be maintained by connecting the fragmented portions of land, if this is possible. The Proponent has stated that, as a result of consultation of with affected property owners, property underpasses near Toolijooa Ridge, extensions to an existing cattle underpass, and agricultural access under the Broughton Creek bridges would be required. The Proponent has committed to ongoing consultation with property owners during construction.

Department's Consideration

The Department acknowledges the potential for adverse impacts on the local economy of Berry at both the construction and operation stages of the project. The project would divert traffic away from town and therefore lead to a reduction in highway related business. This is considered to be an unavoidable impact associated with most road projects which include town bypasses, and would be partially offset by other benefits brought by the upgrade, such as improved safety and reduced traffic congestion and associated improvements in amenity.

The Proponent has committed to ongoing consultation with Council to assist in developing strategies to encourage the continued viability of Berry. These would include a Signage Strategy to encourage motorists to visit Berry and programs to enhance community areas and streetscapes.

With respect to the severance and acquisition of agricultural land, the Department considers that there would be impacts but also notes that the affected owners will be duly compensated for the loss of any land. While the project would require the acquisition of agricultural land, resulting in production and amenity losses for individuals, the Department notes that the total area of land directly and indirectly lost due to acquisition and severance is considered to be limited at a regional level and would not severely affect the profitability, productivity, viability or sustainability of the agricultural sector of Berry. Additionally, the Proponent proposes to offset impacts through the rehabilitation of surplus residual land, the amalgamation of severed parcels of land together, and by minimising the creation of lots without dwelling entitlements. The Department accepts that where residual parcels would no longer be viable as rural residential purposes, the Proponent would consider amalgamation of lots into adjoining land where possible or, depending on location, would be utilised for the Town Creek diversion or public open space.

A total of 1.3 hectares (32%) of the Berry Riding Club would be acquired for the project. The Proponent has committed to continue consultation with the club and Shoalhaven City Council during detailed design to identify an appropriate option for the relocation of the club. Indicative concept sketches have been provided by the Proponent as part of the RtS, demonstrating that the riding club could be accommodated in the vicinity of the existing facility in a reconfigured arrangement. Shoalhaven Council has also written separately to the Department indicating that discussions with RMS and the riding club have been ongoing and while a satisfactory outcome has not been reached to date, a resolution is expected in due course. The Department has recommended a condition of approval requiring ongoing

consultation with an aim to resolve prior to commencement of construction in the vicinity of the riding club.

The Department notes that Mark Radium Park would be impacted by the proposal due to the proposed two-way road linking Victoria Street with Queen Street and the Kangaroo Valley Road Interchange. This park is popular with travellers in peak periods due to the picnic facilities and duck pond. While the Department considers a loss of 3,609m² (29%) of public open space is undesirable, this impact is offset through the provision of new public open space along North Street, a new park known as Town Park located at the corner of George Street and Albert Street, the provision of a shared pedestrian/cycle pathway which is proposed to connect these areas with Mark Radium Park and a commitment to relocate the Alexander Berry Memorial.

A number of submissions were received relating to the access arrangements for The Arbour Village, the BUPA residential aged care facility and other private properties in the vicinity of Victoria Street and the existing highway. The Department notes the BUPA facility is currently accessed off Victoria Street via the internal road network of The Arbour, while other properties have access directly off the existing highway. As a result of the changes to Victoria Street and the Schofields Lane interchange, a new access is being constructed from the Schofields Lane interchange to the private residence adjacent to the BUPA facility. While a new access to the BUPA facility is not being constructed by the Proponent (the existing access is not being impacted), the provision for a new access from this location is not precluded by the project should the BUPA facility wish to develop this access in the future. The Department considers that this outcome is reasonable given the existing access arrangements to the BUPA facility will not be impacted by the project.

The Department is satisfied that through the implementation of the recommended conditions of approval (to minimise impacts to properties and to resolve access issues for residents impacted by the project) and mitigation measures proposed by the Proponent, the socio-economic and property impacts will be mitigated as far as practicable. While it is acknowledged that some economic and property impacts are likely as a result of this project, on balance, the benefits to the wider community are significant and therefore the Department considers that the socio-economic and property impacts of the project are acceptable.

5.6. Other Matters

Flora and fauna

The Proponent has undertaken a desktop study and field surveys of the project corridor and 50m buffer on either side of the corridor (known as the study area) which has revealed that a large amount of the study area (including a 5km radius of the study area) is either cleared or used for grazing purposes. Of the native vegetation that exists, a total of 25 plant communities have been mapped, 8 of which are mapped in the study area.

The study area is comprised of agricultural and rural properties as well as the existing Princes Highway road reserve. While most of the area outside the road reserve has been cleared for agricultural use, there are scattered patches of native vegetation and isolated remnant trees. There are a number of conservation reserves in the area including the Cambewarra Range Nature Reserve, the Seven Mile Beach National Park, the Barren Grounds Nature Reserve and the Saddleback Mountain Reserve. None of the reserves are directly impacted by the Project.

A total of 513 flora species were recorded in the study area, of which 78% were locally indigenous species. No threatened flora species were recorded in the study area during the survey, however a total of 17 vascular flora species listed under the *Environmental Protection Biodiversity Conservation Act 1999* (EPBC Act) and/or TSC Act have been previously recorded within a 10km radius of the study area. Potential habitat is considered

likely to exist within the study area for 5 endangered species under the EPBC Act. These include the White-flowered Wax Plant, Illawarra Socketwood, Delicate Cress, Hill Zieria and Illawarra Greenhood.

Additionally, the Riverbank forest community, while considered to be in poor condition by the Proponent, is likely to form part of an Endangered Ecological Community (EEC) as it is consistent with the *River-flat Eucalypt Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner Bioregions* listed under the *Threatened Species Conservation Act 1995* (TSC Act).

The vegetation communities recorded in the study area include the following:

- Illawarra gully wet forest;
- Currumbene-Batemans lowlands forest;
- Riverbank forest (EEC);
- Warm temperate layered forest;
- Constructed wetland;
- Closed grassland;
- Closed grassland/sedgeland; and
- Riparian open woodland.

The Proponent identified that an area of approximately 31 hectares of native vegetation would be cleared within the project footprint and an additional 27 hectares would be subject to indirect impacts such as edge effects. Direct and indirect impacts are shown in **Table 11** and include impacts as a result of the roadway, ancillary construction/operational facilities, temporary creek crossings during construction, the diversion of Town Creek and edge effects. The clearing of native vegetation, the proposed diversion of Town Creek (refer to **Section 5.3**) and indirect impacts would result in the permanent loss of foraging habitat, food and shelter resources, watery habitats and nesting habitat and roosting hollows. The loss of nesting and roosting habitats such as hollow-bearing trees, hollow logs and fallen timber could impact on fauna breeding behaviour. Further, there is an increased risk of fauna injury and mortality as a result of vehicle strikes along the highway. Habitat fragmentation would also restrict feeding resources for non-flying fauna.

Table 11- Native Vegetation Clearing

VEGETATION COMMUNITY	PREDICTED DIRECT IMPACT (ha)	PREDICTED INDIRECT IMPACT (ha)	PREDICTED TOTAL IMPACT (ha)
Closed grassland*	0.5	0.5	0.9
Closed grassland/sedgeland	2.2	0.3	2.5
Constructed wetland	0.4	0.3	0.7
Currumbene-Batemans lowlands forest	0.0002	2.4	2.4
Disturbed riparian open woodland	2.6	1.2	3.8
Illawarra gully wet forest	15.4	10.05	25.5
Riverbank forest**	2.9	7.1	10.0
Warm temperate layered forest	6.9	5.3	12.2
Total Native Vegetation Loss	31	27	58

* Not considered to be a native plant or derived native plant community

** Equivalent to the River-flat eucalypt forest EEC

The Proponent has identified that a total of 114 threatened, migratory and/or preliminary listed fauna species or their habitat have been previously recorded within a 10 kilometre radius of the study area. Of these, the Proponent assessed 73 fauna species listed as vulnerable or endangered under the TSC Act. A further 69 species, including both threatened species and migratory species, listed (or nominated for listing) under the EPBC Act were

assessed. A total of 9 threatened fauna species (EPBC Act / TSC Act) and 6 migratory species (EPBC Act) have been recorded in the study area during the field investigations:

Threatened Fauna Species

- Gang-gang Cockatoo;
- Powerful Owl;
- Yellow-bellied Sheath-tail bat;
- Eastern Freetail bat;
- Grey-headed Flying-fox;
- Eastern Bentwing-bat;
- Eastern False Pipistrelle;
- Southern Myotis; and
- Greater Broad-nosed bat.

Migratory Species

- White-bellied Sea-eagle;
- Fork-tailed Swift;
- Cattle Egret;
- Black-faced Monarch;
- Rufous Fantail; and
- Australian Reed-warbler.

A number of creeks are located within the study area, including Broughton Creek, Broughton Mill Creek, Bundewallah Creek and Town Creek. While much of the surrounding environments have been cleared for grazing, some riparian vegetation exists, particularly along Broughton Creek. A total of 36 fish species were identified as either potentially existing, or previously existing within the study area, however not all are likely to occur given that previous surveys were carried out in a wider area, including the Shoalhaven River system. Of these 36 species, 3 are exotic species. The Macquarie Perch is listed as an endangered species under the *Fisheries Management Act 1994* (FM Act) and EPBC Act. The Australian Grayling is listed as a protected species under the FM Act and vulnerable species under the EPBC Act. The Black Cod is listed as a vulnerable species under the FM Act.

In relation to creek crossings, both temporary (construction) and operational crossings would have the potential to affect riparian habitat and aquatic flora and fauna, particularly as a result of pollution and sediment runoff into waterways and loss and disturbance of riparian vegetation.

Department's Consideration

Impacts on Terrestrial Flora and Fauna

The Department notes that this project comprises one of three separate upgrade projects between Gerringong and Bomaderry. As such, cumulative impacts have been considered, resulting in a greater extent of clearing of native vegetation and habitats, including threatened ecological communities, as well as further fragmentation of habitats, including habitat for threatened flora and fauna. It is estimated that a total of approximately 72.08 hectares of native vegetation has been or would be impacted (both direct and indirect) for the 3 sections along the Princes Highway. The current project would contribute 81% of this impact. The total extent includes an estimated 12.249 hectares of endangered ecological community (equivalent), of which the Foxground and Berry bypass project contributes 10 hectares. In the context of other projects, and given the total distance of all 3 upgrades combined is 30.6km, the Department considers the impacts to be justified and notes the majority of mitigation and management measures proposed would apply to all three stages. It

is worth noting that the project would impact approximately 4% of EEC in the broader study area covering the 3 sections (65.7 hectares).

The Department accepts that the disturbance and removal of native vegetation for the proposal and the consequent impacts on native fauna, particularly threatened species is unavoidable given the nature of the landscape (in particular creek crossings). However, it is noted that the Proponent, through the route selection process, has identified a corridor which balances competing environmental, engineering, social and economic constraints. The Department acknowledges that this process may not result in an alignment with the least biodiversity impacts but would be a corridor where the biodiversity impacts are minimised as far as is feasible and reasonable.

The Proponent has selected the preferred route for the Foxground and Berry bypass project to minimise amenity impacts on residential areas, minimise detrimental impacts on active and passive recreational areas, as well as minimising the fragmentation of agricultural land and taking into account engineering design requirements to address flooding and hydrological constraints. The Department is therefore satisfied that the Proponent has adequately considered the likely impacts of the project on terrestrial flora and fauna, and measures to mitigate these impacts. Additionally, the Department has recommended conditions requiring further mitigation and monitoring during both construction and operational stages, such as construction environmental management plans and ecological monitoring plans.

Impacts on Habitat Corridors and Connectivity

The Department considers the main landscape in the study area is cleared grazing lands with some narrow strips of remnant riparian vegetation and relatively small pockets of native vegetation communities. However, the project crosses the Seven Mile Beach National Park – Barren Grounds Nature Reserve Wildlife Corridor, which is mapped under the deemed SEPP at Toolijooa ridge, with remnants at Broughton Creek, Tindalls Lane, Bundewallah Creek and Broughton Mill Creek (Refer **Figure 13**). Given the relatively small areas of native vegetation communities in the area, corridors such as these are important for maintaining movement of wildlife, in this case from Seven Mile Beach in the east to Barren Grounds in the west. While the Department notes the project will impact on this corridor through fragmentation, the vegetation in this area is relatively sparse. These impacts would be mitigated via the Proponent's commitment to include compensatory planting within this corridor, enhancing the density of vegetation cover in this section of the corridor.

While the proposed upgrade generally follows the existing Princes Highway, the bypasses of Foxground and Berry result in a new highway potentially exacerbating impacts on connectivity due to the additional barrier that is created.

The Department notes a number of fauna crossings are proposed, to mitigate these barrier effects and promote fauna movement, particularly within the identified wildlife corridor following construction of the upgrade. These include dedicated and dual use fauna underpasses, crossings under bridges, and rope bridges for arboreal species. Each underpass would be complimented by the installation of fauna furniture to attract and assist with successful crossings. Fauna fencing would also be installed in the vicinity of each crossing point to protect fauna from vehicle strikes. Additionally, replacement planting along Broughton Creek is proposed which includes enhanced connection to existing Toolijooa Ridge vegetation. This would also help mitigate adverse impacts of the project and improve connectivity along the Toolijooa Ridge Wildlife Corridor.

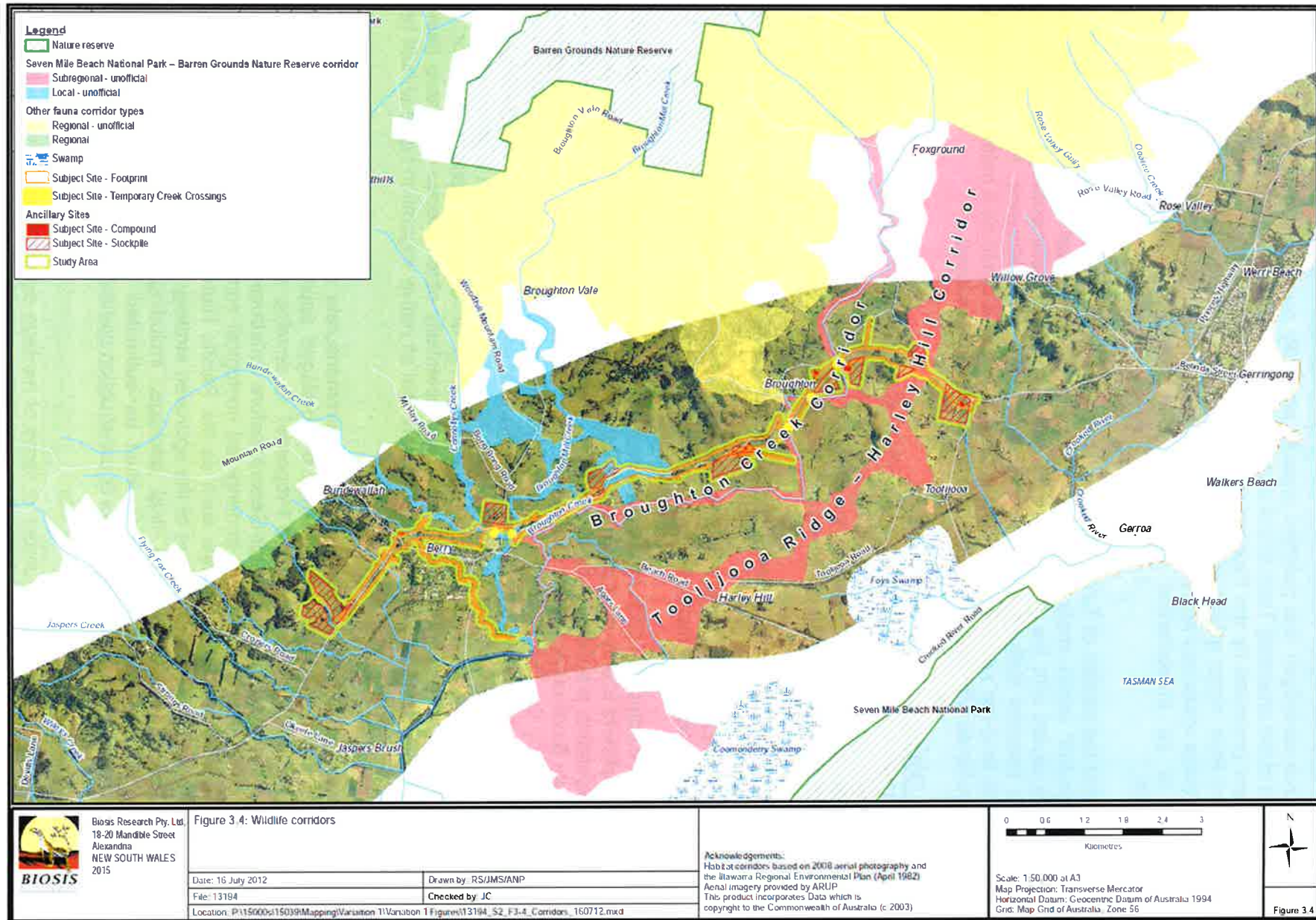


Figure 15 Wildlife corridors (Base Image Source: EA)

Impacts on Aquatic Flora and Fauna

The Department notes that the project involves a number of creek crossings, both during construction and operation. Additionally, the project involves the diversion of Town Creek. While it is acknowledged that potential impacts are likely on aquatic ecology, particularly downstream of the proposed Town Creek diversion, a number of mitigation and management measures are proposed by the Proponent (such as the preparation of a Flora and Fauna Management Plan, water quality monitoring, fish passage measures, and weed control). To strengthen these measures and further mitigate impacts, the Department has recommended conditions to be implemented as part of the project's construction environmental management.

It is noted that the section of Town Creek which passes through Berry is considered to be a 'highly degraded' urban channel comprising mainly exotic species. Notwithstanding, the impacts associated with the Town Creek diversion, including sedimentation accumulation due to less frequent flushing, may be considered detrimental. However, the Department considers the long-term benefits associated with this diversion would be a better outcome as impacts associated with flash flooding would be substantially reduced.

Biodiversity Offsets

The Department acknowledges the Proponent's draft Biodiversity Offset Strategy, which has been prepared to address the residual impacts of the proposal, both terrestrial and aquatic. The indicative offset requirements for the proposal are approximately 2.9 hectares of EEC (plus a further 7.1 hectares indirectly impacted by the proposal). The Biodiversity Offset Strategy also includes:

- Revegetation and rehabilitation of riparian vegetation in strategic locations (at a rate of 2:1); and
- Use of an appropriate legal instrument to acquire and/or secure native vegetation to ensure that the land is managed for conservation in perpetuity.

The Department notes that OEH raises concern in relation to the proposed offset, particularly given the Proponent is only proposing to offset the EEC vegetation type. OEH believes that all native vegetation proposed to be cleared (30.4 hectares) should be offset in accordance with RMS' own Biodiversity Offsets Guideline (November 2011). It is noted that this approach has been used by the Proponent on other highway upgrade projects across the state. The Proponent has not provided any clear justification for why only the EEC vegetation type would be offset, rather than all native vegetation proposed to be cleared. It is acknowledged that the native vegetation includes foraging, roosting or breeding opportunities for 9 threatened fauna species in the study area, and potentially other species that have been surveyed in the region. The Department considers that all native vegetation types should be offset.

In this regard, and to ensure that any offset is commensurate with the potential impacts of the proposal, the Department recommends a two-staged approach to finalising the offset package. The first stage requires the Proponent to develop a strategy framework to be finalised and approved by the Director-General before construction commences in areas that would affect threatened species or endangered ecological communities. This approach is consistent with other RMS approvals such as the Pacific Highway Upgrade projects. The second stage requires implementation of the approved strategy to determine the final offset package. The composition of the final package, including any monitoring or other ameliorative or management measures must be submitted to the Department for the Director-General's approval within 2 years of construction commencing.

Non-Aboriginal Heritage

The Proponent has identified a number of items of heritage significance in the study area, using heritage registers and schedules, literature reviews, field surveys and archaeological test excavation. The significance of these items was determined in accordance with the

Heritage Branch guidelines *Assessing Heritage Significance* (2001). Additionally, a Statement of Heritage Impact (SoHI) was prepared for each item in accordance with the Heritage Branch guidelines *Statement of Heritage Impact* (2002).

A total of 40 recordings were identified, including the Southern Illawarra Coastal Plain and Hinterland Cultural Landscape (SICPH CL). Of these, 34 recordings were deemed to have heritage significance following a significance assessment by the Proponent. Of these, 3 archaeological sites could not have the significance assessed as test excavations would be required to determine the nature of the deposits (and these items would not be impacted by the project). One site, the Graham Park former agricultural research institution is assessed as having state significance but is not impacted by the project.

A total of 8 are listed heritage items on the LEP. These are the Mananga Homestead and property, 20th century concrete bridge (Princes Highway, Broughton Creek), Glenvale Homestead and property (Broughton), St Patrick's Church, Convent and grounds (Berry), Dry stone wall (Toolijooa Ridge) Uniting Church Hall (Berry), an Avenue of 9 Poplar trees (on Woodhill Mountain Road, Berry), and Mark Radium Park (Berry).

The assessment of significance concludes that of the 34 items considered to have local heritage significance, 9 would be completely impacted by the project, 6 would be partially impacted 19 would be indirectly impacted. A number of items not directly impacted may experience indirect impacts associated with their visual and landscape contexts. The Proponent has concluded that the proposed impacts to these items would be acceptable subject to the implementation of a number of management recommendations.

The Department has summarised the proposed impacts to non-Aboriginal heritage items in **Table 1 of Appendix E**.

Aboriginal Heritage

The Proponent has also undertaken an assessment of impacts of the project on Aboriginal cultural heritage, including literature and database reviews, field surveys and test excavations. These assessments and excavations have been undertaken in consultation with the Aboriginal community, initially under the *Interim Guidelines for Aboriginal Community Consultation* (DEC, 2005) with the more recent works involving Aboriginal community consultation undertaken generally in accordance with the *Aboriginal cultural heritage consultation requirements for Proponents* (DECW 2010). The project has 108 Aboriginal stakeholders comprising a number of groups, including 3 local Aboriginal Land Councils, and individuals. Consultation has included a number of meetings, provision of reports, site inspections, and meetings.

A total of 42 Aboriginal heritage recordings have been identified within the study area, including places/areas of cultural significance to the Aboriginal community and Aboriginal archaeological sites comprising artefact scatters and isolated finds. These include:

- Places or landscapes of reported historical and cultural Aboriginal significance - Three ethno-historical recordings and one cultural landscape ('Brookside' Aboriginal encampment, Dicky Wood's Meadow battleground, the historical Aboriginal encampments at Berry and Toolijooa Ridge Aboriginal cultural landscape (TRACL); and 12 fig trees, considered to be a cultural landscape feature; and
- Archaeological sites - Surface artefacts, identified by previous investigations; an isolated surface scatter; and 23 sites containing surface artefacts based on the test excavation of Potential Archaeological Sensitive Areas (PASA).

The Brookside Aboriginal encampment is considered to have cultural significance due to the actions and destinies of Aboriginal people in the late 19th century, particularly relating to the interaction between Aboriginal and European people. The Dicky Wood's Meadow battleground is considered to have high significance due to an account by a local Aboriginal

person and the potential for burials. The historical Aboriginal encampments at Berry also have a high cultural significance for Aboriginal people as Aboriginal camping is either known, or likely to have occurred in the 19th century and as late as the 1960s where Aboriginal people would camp during seasonal employment as crop pickers. The Toolijooa Ridge is considered to have Aboriginal significance due to its role as a traditional access route between the escarpment and the coast. Large and old growth fig trees are considered to have significance for Aboriginal people as the buttresses were used as shelter, they were a source of food (figs, possums and fruit bats), are associated with the spirit of Yaroma and are also associated with birthing and women's lore.

Of the 23 archaeological sites, 11 are considered to have low archaeological significance, 9 are considered to have moderate archaeological significance, and 3 are considered to have moderate to high archaeological significance due to their association with the 'Brookside' encampment and Dicky Wood's Meadow battleground. The Aboriginal community has indicated that all archaeological sites have cultural value, but no specific significance grading has been provided.

The Department has summarised the proposed impacts to these Aboriginal recordings in **Table 2 of Appendix E**.

Department's Consideration

Impacts on Non Aboriginal Heritage

The Department has reviewed the Proponent's assessment and the proposed heritage impacts as a result of the proposal.

The SICPH CL is important for its predominately pastoral landscape of the coastal plains and adjacent escarpment. The Department notes the Proponent's statement that it "retains a fundamentally nineteenth century pastoral structure" and the importance of Berry and its relationship to this landscape. The Department considers the project has adequately responded to the natural landscape and while the project would be a visible piece of 21st century infrastructure, impacts on the cultural landscape will be minimised through detailed design. Further, the Department has recommended a condition of approval requiring the Proponent to prepare and submit an Urban Design and Landscape Management Plan (including consideration of heritage) prior to the commencement of construction.

The Department notes the Proponent's consideration of the possible relocation of *Glen Devan* which is a federation dwelling that would be fully impacted by the project. Submissions received during the exhibition period questioned the age of the dwelling, stating that this may be one of the oldest buildings in Berry. The Proponent has since provided a report on the probable age of the dwelling, concluding that it would most likely have been built prior to 1894 but not as early as 1870s as contested. While this confirms the Proponent's initial conclusions, the Proponent still proposes that the house be considered for relocation. The Department understands that this dwelling is not a local or state listed heritage item, however notes that the Heritage Council and the Royal Historical Society have raised significant concerns at the loss of this dwelling. The Department requires further consideration by the Proponent with regard to the management of impacts to this property, and has recommended a condition of approval requiring the Proponent to investigate the potential for relocation of the dwelling prior to the commencement of any construction works impacting the item or its setting.

It is noted that 2 statutory locally listed heritage items would be partially impacted by the project. These are the southern extent of the dry stone wall at Toolijooa Ridge, and the western boundary of Mark Radium Park in Berry.

The dry stone wall is a former boundary of highway easement approximately 100m in length. A further 150m of wall may exist to the north however is obscured by lantana. It is

acknowledged that the impacts to this wall are partial to the southern extent, and the recommended management measures include archival recording prior to the commencement of construction and retention of displaced rock material for re-use in any repairs required to the remainder of the wall. The Department considers the mitigation measures proposed would adequately minimise potential impacts to this item.

Mark Radium Park would be impacted as a result of the proposed two-way road linking Queen Street with Victoria Street. The Department acknowledges the Proponent's desire to minimise impacts on this park, which initially resulted in a loss of approximately 3,161m² (25%) as a result of the closure of Victoria Street and a narrower one-way road forming a southbound onramp to the upgraded highway. However, following public exhibition of the project and the level of community opposition to the closure of Victoria Street, the Proponent has revised the project to keep Victoria Street open and provide a two-way road connecting Queen Street and Victoria Street, resulting in an additional 448m² (4%) impact on Mark Radium Park. The Department considers that while Mark Radium Park would experience a greater impact, there are wider community benefits in keeping Victoria Street open with a two-way link road. Additionally, the duck pond within Mark Radium Park, which is a key feature of the park, would be retained.

A number of archaeological sites are also impacted by the proposal and not all sites have been investigated by the Proponent. The Department has recommended a condition of approval requiring further historic and physical investigations in relation to the archaeological sites including part of the Berry Estate tenant farm, town buildings and (former) old road alignments. The recommended condition requires the Proponent to undertake these investigations generally in accordance with the relevant heritage Council guidelines and in consultation with the Department and Heritage Council of NSW, to the satisfaction of the Director General.

Additionally a number of heritage items/properties will experience indirect visual impacts as result of the project. To ensure the current visual settings and landscape contexts are recorded prior to these indirect impacts the Department has recommended a condition of approval requiring archival recording and further historical research of these items prior to any pre-construction and construction activities taking place. The Department is satisfied, subject to these measures, that the indirect impacts resulting from the project will be minor in nature.

Overall, the Department considers that the Proponent's mitigation measures provide an appropriate framework to manage potential impacts during construction. Notwithstanding, the Department has recommended conditions of approval to further strengthen this framework, including the preparation of a Construction Heritage Management Plan, prepared in consultation with NSW Heritage Council. This Plan would include details of further archaeological investigations, details of management measures, procedures for dealing with previously unidentified heritage items, procedures for dealing with human remains, and heritage training and induction processes.

Impacts on Aboriginal Heritage

The Department understands that of the 42 recordings, 8 would be completely impacted by the project, 18 would be partially impacted and 16 would not be impacted by the project. Those completely impacted comprise archaeological sites with sub-surface deposits, and partially impacts a number of significant cultural sites including Toolijooa Ridge, Dicky Wood's Meadow battleground and Brookside encampment and one fig tree.

The Department understands that the Proponent has proposed an alignment that attempts to minimise impacts to these areas by following the existing alignment/disturbance corridor as closely as possible (with the exception of the bypasses of the bends at Foxground and Berry

township). Notwithstanding, potential impacts are likely to the highly significant cultural sites - Toolijooa Ridge, Dicky Wood's Meadow battleground and Brookside encampment. Toolijooa Ridge would be traversed by approximately 1.4km of new highway. The actual size and extent of Dicky Wood's Meadow remains unknown, however the Department understands that approximately 6.8% of the estimated area would be impacted. Similarly, with regard to the Brookside encampment, the actual area remains unknown, however it is anticipated that approximately 400m of new highway would pass through this area. Additional impacts are also proposed as a result of temporary ancillary facilities. Additionally, the Department notes that a resolution was made at an Aboriginal Focus Group meeting in November 2011 that the Toolijooa Ridge and Dicky Wood's Meadow battleground should be avoided at all costs.

While the Department accepts that impacts to these sites by the project are unavoidable, given the high level of significance attributed to these areas by the Aboriginal community, the Department has recommended a condition of approval requiring the Proponent to minimise impacts from the road corridor during the detailed design and construction of the project where possible.

In addition to the impacts as a result of the footprint of the new highway, further impacts may occur due to the establishment and operation of ancillary construction facilities. In most cases, these impacts are assumed based on known Aboriginal archaeological sites that may be located in the vicinity of these ancillary sites. However a number of sites are also located within the Toolijooa Ridge Cultural Landscape and Dicky Wood's Meadow battleground.

The Department has previously raised concerns regarding these potential impacts for temporary construction activities, particularly where the degree of impact is unknown (and yet to be assessed), particularly in relation to potential archaeological deposits. Impacts on cultural landscapes are more fully understood however these would tend to be short-term impacts related to the construction phase. It is noted however that Dicky Wood's Meadow battleground is particularly sensitive due to the potential for burials. Mitigation measures such as avoiding disturbance to natural ground levels are supported by the Department, however compaction would continue to be a threat to the intactness of any potential archaeological deposit(s).

As such the ancillary facilities proposed at these locations have not been approved at this point in time, and will require further assessment and evidence of how avoidance has been considered under the recommended ancillary facility condition (see Ancillary facility discussion below).

The Department considers that the Proponent has adequately taken into account Aboriginal heritage in its design footprint aspects of the project but notes a number of sites are located within the vicinity of the project and has therefore recommended the preparation of a Heritage Management Plan to manage heritage during both construction and operation of the project. This plan would include detailed methods to minimise and avoid impacts to heritage sites, archival recording, and is to be prepared in consultation with OEH and the Aboriginal stakeholders. Additionally, the Department notes that archaeological salvage excavation is recommended for some sites prior to the commencement of construction. The Department supports this recommendation.

The Department is generally satisfied that, taking into account the Proponents commitments and the recommended conditions, the project's direct and indirect impacts on Aboriginal and non-Aboriginal heritage items would not significantly affect the overall heritage values of the area and that any direct and potential indirect impacts can be appropriately managed.

Ancillary Facilities

The Department notes that the Proponents EA identified the location of 12 temporary ancillary construction facilities (such as compound sites, construction worker amenities, and

stockpile sites) and one permanent operational ancillary facility. Limited consideration of the environmental impacts of the temporary construction facilities was provided in the EA. In its assessment, the Department compared the facilities against the standard ancillary facility condition, which allows ancillary facilities that meet certain locational and environmental criteria (such as proximity to a residential receiver or watercourse, be located on relatively level land and in areas of low heritage or ecological value) and found that no sites met all the criteria.

The Department notes that the outstanding issues relating to the compounds include:

- unknown and unassessed biodiversity impacts;
- significant impacts to Aboriginal cultural sites, and no evidence of alternatives or avoidance has been provided;
- affects on adjacent land use;
- unknown information on flood levels; and
- proximity to waterways.

The Department has considered the proposed mitigation measures for the ancillary facilities and found that it remains unclear whether the impacts as a result of the construction and operation of the ancillary facilities can be appropriately managed.

As such the Department is not satisfied that the environmental and amenity impacts are either negligible or can be appropriately managed with the current level of information provided for these temporary construction sites and has not recommended approval of the 12 compounds as part of the project approval.

The Department has assessed the permanent operational facility and raises no objection to the facility and is recommended for approval as part of the project.

Notwithstanding, the Department has recommended the standard ancillary facility condition as part of the project approval and is of the view the recommended conditions will provide the Proponent with sufficient flexibility to deal with these sites depending on the level of assessed impact. The recommended condition also allows that sites that do not meet these criteria must be assessed in accordance with the assessment criteria outlined in the recommended conditions and submitted to the Director General for consideration.

Additionally, the recommended conditions would allow minor ancillary facilities (such as lunch sheds, portable toilet facilities) to be approved by the Environmental Representative (ER) provided they are located in an active construction zone within the project footprint and have minimal amenity and environmental impacts.

6. RECOMMENDATION

The Department is satisfied that the Foxground and Berry Bypass project is justified as part of the Princes Highway upgrade program, providing a continuous four lane divided highway between Waterfall and Jervis Bay Road, Falls Creek.

The Princes Highway is the major transport corridor on the NSW South Coast, and is identified in strategic planning as a critical component of improved road safety and freight efficiency initiatives along this important route. The proposal will provide an 11.6 km divided dual carriageway to motorway standard, reducing the frequency of conflicting turning movements, by limiting access to the highway by grade separate interchanges and left-in, left-out arrangements. The proposal will remove through-traffic from the Berry township, improving amenity and driver and pedestrian safety in the town centre and facilitating reduced travel times for inter-region traffic.

Following a detailed assessment of the EA, submissions from the general public and agencies, the Proponent's response to submissions, and the final Statement of Commitments, the Department is satisfied the potential impacts of the proposal have been addressed and are acceptable subject to the implementation of the recommended conditions of approval.

The Department considers there are a number of constraints to the project that will need to be carefully managed, include construction noise impacts, the development and implementation of mitigation measures for operational noise, property impacts and land acquisition, biodiversity impacts and offsets (particularly fauna movement and alternative habitat provision), non-Aboriginal and Aboriginal heritage, urban design, traffic and soil, water and hydrology. The Proponent has committed to a range of environmental safeguards and mitigation measures to avoid or minimise environmental impacts.


Based on its assessment, the Department considers that the proposal is justified and in the public interest. The implementation of the Proponent's commitments and the recommended conditions of approval would ensure that the proposal can be constructed and operated in a manner to minimise environmental and social impacts. Therefore, the Department recommends that the Foxground and Berry Bypass proposal is approved, subject to the recommended conditions of approval.



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9/7/2013

APPENDIX A ENVIRONMENTAL ASSESSMENT

See the Department's website at

http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=4453

APPENDIX B SUBMISSIONS

See the Department's website at

http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=4453

APPENDIX C SUBMISSIONS

See the Department's website at

http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=4453

APPENDIX D RECOMMENDED CONDITIONS OF APPROVAL
