

Bulahdelah

Upgrading the Pacific Highway

SUBMISSIONS REPORT

OCTOBER 2006





Submissions Report

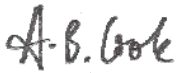
Bulahdelah Upgrade of the Pacific Highway

October 2006

RTA / Pub. 06.039

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Document Controls

Business Unit	Environmental Technology		
Project No	H/44507/A		
Document Description	Bulahdelah Upgrade of the Pacific Highway Submissions Report		
	Name	Signed	Date
Approving Manager	Andrew Cook		13 October 2006

Person(s) managing this document	Person(s) writing this document
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Location	File No.
G:\Ops\Environ\Assessments_Section\Projects\0405\Bulahdelah_Bypass\Report\Final\Oct 06\Bulah Subs Final Report_Public version_Oct 06.doc	4M4679

Document Status	Date
Final	13 October 2006

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Appendix G: Confidential Orchid Information – revised Appendix K from EIS

Note:

Appendices E, F and G have been withheld as they are confidential and not for public release.

Glossary of Terms and Abbreviations

ANPC	Australian Network for Plant Conservation
ANZECC	Australia and New Zealand Environment and Conservation Council
ASSMP	Acid Sulfate Soil Management Plan
CEMP	Construction Environmental Management Plan
CFG	Community Focus Group
DEC	Department of Environment and Conservation (includes the former Environment Protection Authority (EPA) and National Parks and Wildlife Service (NPWS))
DEH	Department of Environment and Heritage (Commonwealth)
DoP	Department of Planning (formerly DIPNR – Department of Infrastructure, Planning and Natural Resources)
DPI	Department of Primary Industries (includes Fisheries)
ECRTN	Environmental Criteria for Road Traffic Noise
EEC	Endangered Ecological Community
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
EMR	Environmental Management Representative
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
ICLR	Independent Community Liaison Representative
LALC	Local Aboriginal Land Council
LEP	Local Environment Plan
MCW	Mid Coast Water
NCC	Nature Conservation Council of NSW
NES	Matter of National Environmental Significance (defined under the EPBC Act)
NVM	Noise and Vibration Management
PAH	Polycyclic Aromatic Hydrocarbon
RNE	Register of National Estate
ROTAP	Rare or Threatened Australian Plants list
RTA	NSW Roads and Traffic Authority
SEDA	Sustainable Energy Development Authority
SIMC	Single Invitation Maintenance Contract
SIS	Species Impact Statement
TSC Act	<i>Threatened Species Conservation Act 1995</i>
VMW	Value Management Workshop

NB: *Corybas sp. aff. aciniflorus* has been reclassified as a new species, *Corybas dowlingii* during the preparation of the EIS.

I Introduction

I.1 Introduction

The RTA propose to construct approximately 8.5km of dual carriageway highway connecting the already upgraded Bulahdelah to Coolongolook section of the Pacific Highway, 4 kilometres north of Bulahdelah, to the approved Karuah to Bulahdelah Upgrade project, 4.5 kilometres south of the town (the Proposal). **Figure 1.1** provides an Overview of the Proposal as described in the EIS. The RTA is the proponent and nominated determining authority for the Bulahdelah upgrade. The approval of the NSW Minister for Planning is required before the Proposal can proceed.

The Proposal, shown in **Figure 1.1**, would depart from the alignment of the existing highway approximately 1.4 kilometres south of its intersection with Booral Road. The southern interchange would be located east of the alignment of the existing highway; it would provide access to Bulahdelah for northbound traffic exiting the new highway and for southbound traffic from Bulahdelah entering the new highway. A new bridge would be constructed over the Myall River, approximately 1 kilometre downstream of the existing bridge. **Figure 2.1** provides an artist's impression of the southern part of the Proposal.

The Upgrade would then pass beneath Bombah Point Road and through a major cutting (up to 24 metres deep) through the foothills of the Bulahdelah (Alum) Mountain. The Upgrade would be located at least 60 metres from the nearest residence on the eastern side of Bulahdelah and would pass through the abandoned Alunite mine site, a powerline easement and forested land owned by the NSW Department of Primary Industries.

The northern interchange would be located near the south-western corner of the Bulahdelah golf course. The interchange would consist of one large single-lane roundabout over the new highway, providing connections between the highway and local access roads. An artist's impression of the proposal highlighting the northern interchange in the foreground is shown in **Figure 2.2**. North of the northern interchange, the proposed Upgrade would generally follow the alignment of the existing highway and include an upgrade of the Frys Creek bridge and northbound carriageway for approximately 750 metres. The intersection of Wootton Road and the highway would be upgraded, including the removal of the existing northbound sliplane exit.

An Environmental Impact Statement (EIS) and a Species Impact Statement (SIS) for the Proposal (dated November 2004) were prepared on behalf of the RTA by Parsons Brinckerhoff in accordance with Part 5 of the *Environmental Planning and Assessment Act, 1979* (EP&A Act). Subsequent changes to the EP&A Act have resulted in the project requiring approval under the recently gazetted Part 3A of that Act.

In December 2005 the NSW and Federal Governments announced a jointly funded program of \$960 million for the three years to 2009. The Bulahdelah Upgrade project was nominated as a candidate project under this program. On 3 May 2006, the NSW and Federal Governments announced a joint funding package of \$37.6 million to progress this project.

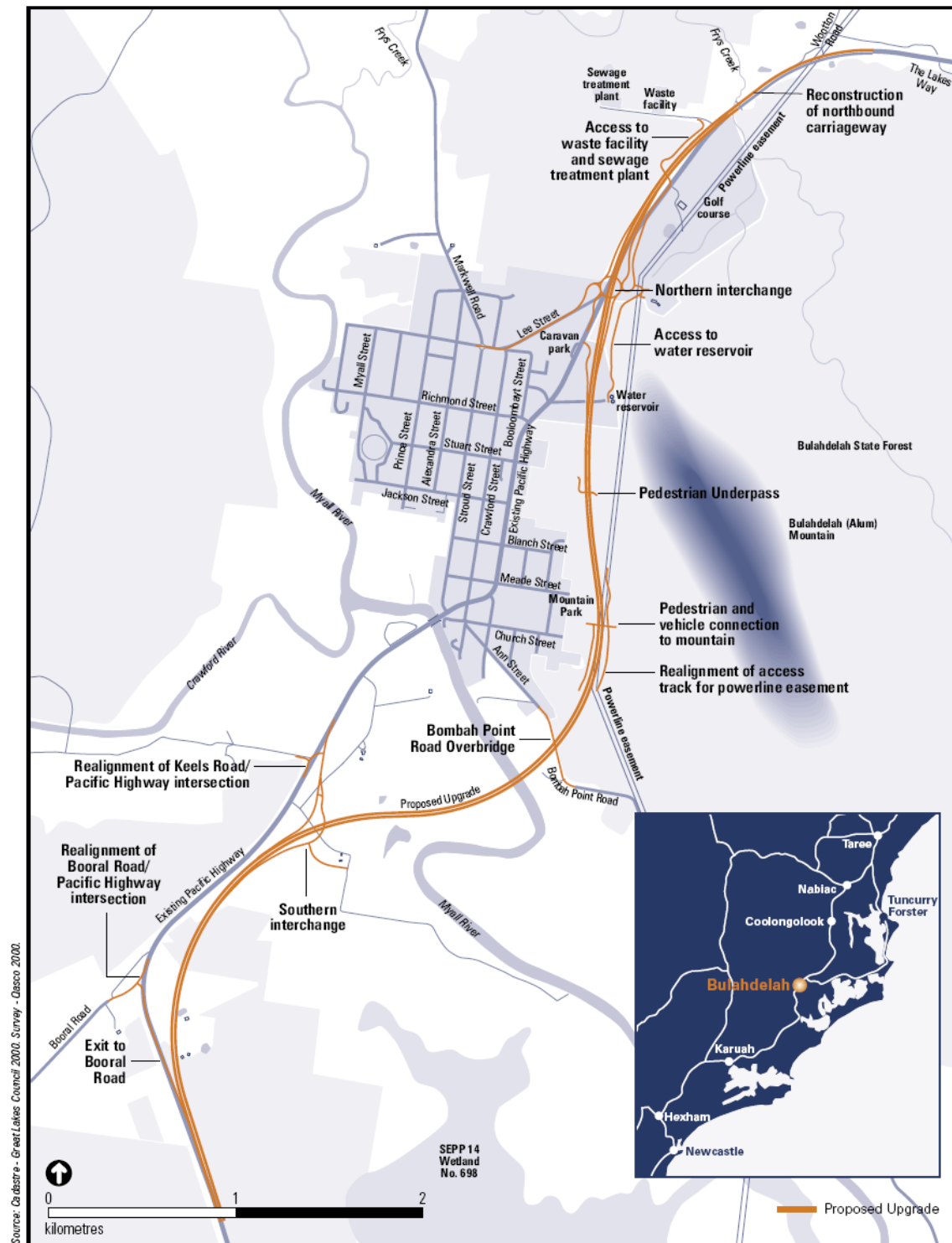


Figure I.I: The Proposal

1.2 Purpose of a Submissions Report

This Submissions Report has been prepared to satisfy the requirements of Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act), and demonstrates that the RTA has fully considered all submissions made during the exhibition period of the EIS and SIS. This Submissions Report will also assist the Director-General of the Department of Planning (DoP) in the further consideration of the Proposal.

This Submissions Report is structured as follows:

- **Chapter 1 – Introduction:** An introduction to the Proposal and environmental impact assessment process, as well as the consultation program undertaken to date.
- **Chapter 2 – Consideration of the EIS:** A consideration of the EIS and the Proposal as described in the EIS, including compliance with statutory requirements, the justification for the Proposal and the assessment of the environmental impacts of the Proposal.
- **Chapter 3 – Consideration of the SIS:** A consideration of the SIS and the Proposal as described in the SIS, including compliance with statutory requirements and a summary of the assessment of impacted species of flora and fauna as a result of the Proposal.
- **Chapter 4 – Consideration of Submissions:** A consideration of the submissions made in response to the exhibition of the EIS and SIS, and the RTA's response to issues raised in the submissions.
- **Chapter 5 – Correspondence:** A review of additional correspondence after the exhibition of the EIS and SIS.
- **Chapter 6 – Additional Investigations:** A summary of additional investigations or studies undertaken after the exhibition of the EIS and SIS.
- **Chapter 7 – Preferred Project and Statement of Commitments:** A description of the project proposed to be delivered. A Statement of Commitments is also included in the Preferred Project Report, to provide a comprehensive picture of the project to be delivered, inclusive of all environmental management and mitigation measures.
- **Chapter 8 – Conclusion.**
- **Chapter 9 – References.**

1.3 The Statutory Framework

1.3.1 NSW Environmental Planning and Assessment Act 1979

The environmental assessment and public exhibition processes were undertaken in accordance with Part 5 of the NSW EP&A Act. Under Part 5 the Proposal required the approval of the Minister for Planning and the concurrence of the Director-General of the Department of Environment and Conservation (DEC).

However, on 1 August 2005 Part 3A of the EP&A Act commenced. A Ministerial Order published in the NSW Government Gazette on 29 July 2005 declared that an activity for which the proponent is also the determining authority and which (in the opinion of the proponent) would require an EIS to be obtained under Part 5, to be a project to which Part 3A applies. In accordance with this Ministerial Order and transitional provisions introduced at that time, further consideration of the Proposal is continuing under Part 3A.

Approval for undertaking the Proposal within NSW was sought under Part 3A of the EP&A Act on 19 September 2005. At that time the RTA also requested that the Director-General of DoP adopt the environmental assessment requirements previously issued for the Proposal

and accept the EIS and public exhibition for the purposes of Part 3A in accordance with the EP&A (Infrastructure and Planning Reform) Regulation 2005. On 1 October 2005, the Deputy Director-General of the DoP agreed and asked the RTA to prepare a Submissions Report for the Proposal, including a Statement of Commitments and a Preferred Project Report as necessary.

Under Part 3A, the concurrence of the Director-General of the DEC is not required. Further, if the Proposal is approved certain other statutory approvals would not be required including section 87 permits and section 90 consents under the *National Parks and Wildlife Act 1974*.

1.3.2 Commonwealth Environment Protection and Biodiversity Conservation Act 1999

The EIS for the proposed upgrade of the Pacific Highway at Bulahdelah addressed Commonwealth requirements in accordance with the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Approval of the Commonwealth Environment Minister is required if the Proposal is determined to have a significant impact on any matter of National Environmental Significance (NES); or on Commonwealth land. Two plant species listed as threatened under the EPBC Act are present within and adjacent to the Proposed Upgrade on the footslopes of Bulahdelah (Alum) Mountain, and one further threatened species has been recorded in the area but not identified in recent surveys. Accordingly, the Proposal was referred to the Department of Environment and Heritage (DEH) in September 2003, to determine whether Commonwealth approval would be required in accordance with Section 4 of the EPBC Act.

After consideration of the Proposal, the DEH advised that the impact on those species would constitute a controlled action, and approval under Part 9 of the EPBC Act would be required. The DEH decided that under Section 87 of the EPBC Act, an accredited process must be used to assess the environmental impacts relevant to the Proposal. In March 2004, the 'Environmental Impact Statement' under Part 5 of the NSW EP&A Act, was declared to satisfy the requirements of an accredited process.

The NSW legislative changes brought about by the introduction of Part 3A of the EP&A Act, resulted in an amended environmental assessment regime for projects considered likely to have significant environmental impacts. The RTA notified the DEH of the changes to the assessment regime for the Proposal, and included correspondence from the NSW DoP, which, in accordance with relevant transitional provisions, indicated an acceptance of the Part 5 EIS published in respect of the Proposal, as satisfying the requirements of the amended EP&A Act and Regulation. Refer to **Appendix D** for a copy of the correspondence.

1.4 Preparation of the EIS

In accordance with the requirements of the various State and Commonwealth legislation as described above, an EIS and SIS were prepared for the Proposal by Parsons Brinckerhoff in conjunction with a number of specialist sub-consultants. Requirements and guidelines for the preparation of the EIS were provided by the then Director-General of DIPNR (in accordance with Clause 231 of the EP&A Regulation). These requirements were addressed in preparing the EIS. Compliance with these requirements is outlined in Appendix B of the EIS. The Director-General of DEC provided requirements concerning the form and content 70% of the SIS. The compliance with these requirements is outlined in Appendix A of the SIS. The Commonwealth Minister for Environment and Heritage in March 2004 accepted the

preparation of an EIS under the EP&A Act as an accredited process suitable for the assessment of the Proposal in accordance with Section 87 of the EPBC Act.

1.5 The Determination Process

The determination process for this Proposal is as follows. This process follows the earlier exhibition of the EIS and SIS under Part 5 of the EP&A Act and the subsequent request for approval in accordance with transitional provisions under Part 3A of the EP&A Act.

1. **Submissions Report is prepared:** This report is prepared in recognition of the EP&A Act and associated Regulation. The Submissions Report (including a Statement of Commitments and a Preferred Project report) sets out certain matters relevant to the decision in (2) below, including a consideration of the EIS and SIS, issues raised in submissions or correspondence received following the EIS and SIS exhibition, subsequent investigations, proposed modifications / preferred project and a Statement of Commitments for environmental management and mitigation measures.
2. **The RTA decides whether to progress request for approval:** The Chief Executive of the RTA considers the Submissions Report and decides whether to progress the request for approval of the Proposal under Part 3A of the EP&A Act.
3. **Submissions Report forwarded to NSW Minister for Planning:** A copy of the Submissions Report (including the Statement of Commitments and Preferred Project Report) is forwarded to the DoP. Copies of all submissions received during exhibition of the EIS and SIS were previously forwarded to the then DIPNR.
4. **DoP prepares report to NSW Minister for Planning:** The Director-General of the DoP considers the Submissions Report and all other relevant material, consults relevant agencies, assesses the Proposal and prepares an Assessment Report for the Minister for Planning to assist the decision as to whether to grant approval and, if so, on what terms and conditions.
5. **NSW Minister for Planning determines Proposal:** After considering the Assessment Report and any advice provided by the Minister for Roads, the Minister for Planning decides whether to grant approval and, if approval is granted, determines the conditions or modifications to impose on the carrying out of the Proposal.
6. **Approval of Commonwealth Minister for Environment and Heritage:** If approval from the NSW Minister for Planning is granted, approval from the Commonwealth Minister for Environment and Heritage is then formally sought. Copies of the Submissions Report and the approval from the Minister for Planning are forwarded to DEH.
7. **DEH prepares report to Commonwealth Minister for Environment and Heritage:** An Assessment Report is prepared by DEH after consideration of the Submissions Report and other relevant material. The Assessment Report prepared by DEH is provided to the Commonwealth Minister as one component of the package of matters to be considered in making an approval decision.
8. **Commonwealth Minister for Environment and Heritage determines Proposal:** After considering the Assessment Report and all other matters, and following consultation with other relevant Commonwealth Ministers, the Minister for Environment and Heritage decides whether to grant approval and, if approval is granted, determines the conditions to impose on the carrying out of the Proposal.
9. **Determination:** The Chief Executive of the RTA considers the terms of the approval of the NSW Minister for Planning and the Commonwealth Minister for Environment and Heritage and determines whether to proceed with the Proposal.

10. **Release of documents:** Both Ministers' approvals, the Assessment Reports prepared by DoP and DEH to their respective Ministers and the RTA's Submissions Report are all made public.

1.6 The Consultation Program

The consultation process for the proposed upgrade of the Pacific Highway at Bulahdelah commenced in March 2000. An outline of the community consultation involvement during the preparation of the EIS can be found in Chapter 2.5.2 (Volume 1) of the EIS and in further detail in Volume 2 (Technical Paper 1 – Community and Stakeholder Involvement). The various stages of consultation considered:

- The issues and constraints associated with upgrading the highway at Bulahdelah;
- A range of route options;
- A preferred option and refining that option; and
- The final proposal and documenting issues for the EIS studies.

A range of channels for disseminating and gathering information was provided. Techniques used to inform and consult with the community included a community focus group (CFG), newsletters, public meetings, household letters, advertisements, surveys, public displays, a toll-free 1800 telephone information line, website information, emails and postal correspondence. This range of communication tools ensured that groups and individuals had access to a medium of communication that suited them.

People and organisations involved included:

- Commonwealth, State and local government authorities;
- Commonwealth, State and local elected representatives;
- Local community groups such as the Bulahdelah Chamber of Commerce and the Bulahdelah and District Historical Society and representative groups such as the Karuah Local Aboriginal Land Council;
- Property owners along each of the route options, including the preferred route;
- Interested regional and local individuals; and
- The wider community.

1.6.1 Community Consultation prior to the EIS

An important component of the consultation program was the establishment of the Bulahdelah Upgrade CFG, formed locally from approximately 35 volunteers representing local residents and business operators. The CFG met 13 times identifying issues of concern and having input into design objectives, route options, planning, preferred route evaluation and the final impact assessment.

Newsletters were distributed at five stages of development of the preferred route to the residents and businesses in and around Bulahdelah. Newsletters were also sent to parties who had registered an interest in the project through the 1800 telephone line. The five newsletters covered the following issues:

- The need for the proposed Upgrade, and the study area under investigation;
- The five route options under consideration, with request for community and stakeholder comments;
- The announcement of the preferred route (Option E), with a request for comment from the community and other stakeholders;
- The refinement of the preferred route, and notice of the route that would be under consideration in the EIS; and

- The announcement of the exhibition of the EIS, with the request for comments.

In between release of the newsletters, letters were mailed out to every household in Bulahdelah, to keep residents in touch with specific items in the project, such as the current field work going on.

Display material was placed in public locations on three occasions during the development of the proposal. The first display illustrated the five route options, the second display showed the preferred route, and the third displayed a refinement of the preferred option. A fourth display was held in conjunction with the exhibition of the EIS documentation. Four locations were chosen in Bulahdelah, two locations in Forster and another display at the RTA Pacific Highway office in Grafton.

1.6.2 Consultation during development of the Proposal and EIS preparation

In addition to the display material outlined above, the consultation program during the preparation of the EIS included the following:

- Following the announcement of the preferred route in November 2001, the CFG re-opened its membership, with twelve new members – predominately landowners affected by the preferred route;
- A display of the preferred option, and subsequently a display of the refined Proposal, at key location within Bulahdelah and the greater region;
- A public meeting following the announcement of the preferred route, with all members of the public with an interest in the investigations invited to attend (approximately 90 did);
- A site inspection attended by approximately 60 people, touring the preferred alignment by bus, and discussing the Proposal with the study team;
- Advertisements were placed in local newspapers to announce the display of the preferred and then refined alignment, call for new members of the CFG, and to announce the community site inspection day;
- The ongoing maintenance and updating of the project website, providing access to meeting notes, key documents, and updates as key developments occurred during the proposal development;
- Formation of the Aboriginal Liaison Group (representing members of the Karuah Local Aboriginal Land Council, Department of Environment and Conservation, the Southern Woromi Traditional Elders and Owners Groups and Aboriginal members of the local community).

1.6.3 Exhibition of the EIS and SIS

The EIS, SIS were placed on exhibition at various locations in NSW between 24 November 2004 and 28 January 2005. Submissions in response to these documents were officially received up until 27 April 2005. Notification of the exhibition was advertised in local, State and National newspapers, and on the project and RTA website. Further details on the exhibition period are contained in Section 2.1 of this Submissions Report.

2 Consideration of the EIS

This Chapter presents the consideration of the EIS, both in terms of its compliance with statutory requirements and in terms of its environmental assessment and environmental safeguards. The RTA intends to proceed with the Proposal as presented in the EIS with modifications outlined in Chapter 7 of this Submissions Report. Legislation discussed in this Chapter is described as it was during the preparation of the EIS. Changes in the legislative framework relative to the Proposal are discussed in Chapter 1 of this Submissions Report.

2.1 Statutory Compliance

An EIS for the Proposal dated November 2004 was prepared on behalf of the RTA by Parsons Brinkerhoff (formerly PPK Environment and Infrastructure) and a number of sub-consultants. The statutory compliance of the EIS to both Commonwealth and NSW legislation is provided below.

2.1.1 Commonwealth Legislation

This Submissions Report has examined the Proposal in relation to the EPBC Act. Approval of the Commonwealth Environment Minister is required if the Proposal is determined to have a significant impact on any matter of National Environmental Significance (NES); or on Commonwealth land. Two plant species listed as threatened under the EPBC Act are present within and adjacent to the Proposed Upgrade on the footslopes of Bulahdelah (Alum) Mountain, and one further threatened species has been recorded in the area but not identified in recent surveys. Accordingly, the Proposal was referred to the DEH in September 2003, to determine whether its approval would be required in accordance with Section 4 of the EPBC Act.

After consideration of the Proposal, the DEH advised that the effect of the Proposal on the identified Commonwealth threatened species would constitute a controlled action, and approval under Part 9 of the EPBC Act would be required. The DEH decided that under Section 87 of the EPBC Act, an accredited process must be used to assess the environmental impacts relevant to the Proposal. In March 2004, the 'Environmental Impact Statement' under Part 5 of the NSW EP&A Act, was declared to satisfy the requirements of an accredited process.

2.1.2 NSW Legislation

The following is a summary of compliance with the relevant provisions of the EP&A Act applicable at the time the environmental assessment and public exhibition were undertaken.

The EIS addressed all relevant statutory requirements under the EP&A Act applicable at the time and took into account to the fullest extent possible, all matters affecting or likely to affect the environment by reason of the activity as per Section 111 of the EP&A Act. The EIS was prepared in accordance with the prescribed form and manner set out in Section 112(1)(a) of the EP&A Act. The EIS also complied with Clause 228 of the EP&A Regulation. Table 2.1 sets out the NSW statutory requirements relevant at the time the EIS was prepared and exhibited.

Table 2.1: NSW Statutory Requirement Checklist

Reference	Requirement
Section 111 of the EP&A Act, 1979	Requires the RTA to examine and take into account to the fullest extent possible, all matters affecting or likely to affect the environment by reason of the Activity.
Section 112(1)(a) of the EP&A Act, 1979	Relates to the preparation and consideration of an EIS in accordance with the prescribed form and manner.
Clause 228 of the EP&A Regulation 2000	Compliance with Section 111 and 112 of the EP&A Act 1979.
Clause 230 of the EP&A Regulation 2000	Content of the EIS.
Clause 231 of the EP&A Regulation 2000	Content of the EIS – Requirements of the Director-General of the Department of Infrastructure, Planning and Natural Resources.
Section 111 of the TSC Act, 1995	Content of the SIS – Requirements of the Director-General of the National Parks and Wildlife Service.
Clause 234 of the EP&A Regulation 2000; Section 113 of the EP&A Act 1979.	The notification and exhibition of the EIS.
Section 113(3), 112(1)(c) of the EP&A Act, 1979	Providing the Secretary of the Department of Planning with all representations made during the EIS exhibition.
Section 113(2), 112(1)(b) of the EP&A Act, 1979.	Receipt and consideration of representations made to the RTA or any other determining authority during the statutory exhibition period.

These requirements are covered in the EIS and summarised in this Section, and Section 3 of the Submissions Report.

Clause 230 of the EP&A Regulation

The EIS was prepared to comply with Clause 230 of the EP&A Regulation. This clause requires that (where no other guidelines are in force) an EIS comply with Schedule 2 of the Regulation. Sections 1.1.4 and 2.1.1 of the EIS and Appendices B and C of the EIS describe the compliance with Schedule 2 of the EP&A Regulation.

Clause 231 of the EP&A Regulation

The EIS was prepared to comply with Clause 231 of the EP&A Regulation. This clause requires that the Director-General of DIPNR must be consulted concerning the form and content of any EIS. The Director-General was consulted before the commencement of the EIS and provided a number of requirements (May 2004). The correspondence from the Director-General can be found in Appendix B of the EIS.

Appendix C of the EIS sets out a checklist of matters to be addressed in the EIS as developed in part from the Director-General's requirements. Each requirement was addressed in the EIS.

Clause 234, EP&A Regulation – Statutory Exhibition of the EIS

The EIS was exhibited from 24 November 2004 to 28 January 2005, which satisfies the statutory 30 day period of exhibition from either the date on which the notice was first published in the daily newspaper circulating generally throughout the State, or the date on which the notice was first published in the local newspaper, whichever is the later.

First and second round statutory advertisements (in accordance with Clause 234) were published as follows:

Newspaper(s):	Great Lakes Advocate	Wednesday 24 November
		Wednesday 1 December
	Manning River Times	Wednesday 24 November
		Friday 26 November
	Myall Coast NOTA	Thursday 25 November
		Thursday 2 December
	Port Stephens Examiner	Thursday 25 November
		Thursday 2 December
	Newcastle Herald	Wednesday 24 November
		Thursday 25 November
	Sydney Morning Herald	Wednesday 24 November
		Thursday 25 November
	The Australian	Wednesday 24 November
		Thursday 25 November

The EIS and SIS were exhibited at the following locations:

- The Roads and Traffic Authority (Sydney)*
- The Roads and Traffic Authority Pacific Highway Office*
- The Roads and Traffic Authority Forster Motor Registry*
- NSW Government Information Centre
- Nature Conservation Council (NSW Environment Centre)(Sydney)
- (The then) Department of Infrastructure Planning and Natural Resources Planning Centre (Sydney)
- Great Lakes Council
- Bulahdelah Information Centre
- (The then) Department of Infrastructure Planning and Natural Resources (Grafton)
- Bulahdelah Rural Transaction Centre*

At locations marked with asterisk (*), copies of the EIS and SIS were available for purchase in either hard copy or CD.

Provision of Representations

Forty seven (47) representations were received in response to the exhibition of the EIS. In accordance with the requirements of Section 113(3) and 112(c) of the EP&A Act, these representations were provided to the then Department of Infrastructure Planning and Natural Resources and the Department of Environment and Conservation between 9 February and 23 December 2005.

2.2 Development of the Proposal in the EIS

The EIS established the need for the Proposal, considered options for satisfying that need, and outlined the concept design development process and design principles. A summary of these aspects is presented below.

2.2.1 Need for the Proposal

The Pacific Highway is the major transport link between Sydney and Brisbane, as well as servicing a growing population along the North Coast of NSW. Travellers on the Pacific Highway at Bulahdelah experience major delays in peak times, particularly during summer holidays. With projected future increases in traffic volumes, traffic delays at Bulahdelah will increase and driver safety will further diminish unless improvements are made to the highway. It is predicted that traffic volumes on the highway at Bulahdelah will grow from 11,900 vehicles per day in 2002 to about 24,100 in 2028. The operation of the existing Pacific Highway also divides the town and reduces safety and amenity for local residents. Currently there are approximately 112 properties, including two schools and a church experiencing traffic noise levels exceeding accepted criteria.

In terms of the overall progress of the Pacific Highway upgrading program, the sections of Pacific Highway around Karuah and from Karuah to the southern edge of Bulahdelah are planned to be completed in stages over the next five years. The Upgrade at Bulahdelah is a critical link in 190km of dual carriageway between Hexham and Taree. The completion of the proposed Upgrade would eliminate the major constriction to traffic movement at Bulahdelah.

2.2.2 Options Considered

Using an iterative process, route alternatives for the proposed Upgrade were considered, reviewed and eliminated or adopted. Alternatives were developed and considered over a two year period, and evolved from extensive engineering, traffic, environmental and economic investigations and in consideration of the results of the various consultation programs with members of the local community, State Government Departments, Local Government and others. In considering the route alternatives for the Upgrade, two distinct phases were employed. The first stage assessed numerous alternatives to develop a short list of route options. The second stage of investigations focussed on this short list of options, and selected a preferred route.

In the initial stage of assessment, four broad corridors were considered:

- West of Bulahdelah;
- Through the town of Bulahdelah;
- To the east of Bulahdelah, but close to town; and
- East of Bulahdelah (Alum) Mountain.

This broad consideration of alternatives yielded 14 potential route options. Following assessment and consultation with the Community Focus Group, five alternatives were selected for further development and refinement. Two through-town options were selected (Options C and D), indicating the strong community preference for a route that would support the town economy by providing access to the passing traffic on the Pacific Highway. Two options were developed to the west of Bulahdelah (Options A and B), and one option was chosen to the east of Bulahdelah (Option E), but on the Western side of Bulahdelah (Alum) Mountain.

Evaluation criteria were developed in consultation with the Community Focus Group, and in consideration of the objectives of the Pacific Highway Upgrading Project to assist in the

selection of a preferred route. A summary of the results of the route assessment is provided in Table 2.2.

Table 2.2: Summary of Comparative Assessment of Shortlisted Options

Shortlisted Options					
Key Objectives	Options				
	A	B	C	D	E
Improves the efficiency of travel, safety and accessibility	High	Medium	Low	Medium	High
Improves environmental quality outcomes	High	High	Low	Low	Medium
Achieves environmental sustainability outcomes	Medium	Low	High	High	Medium
Achieves acceptable socioeconomic and financial outcomes	Medium	Medium	Low	Medium	High
Achieves acceptable design and engineering and constructability outcomes	High	Medium	Low	Medium	High

Source: *Technical Paper 3 — Need and Route Evaluation*.

Qualitative Indicators

High Medium Low Poor

Option E (immediately to the east of Bulahdelah) ranked highest, when compared with the other four options. Option E was announced as the preferred option by the Minister for Roads in November 2001. Following some opposition to the preferred option, as announced by the Minister for Roads, an independent review of the merits of the through town Option C was commissioned, and undertaken between early to mid 2002. The conclusions of the review were that the adverse impacts on Bulahdelah, posed by a through town option could not be effectively managed, and as a result Option E was re-affirmed as the preferred route for the proposed Upgrade.

2.2.3 Development of the Preferred Option

The concept design was developed in response to a range of constraints that affect the preferred route. A range of design alternatives was considered that addressed community issues relating to the connections between the selected route of the proposed Upgrade, the town of Bulahdelah and surrounding district. The goal was also to reduce the environmental impacts of the alignment. The key design alternatives considered were:

- The links with the existing road network;
- Interchange form; and
- Refinement of the alignment between Mountain Park and Lee Street.

Throughout the development of the preferred route and the refinement of the design, the community was consulted so that concerns and ideas were appropriately incorporated in the design and the assessment studies. The community contributed directly to developing the proposed Upgrade, in terms of:

- The selection of the preferred option, which takes into account the community's desire to minimise the economic impacts on the town wherever possible;
- Minimising the impacts on heritage items such as the alunite mine;

- Minimising impacts on the Bulahdelah (Alum) Mountain Aboriginal Place;
- Articulating the need for two separate interchanges rather than the originally proposed single, central interchange to help reduce economic impacts;
- The design of the northern interchange to reduce property impacts and allow a northbound exit ramp that feeds directly to the town's main arterial road; and
- The location and design of the southern interchange, considering driver views, free-flowing access to the town and property impacts.

2.3 General Description of the Proposal in the EIS

The Upgrade would involve the construction of approximately 8.5 kilometres of dual carriageway highway connecting the already upgraded Bulahdelah to Coolongolook section of the Pacific Highway, 4 kilometres north of Bulahdelah, to the approved Karuah to Bulahdelah Upgrade project, 4.5 kilometres south of the town. The road corridor for the Upgrade would be between approximately 60 metres wide and 200 metres wide. The maximum width would be at the interchanges.

The proposed Upgrade, shown in Figure 1.1, would depart from the alignment of the existing highway approximately 1.4 kilometres south of the intersection of the existing highway and Booral Road. The southern interchange would be located east of the alignment of the existing highway; it would provide access to Bulahdelah for northbound traffic exiting the new highway and for southbound traffic from Bulahdelah entering the new highway. A new bridge would be constructed over the Myall River, approximately 1 kilometre downstream of the existing bridge. Figure 2.1 provides an artist's impression of the southern part of the proposal.

The Upgrade would then pass beneath Bombah Point Road and through a major cutting (up to 24 metres deep) through the foothills of the Bulahdelah (Alum) Mountain. The Upgrade would be located at least 60 metres from the nearest residence on the eastern side of Bulahdelah and would pass through the abandoned Alunite mine site, a powerline easement and forested land owned by the Department of Primary Industries.

The northern interchange would be located near the south-western corner of the golf course. The interchange would consist of one large single-lane roundabout over the new highway, providing connections between the highway and local access roads. An artist's impression of the Proposal highlighting the northern interchange in the foreground is shown in Figure 2.2.

North of the northern interchange, the proposed Upgrade would generally follow the alignment of the existing highway and include an upgrade of the Frys Creek bridge and northbound carriageway for approximately 750 metres. The intersection of Wootton Road and the highway would be upgraded, including the removal of the existing northbound sliplane exit.

2.4 Environmental Impacts of the Proposal

As described above in Section 2.2 and shown in Table 2.2, Option E was selected as the preferred route because of its good relative performance against selected criteria. However, the development of the concept design responded to a range of socio-economic and biophysical constraints (described in Chapter 3 of the EIS) that affect the preferred route. This resulted in a number of concept design alternatives being developed for each of the major components of the Proposal's concept design which were then assessed using the following criteria:

- Accessibility
- Environmental effects
- Socio-economic and financial effects; and
- Engineering feasibility and ease of construction

The selection for the preferred alternative for the alignment and the connections to the existing road network has resulted in the avoidance and/or minimisation of a number of environmental impacts.

In accordance with the statutory requirements, the EIS addressed the environmental impacts of the Proposal and outlined mitigation measures to reduce the impacts. A summary of each of these aspects is presented below. This summary does not include additional studies undertaken since the exhibition of the EIS. These additional studies are described in Chapter 6 of this report.

2.4.1 Flooding and Local Drainage

Bulahdelah and its surroundings are subject to the impacts of flooding from the Myall and Crawford Rivers, as well as local flooding due to inadequate drainage systems within the town. The proposed bridge over the Myall River and the construction of the embankment of the Proposal across the floodplain would result in increased water level upstream (afflux) during flood events. The afflux resulting from the Proposal would affect two residences located between the existing bridge over the Myall River, and the new (proposed) bridge. Mitigation options for the houses and access arrangements would be further assessed and negotiated with the property owners prior to construction of the Proposal.

Existing inadequacies of local stormwater infrastructure in Bulahdelah contribute to a number of flooding issues, particularly during large storm events. The central section of the proposed Upgrade, between Bombah Point Road and the northern interchange, presents an opportunity to reduce existing local flooding issues within the town. This would be achieved by using the embankment of the Upgrade to divert and detain a proportion of stormwater flows. A proportion of the peak flows which flow from the mountain would be detained on the eastern side of the proposed Upgrade and a proportion would also be diverted south to the Myall River. Flows resulting from the smaller, more frequent rainfall events would not be changed from the existing situation. The construction of the Proposal would result in reductions in peak flows of up to 30 percent for some of the drainage catchments flowing through Bulahdelah. Further consideration of flooding and drainage issues is provided in Technical Paper 8 of the EIS.

2.4.2 Water Quality

Monitoring of water quality within the Myall River, Crawford River and Frys Creek recorded results that were found to generally exceed relevant guideline values. Potential impacts on water quality within the Myall River and Frys Creek during construction are:

- Increased sedimentation and turbidity due to site disturbance;
- Building wastes, litter, paint and associated paint wastes;
- Toxicant and hydrocarbon contamination from spills;
- Nutrients from fertilisers, herbicides and pesticides used in landscaping;
- Acids from washing; and
- Disturbance of acid sulfate soils or contaminated soils.

Potential impacts on water quality during operation of the Proposal are the discharge of contaminants from road runoff and accidental spills into watercourses.

Measures proposed to protect water quality are of two kinds, namely:

- The inclusion of physical measures in the design aimed at settling out sediment and other materials from runoff during construction and operation; and
- The appropriate management of activities during construction aimed at minimising the levels of suspended solids and pollutants in site runoff.

Sediment basins are included in the proposal to intercept stormwater runoff from the construction site and to allow sediment to settle before discharge to natural watercourses or drainage structures crossing the alignment. During operation of the proposed Upgrade, some sediment basins would be retained as water quality basins to capture road runoff and contain accidental spills as required. Further consideration of water quality issues is provided in Technical Paper 8 of the EIS.

2.4.3 Flora and Fauna

Following initial investigations for the EIS, it was determined that an SIS would be required to assess the impacts of the Proposal on certain threatened species, and endangered ecological communities. In an attempt to minimise duplication of information, the SIS was combined with the ecological assessment. Therefore, information relating to the impacts of the Proposal on Flora and Fauna has been consolidated in Chapter 3 of this Submissions Report and Technical Paper 7 of the EIS.

2.4.4 Geotechnical Risks

The Proposal would require construction of a cutting through an area of soil on the footslopes of Bulahdelah (Alum) Mountain containing rock fragments and boulders which have been transported from the higher reaches of the mountain. This aspect of the design and the features of the surrounding footslopes and mountain create potential hazards, associated rock falls and potential slope failure. The following measures would be undertaken during construction to ensure that the identified potential hazards would be within the limit of 'acceptability' and therefore not considered a credible risk:

- Trimming of the cut batters to remove all loose gravels, cobbles and boulders exposed on the face;
- Regular inspections of the cut face to assess the extent of weathering and erosion and the need for additional removal of loose material; and
- Monitoring of groundwater conditions after construction.

Further consideration of geotechnical risks is provided in Technical Paper 9 of the EIS.

2.4.5 Aboriginal Heritage

Nine Aboriginal sites have been identified within or immediately adjacent to areas where construction of the proposed Upgrade would occur. These include five scatters of stone artefacts, two scarred trees and two isolated finds. Eight areas were also identified which may potentially contain archaeological deposits. At the time of writing the EIS, two additional locations were reported as being of potential Aboriginal significance. Aboriginal cultural heritage significance can only be determined by the Aboriginal communities and is dependant on written submissions by the Karuah Local Aboriginal Land Council (Karuah LALC). Where possible, the proposed Upgrade has been designed to avoid impacts, however in some cases it is not possible to avoid impacts, and salvage operations would be undertaken in consultation with the Karuah LALC, in order to preserve items of heritage significance. Further consideration of Aboriginal heritage issues is presented in Technical Paper 16 of the EIS.

2.4.6 Non-Aboriginal Heritage

Fifteen sites of heritage significance have been identified within or immediately adjacent to the Proposal. Two of these sites are of particular heritage significance. They are associated with the former alunite mine and the site of the former home of Rachel Henning, an Australia literary figure of the nineteenth century. Despite the route alignment and concept design having been developed to avoid, where possible, impacts on the alunite mine site, the proposed alignment bisects the precinct. The Mountain Access Overbridge has been designed to complement the heritage values of the area and link the disconnected portions of the site. The site of the former home of Rachel Henning would be outside the area of construction; however the site's context would be altered by the presence of the Upgrade nearby. The historical value of the site would be enhanced with interpretive signage and incorporation into the project of a pedestrian walkway on the Bombah Point Road overbridge. Further consideration of non-Aboriginal heritage is provided in Technical Paper 16 of the EIS.

2.4.7 Air Quality

Alunite is a naturally occurring non toxic mineral that was mined and processed at Bulahdelah (Alum) Mountain between 1878 and 1927, and again between 1934 and 1950. Chemical processes were used to alter the structure of and properties of alunite to manufacture the chemical alum. When alum is mixed with water it forms the hazardous sulphuric acid. Any residual alum from the mining and processing operations would have reacted with rainwater and any resulting acids dissipated in the environment. It is highly unlikely that there would be any remaining alum that could pose a risk to the community during construction of the Proposal.

Dust would likely be generated during the construction of the Proposal however the magnitude of this dust generation would be dependent on the silt and moisture content in the soil and types of works being carried out. Dust suppression measures would be employed during the construction period, and monitoring would be undertaken to ensure that dust levels would not exceed criteria set by the Department of Environment and Conservation. Further consideration of air quality issues is provided in Technical Paper 15 of the EIS.

2.4.8 Construction Noise and Vibration

Twenty-two noise sensitive receivers are located within 200 metres of the Proposal. It is estimated that 20 would experience construction noise levels that exceed the Department of Environment and Conservation criteria for construction noise. Both St Josephs Primary School and Bulahdelah Primary School are more than 200 metres from the proposed new works. However, they may experience short-term exceedances of construction noise criteria from time to time. Options to reduce construction noise levels at these locations would be investigated. Blasting would be used to remove material in the large cutting and as part of the construction of the northern interchange. The vibration levels produced would largely depend on the charge used and details such as stemming, depth and type of detonating cord. Pre-testing and using smaller charges would ensure that construction activity achieves Department of Environment and Conservation criteria. Further consideration of construction noise and vibration is provided in Technical Paper 14 of the EIS.

2.4.9 Operational Noise

The impacts of the operational noise generated by the proposed Upgrade have been assessed using criteria developed by the Department of Environment and Conservation. Mitigation measures including the use of low noise road surface, noise barriers, and further investigation of architectural treatments would be required to generally achieve the

criterion. Notwithstanding the implementation of these mitigation measures, some noise sensitive receivers would still experience small exceedances of the noise criteria. Also, some residences would be subject to increased noise levels compared to the noise levels they presently experience, while still being within noise criteria. Measures to mitigate noise impacts are subject to finalisation following further evaluation during detailed design development. Further consideration of operational noise issues is provided in Technical Paper 14 of the EIS.

2.4.10 Visual Amenity

Visually, construction activity would be obtrusive. Vegetation would be cleared, topsoil removed, embankments and cuttings formed, and bridges and other structures constructed. Construction activities on the Myall River floodplain would be visible from the existing Pacific Highway, a number of private properties located on the floodplain and from more elevated locations such as lookouts on Bulahdelah (Alum) Mountain. Construction near and over the Myall River would be more obscured. Construction activity within the western footslopes of Bulahdelah (Alum) Mountain would be largely obscured by existing vegetation. Further north, construction activity, especially the construction of the northern interchange would become more visible from both the existing Pacific Highway and some residences within the town. This construction activity would be a dominating feature of the landscape for approximately 36 months.

Permanent changes to the local visual character would occur following the opening of the proposed Upgrade. The Bulahdelah State Forest and the western footslopes of Bulahdelah (Alum) Mountain are covered in dense forest and include several exposed rock outcrops. Views of the proposed Upgrade from the town would largely be shielded by existing vegetation. The northern interchange would result in a more substantial visual change to the surrounding landscape. This would include a major cut into the existing ridge line and the construction of two major bridge structures and on and off ramps. Views of the northern interchange would be possible from the northern parts of town. There would be some loss in scenic quality and general amenity for users of the golf course. Planned new landscape works would partly alleviate these impacts. Further consideration of visual amenity issues is provided in Technical Paper 12.

2.4.11 Socio-economic including Landuse

Bulahdelah has a high level of business and employment dependence on highway traffic stopping for goods and services. On average approximately 1200 vehicles stop in Bulahdelah each day. The route development and concept design processes have responded to the desire of the local community and the economic needs of the town to continue Bulahdelah's role as a highway service town. The proposed upgrade is located in close proximity to the town, and interchanges have been strategically located north and south of the town to allow relatively convenient access to the town. In addition, the design of the interchanges has recognised the need to provide visual cues for drivers of the exits to Bulahdelah. Other measures to encourage this would include the provision of advance signing of Bulahdelah. Notwithstanding the above, the operation of the Proposal is expected to adversely affect the revenue generated by some local businesses and, as a result impact local employment.

The area of the road corridor would be approximately 132 hectares. The majority of the corridor, 81 hectares, is held in public ownership (RTA, Crown land, Mid Coast Water and Department of Primary Industries). The remaining 51 hectares of the road corridor is held in private ownership. No residences are located within the proposed road corridor. About 16 hectares of the Bulahdelah State Forest would be occupied by the road corridor. The road corridor would also sever approximately 8 hectares of the forest. Access across the proposed Upgrade for forestry vehicles would be provided adjacent to Mountain Park. The

Department of Primary Industries, which manages State Forests, also manages Mountain Park which would be partly impacted by the proposed Upgrade. A concept plan for the reinstatement of Mountain Park has been prepared and would be further discussed with the Department. The road corridor crosses approximately 29 hectares of land currently used for agricultural purposes.

The most significant impact on a single agricultural enterprise is the acquisition requirements for a property on the Myall River floodplain, where the road corridor would occupy an area of over 23 hectares. Within this property, underpasses for cattle and farm machinery would be available through waterway and drainage structures. The road corridor would occupy a large portion of a property which is owned by Mid Coast Water on the northern bank of the Myall River. The site was formerly occupied by the sewage treatment plant and is currently disused.

There would be a range of impacts on nine privately owned properties north of Mountain Park. In some cases the road corridor would occupy a significant proportion of the properties and full acquisition may be required. Less than 1 hectare of the Bulahdelah Golf Course would be required for the proposed Upgrade. The access road to the golf course, waste facility and sewage treatment plant would be close to the golf course and provide safe access from the northern interchange. Users of the golf course would experience some noise and visual impacts during construction. A number of private properties could be temporarily used for construction sites. If the Proposal is approved, the RTA or its contractor(s) would seek to reach formal agreement with these property owners regarding the temporary use of their properties. Further consideration of socio-economic and Landuse issues is provided in Technical Paper 13.

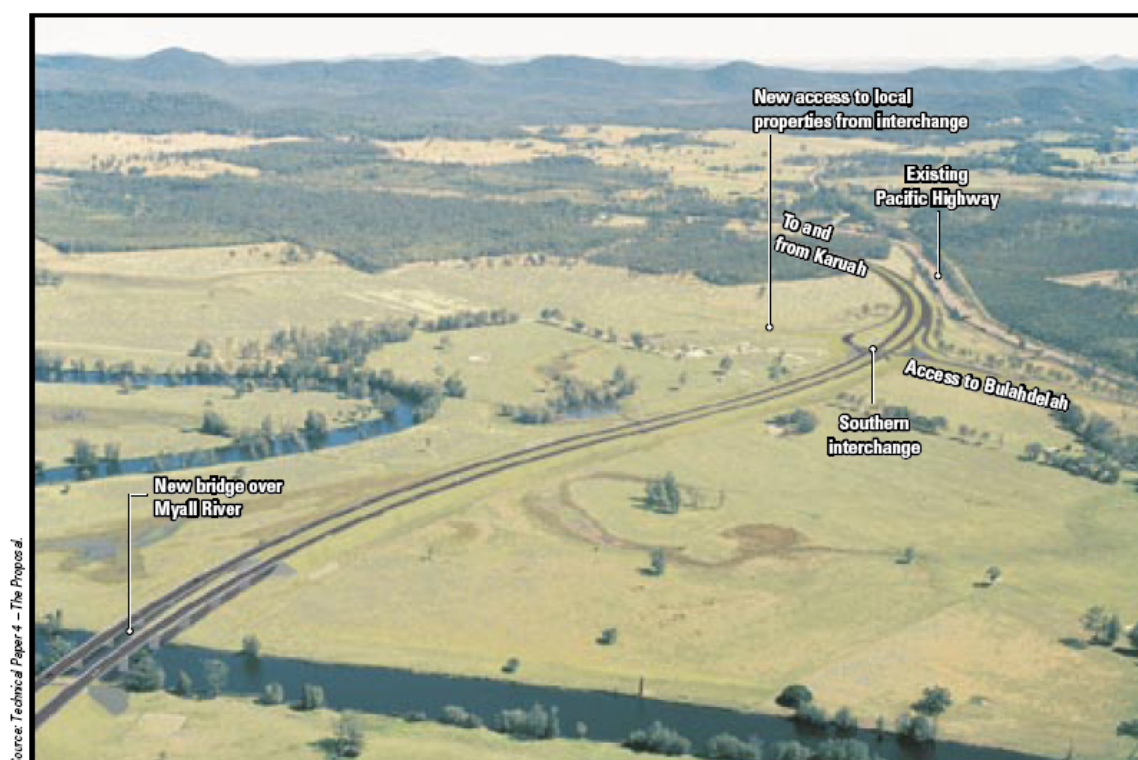


Figure 2.1: Photomontage of Southern Section (Looking South)



Figure 2.2: Photomontage of the Central and Northern Sections (Looking South)

2.5 Conclusion of the EIS

The proposed Upgrade of the Pacific Highway at Bulahdelah would meet the adopted proposal objectives for the Pacific Highway Upgrade Program. It would improve the efficiency and safety of travel on the Pacific Highway, in one of the last links of highway yet to be upgraded in the southern section. This would have benefits to both the state and national economies. The quality of the local environment would be generally improved in Bulahdelah, with the removal of traffic from the existing highway, and with future traffic predictions taken into account, these improvements in the local environment are likely to be marked. There have been considerable resources and measures employed into the concept design of the Proposal to reduce adverse environmental impacts, however there would be a number of residual impacts resulting from the proposed Upgrade, including:

- Individuals of five flora species of National and State significance would be removed during the construction of the Proposal. For one of these species, the Eastern Underground Orchid (*Rhizanthella slateri*), this would be a significant impact at a State level, and for two other species, significant at a Regional and possibly State level. The impact on the remaining two species would be significant at a Local level;
- The Proposal would cut through the historic Alunite Mine Precinct. The integrity of this site would be altered. A plan of management to protect and enhance the site would be developed and implemented in consultation with the Department of Primary Industries and Department of Environment and Conservation;
- Two residences and their access roads would have increased frequency of flooding as a result of afflux from the proposed Upgrade;
- Some residences would experience increased traffic noise levels. Public spaces such as Mountain Park and the golf course would also experience increased noise

conditions. There would be short term noise impacts on residences and schools as a result of construction;

- There would be loss in visual amenity from some residences with direct views of the Proposal in some areas. Visual amenity during construction would also be diminished. Visual amenity is expected to improve as landscaping matures; and
- There would be a decrease in the amount of revenue local businesses derived from highway traffic.

3 Consideration of the SIS

3.1 Introduction

The ecological assessment and Species Impact Statement (SIS) was prepared by Parsons Brinckerhoff Australia Pty Ltd on behalf of the RTA. In order to minimise duplication of information, the ecological assessment and SIS prepared for the Proposal were combined into one volume. The study area was determined as being 1 kilometre either side of the Proposal; that is 2 kilometres wide and approximately 9 kilometres long, covering an area of 1987 hectares.

A total of 105 fauna and 22 flora species were assessed as part of the study. These species were derived from the Commonwealth DEH Protected Matters Search Tool Database, and the list of threatened and regionally significant species identified as “subject species” by the Director General of the DEC (formerly the National Parks and Wildlife Service). A number of additional species were added to the list for investigation based on sightings recorded within or adjacent to the study area.

Further assessment of many of these species was not required due to a lack of suitable habitat or their respective occurrence being outside the area of impact. A total of 21 species were considered to be affected by the Proposal, and detailed species profiles were prepared and presented in Technical Paper 7. The SIS sought to further assess the impacts of the Proposal on threatened flora and fauna species identified within the study area. The following section provides a summary of these findings, with further detail provided in the SIS, Technical Paper 7.

3.2 Statutory Compliance

3.2.1 NSW Legislation

Assessment under Section 5A of the EP&A Act, determines whether there is likely to be a significant effect on threatened species, populations or ecological communities or their habitat. As it was determined that the Proposal would potentially have a significant impact on a number of threatened species and communities, an SIS was prepared to accompany the EIS for the Proposal. Table 3.1 sets out the NSW Statutory requirements relevant at the time the SIS was prepared and exhibited.

Table 3.1: NSW SIS Statutory Requirement Checklist

Requirement	Relates to what...
Section 112 of the EP&A Act 1979	Relates to the preparation and consideration of an SIS and accordance with the prescribed form and manner.
Section 110 and 111 of the <i>Threatened Species Conservation Act 1995</i>	Content of the SIS – Requirements of the Director-General of the NSW National Parks and Wildlife Service.

3.2.2 Commonwealth Legislation

The Proposal is deemed a controlled action under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) due to the likely significant impacts on nationally threatened species and ecological communities. On 2 March 2004, it was

determined under Section 87 of the EPBC Act to accredit the environmental impact assessment process under the NSW EP&A Act 1979 for the assessment of the Proposal. Once the State process is complete, a copy of the EIS, assessment report and all other relevant EIA documentation would be provided to the Commonwealth Minister for the Environment and Heritage who will then determine if approval should be granted under the EPBC Act 1999.

3.3 Summary of the Ecological Assessment and SIS

3.3.1 Existing Vegetation

Twenty-two vegetation communities were identified within the study area. Three of these communities were preliminarily listed as endangered ecological communities (EEC) pursuant to the TSC Act at the time of writing the SIS. In addition to these listed communities, 14 communities recorded are considered to be regionally significant.

3.3.2 Flora Species

The study area supports the largest known populations of the nationally significant Leafless Tongue Orchid (*Cryptostylis hunteriana*) and the largest known population of the rarely observed and little known Eastern Underground Orchid (*Rhizanthella slateri*). Bulahdelah is also the type location of the Eastern Underground Orchid¹.

The study area is also known habitat for an additional two plant species of National significance (Black Apple (*Angophora inopina*) and *Macrozamia flexuosa*) and one additional plant species of State significance (Red Helmet Orchid (*Corybas downlingii*, formerly *Corybas* sp. aff. *aconitiflorus*)). Previous studies have found another three species of State significance in the study area (Black-eyed Susan (*Tetratheca juncea*), Magenta Lilly Pilly (*Syzygium paniculatum*) and Native Woodruff (*Asperula asthenes*)).

Ferguson's Ironbark (*Eucalyptus fergusonii* subsp. *fergusonii*), a plant listed as rare on the Rare or Threatened Australian Plants list (ROTAP) is also present in the study area as are another 16 species of regional significance.

3.3.3 Existing Fauna Species

The study area provides potential habitat for three terrestrial fauna species of national conservation significance (Spotted-tailed Quoll (*Dasyurus maculatus*), Grey-headed Flying Fox (*Pteropus poliocephalus*) and Stuttering Frog (*Mixophyes balbus*)). In addition, 18 migratory bird species were recorded in the study area with the potential for the study area to provide habitat for another 12 migratory species.

The study area provides known habitat for at least 12 terrestrial fauna species of State significance and potential habitat for another eight threatened species.

3.3.4 Fauna Habitat

The study area contains a number of important habitat features including:

- Sections of three regionally significant wildlife corridors;
- Habitat for five fauna species of Regional significance;
- One fauna habitat (rocky outcrops) of Regional significance and at least one habitat of high Local significance (swamp mahogany);

¹ At the time of writing the SIS, information on the Eastern Underground Orchid, Leafless Tongue Orchid and the Red Helmet Orchid was contained within a confidential Appendix of the SIS, due to the sensitive nature of the orchids and their habitat.

- Locally important foraging and nesting habitat for a resident population of Black-necked Storks (*Ephippiorhynchus asiaticus*);
- Regionally significant roost and maternity sites for Little Bent-winged Bats (*Miniopterus australis*) and Common Bent-winged Bats (*Miniopterus schreibersii*);
- Nesting habitat of high local significance for the Peregrine Falcon (*Falco peregrinus*);
- Greater than 125 tree hollows providing roosting and nesting resources of high local significance for at least six threatened species; and
- Habitat for a locally significant population of Squirrel Gliders (*Petaurus norfolcensis*).

3.3.5 Aquatic Ecology

There are two important watercourses in the study area – Myall River is a Class 1 watercourse providing major fish habitat and Frys Creek is a Class 2 stream providing moderate fish habitat. A further two Class 3 waterways provide habitat for resident Black-necked Storks (*Ephippiorhynchus asiaticus*).

These waterways provide important refuge and foraging resources for migratory bird species along the Myall and Crawford River floodplain, habitat for at least 21 fish species in the Myall-Crawford River catchment and habitat for at least 42 families of macroinvertebrates.

3.4 Impacts of the Proposal

In accordance with the statutory requirements, the SIS addressed the environmental impacts of the Proposal on threatened species, populations and communities and their habitats, and outlined mitigation measures to reduce these impacts. A summary of these impacts is presented below and further detail is provided in Technical Paper 7 of the EIS. This summary does not include information from additional studies undertaken since the exhibition of the EIS and SIS. Results of the additional studies are described in Chapter 6 of this Submissions Report.

From the ecological assessment and consideration of the factors outlined in Section 5A of the EP&A Act, it was determined that the Proposal would likely have a significant impact on 5 threatened flora and 1 threatened fauna species, as described in Table 3.3. The Proposal would result in the loss of rare and threatened species including individuals of the nationally significant Leafless Tongue Orchid and Black Apple and the State significant Eastern Underground Orchid, Red Helmet Orchid and Ferguson's Ironbark. Table 3.2 outlines the reduced impact on the orchid species after further refinement of the alignment.

Table 3.2: Reduced impacts on Orchid populations following refinement of the alignment

Species	% of Population impacted prior to refinement	% of Population impacted after refinement
Eastern Underground Orchid	25% direct impact	4% direct impact (21% indirect impact)
Leafless Tongue Orchid	38% direct impact (19% indirect impacts)	27% direct impact (25.5% indirect impact)
Red Helmet Orchid	25% direct impact	10% direct impact (15% indirect impact)

In total, the Proposal would remove 35.3 ha of vegetation and habitat. This removal would occur from 12 native vegetation communities, eight of which are regionally significant and one which is listed as an EEC on the TSC Act (preliminarily listed at the time of writing the SIS).

Sixty-three hollow bearing trees would be removed resulting in a local impact for the threatened Squirrel Glider, and other species utilising similar habitat including microbats, owls and possums. Foraging habitat would be lost for both the threatened Glossy Black Cockatoo and Black-necked Stork and foraging resources would be fragmented with likely disruption of seasonal movement patterns for the Squirrel Glider, although these impacts are considered to be locally significant. Other fauna species whose habitat would be fragmented would be Black-chinned Honeyeater and Grey-headed Flying Fox with the potential to also impact Masked Owl, Stephens Banded Snake, Pale-headed Snake, Green-thighed Frog, Bush Stone-curlew, Spotted-tailed Quoll and Koala.

The Proposal has the potential to change the hydrology of the study area. If soil moisture conditions cannot be maintained downhill of the alignment in the area where orchids occur, additional individuals of Eastern Underground and Leafless Tongue Orchids may be subject to additional adverse impacts.

Table 3.3: Impacts from the Proposal on species of conservation significance

Species	Impacts from the Proposal
Ferguson's Ironbark	Removal of some individuals and habitat for the species, in addition to some fragmentation of the known population. Mitigation includes revegetation of the species. The impacts are significant at a local level.
Squirrel Glider	Removal and fragmentation of some winter foraging and nesting habitat for this species, isolating a small habitat remnant to the west. Potential to create a significant barrier to movement for the local population. Limited opportunities to mitigate barrier impacts. The impacts are significant at a local level.
Black Apple	Removal of a small number of individuals and habitat for the species, and its hybrid. Mitigation includes revegetation of the species. The impacts are significant at a local level.
Red Helmet Orchid	Removal of some individuals and habitat for the species. No fragmentation of the known population or barrier impacts for pollinators or seed dispersers. The Proposal would significantly impact on the species at a regional and possible state level
Eastern Underground Orchid	Removal of some individuals and habitat for the species. The Proposal would fragment the known population, although mitigation measures may enable movement between individual plants for the seed disperser. Limited opportunities to mitigate habitat loss and the maintenance of soil microclimatic impacts. The impact of the Proposal would likely be significant at a state level given the size of the population, and the fact the site is the type location for the species.
Leafless Tongue Orchid	Removal of a large number of individuals and habitat for the species. Secondary impacts may increase the number of affected individuals. The Proposal would fragment the known population, and possibly create a barrier to pollinators. Limited opportunities to mitigate

Species	Impacts from the Proposal
	habitat loss, barrier impacts and the maintenance of soil microclimatic environment. Translocation (although not considered a mitigation) would also be undertaken, although is experimental with success being uncertain. The Proposal would significantly impact on the species at a regional and possibly State level.

3.5 Environmental Management Measures

During the development of the Proposal, the alignment was substantially refined, and further engineered to ensure that impacts were avoided where possible, minimised where avoidance was not feasible, resulting in some residual impacts for which further environmental management measures were designed and proposed to be implemented. The following section outlines the major mitigation measures proposed to minimise the impacts of the Proposal on threatened flora and fauna.

Flora

Seeds of the threatened orchids would be placed in cryostorage to ensure long term maintenance of genetic material. Propagation trials for the threatened orchids would also be undertaken in conjunction with the DEC.

Translocation of species is considered by DEC to be an emergency procedure undertaken only where habitat destruction is imminent. Any translocation would be undertaken in accordance with the DEC translocation policy and would incorporate the Australian Network for Plant Conservation Translocation Guidelines (2004).

Underground Orchid and Leafless Tongue Orchid have not been successfully translocated to date. Experts consulted in regard to the relocation of these species have expressed doubts that these species could be successfully translocated. Translocation of the orchid species is considered to be experimental however if road construction is imminent it would be attempted. A translocation plan would be written for the orchids and translocating trials established as a separate contract by the RTA immediately following approval.

Fauna and Habitat

Fifty eight hectares of compensatory habitat would be provided as part of the Proposal. The RTA has implemented a compensatory habitat package for the southern section of the Pacific Highway from Hexham to Port Macquarie in agreement with DEC. This agreed package compensates for the loss of key habitat during construction of the Proposal.

Portions of trees containing hollows would be removed and reinstated in adjacent forest areas. If hollows are damaged or destroyed during clearing or are very large (posing a safety risk) then nest boxes would be affixed to standing trees as replacements. Post placement monitoring would ensure these nest boxes do not become utilised by identified pest species.

Seed would be gathered from the existing *Allocasuarina* before clearing to use for rehabilitation of the construction sites. At least 4 ha would be revegetated to compensate for the 2 ha to be removed, reinstating valuable habitat for the threatened Glossy Black Cockatoo.

Fauna Underpasses, culverts and fauna exclusion fencing

Three bridges would be built along the proposed upgrade. While these bridges are not designed specifically to act as fauna underpasses they would fulfil this function. An overpass for the Mountain Access Track designed primarily for pedestrian and vehicular access may

also assist some fauna species to safely move over the road. In addition, 22 culverts would be installed for drainage purposes and may potentially be used by terrestrial fauna.

A number of box culverts constructed for the two identified wetlands would be stepped higher than the surrounding culverts to enable terrestrial fauna to safely move under the Proposal during dry periods. During flooding the culverts may be used by frogs, eels and fish.

Fauna exclusion fencing would be constructed along both sides of the proposed upgrade north of Bombah Point Road to Station 97750 and then on the eastern side of the road to the golf course and then on the western side of the road to just beyond Frys Creek.

Glider crossings

Mitigation measures for gliders may comprise gliding poles, rope/wire bridges or a combination of both. The proposed measures are dependant on the results of monitoring along the Karuah Bypass and would be designed in consultation with DEC.

3.6 Conclusion of the SIS

The SIS was prepared in accordance with relevant Commonwealth and NSW statutory requirements applicable at the time. As set out in Section 1.3.1 of this Submissions Report, the DoP has accepted the SIS (as part of the EIS) for the purposes of Part 3A of the EP&A Act.

The Proposal would traverse an area having natural values consistent with a site of regional significance. However the presence of the largest known populations of two threatened orchid species elevates the conservation significance of the study area to a national level. Despite the stated environmental management measures and steps to avoid impacts during route selection and refinement, residual impacts including the loss of 35 hectares of native vegetation, loss of individuals of species of conservation significance, fragmentation and barrier impacts remain.

The compensatory habitat package agreed to by the RTA and the DEC includes land that has been transferred to DEC and also the provision of funding for the preparation of Recovery Plans for the Eastern Underground and Leafless Tongue Orchid. The SIS also detailed monitoring guidelines for threatened orchid populations, hollow-nesting mammals and Squirrel Gliders.

Longer term impacts of the Proposal may include alterations to hydrological regimes, potentially leading to habitat changes, or the contamination from spills or existing sources. Many of these potential impacts have been addressed by the inclusion of management measures and procedures that would serve to avoid or minimise the impacts. However, even with these measures in place, a risk of reducing local biodiversity remains.

The inclusion of fauna exclusion fencing, culverts/bridges, reinstatement of hollows/nest boxes, erection of gliding poles/bridges, seed collection, vegetation rehabilitation and the installation of water quality structures would serve to reduce the risk of loss of significant flora and fauna species. Although it is not recognised as a mitigation measure, translocation trials for threatened orchid species are also proposed.

4 Consideration of Submissions

Submissions received during public display of the EIS and SIS were logged and subsequently considered. An overview of this process follows:

- The details of each respondent were entered into a database and allocated a unique submission number.
- Each issue raised within a submission was identified as a Broad Issue (for example: Biodiversity, Air Quality, Heritage, etc...) then broken down into a more detailed Specific Issue (for example: Fauna, Flora, Indigenous Heritage, Non-Indigenous Heritage, etc...).
- Consideration of each Specific Issue was undertaken by the proponent in consultation with their specialist consultants, including those commissioned to prepare the EIS and SIS. Written responses to each Specific Issue have been included in this Report. Appendix A provides a detailed description of the individual issues raised in each respondent's submission.

Table 4.1: List of Respondents

Surname	Given Name	Organisation	Rep #	Section Where Issues are addressed in this Report
Colquhoun	Lachlan		1	4.1.1, 4.5.4, 4.8.4
Bowtell	Kevin & Alacoque		2	4.1.3, 4.3.1, 4.7.1
Colquhoun	Lachlan		3	Refer Rep # 1
Stanfield	John		4	4.1.3, 4.3.1, 4.4.1, 4.4.2
Stephenson	Alan	Australian Orchid Council	5	4.1.1, 4.1.2, 4.1.3, 4.4.1, 4.5.4, 4.6.1, 4.8.3, 4.8.4
Graham	Jeff	Bulahdelah Golf Club Limited	6	4.5.2
Wade	Adele		7	4.1.1, 4.1.3, 4.1.4, 4.2.2, 4.5.3, 4.5.4, 4.9.3, 4.10.1, 4.14.1
Ailison	Denis		8	4.1.3, 4.3.1
Laughton	Freda		9	4.1.1, 4.1.4, 4.5.3, 4.5.4, 4.6.1, 4.8.3, 4.8.4, 4.10.1, 4.11.2
Wade	Adele		10	4.1.1, 4.1.3, 4.5.2, 4.5.3, 4.5.4, 4.9.2, 4.9.3, 4.10.1, 4.13.1, 4.14.1
Heron	John		11	4.1.3, 4.3.1, 4.10.1
Carrall	Malcolm		12	4.9.1, 4.9.2, 4.9.3, 4.11.1
Wade	Adele		13	4.1.4, 4.5.4, 4.8.3
Carrall	Roma		14	4.1.1, 4.1.4, 4.5.4, 4.6.1, 4.8.4, 4.9.1, 4.9.3, 4.10.1, 4.11.2, 4.13.1, 4.14.1
Dash	Alan	The Australasian Native Orchid Society Inc.	15	4.1.4, 4.8.3, 4.8.4
Carter	Kevin	Bulahdelah & District Historical Society Inc	16	4.1.1, 4.1.2, 4.1.3, 4.2.2, 4.5.4, 4.6.1, 4.8.2, 4.8.3, 4.8.4, 4.9.1, 4.9.2, 4.9.3, 4.11.2

Surname	Given Name	Organisation	Rep #	Section Where Issues are addressed in this Report
Stobbart	F & L		17	4.1.3, 4.3.1, 4.10.1, 4.14.1
Carrall	Malcolm		18	4.1.4, 4.5.1, 4.8.2, 4.8.3, 4.9.3, 4.11.2, 4.14.1
Longworth	Jennie-lyn		19	4.1.1, 4.1.4, 4.2.2, 4.5.3, 4.5.4, 4.6.1, 4.8.2, 4.8.3, 4.10.1
Smyth	Gwen & Mark		20	4.1.1, 4.1.2, 4.1.3, 4.1.4, 4.2.2, 4.5.1, 4.5.3, 4.5.4, 4.8.3, 4.11.2, 4.12.2
Wade	Adele		21	4.1.1, 4.1.3, 4.1.4, 4.5.3, 4.8.4, 4.10.1, 4.11.2, 4.14.1
Richards	B.D & S.J		22	4.1.3, 4.3.1, 4.5.2
Mitchell	Lisa	Department of Planning (the then DIPNR)	23	
Keats	Jaqui	Great Lakes Environment Association	24	4.2.1, 4.2.2, 4.1.3, 4.3.1, 4.5.4, 4.8.2, 4.8.3, 4.13.1, 4.14.1
Graham	Mark		25	4.1.3, 4.8.3, 4.8.4, 4.8.5
Davey	Greg	NSW Department of Primary Industries	26	4.4.2, 4.6.1, 4.7.1, 4.8.1, 4.13.1
Pralica	Victor		27	4.1.4, 4.10.1
Graham	Jeff	Bulahdelah Golf Club Limited	28	4.1.3, 4.3.1, 4.11.1
Patteson	Christian		29	4.1.4, 4.4.1, 4.5.3, 4.5.4, 4.8.3
Davey	Gary	Department of Environment and Conservation (NSW)	30	4.4.1, 4.4.2, 4.6.1, 4.7.1, 4.8.2, 4.8.3, 4.8.4, 4.8.5, 4.9.2, 4.10.1, 4.12.1, 4.12.2, 4.13.1, 4.14.1, 4.15.1, 4.15.2, 4.16.1
Morrison	Martha E		31	4.1.1, 4.1.4, 4.2.2, 4.5.4, 4.8.3, 4.9.2, 4.9.3, 4.10.1
Carter	Kevin B		32	4.1.1, 4.1.2, 4.1.3, 4.1.4, 4.5.4, 4.8.2, 4.8.3, 4.8.4, 4.9.1, 4.9.2, 4.9.3, 4.11.2
Gordon	Barbie		33	4.1.4, 4.5.3, 4.11.1
Jeayes	John	North Coast Environment Council Inc.	34	4.1.1, 4.1.3, 4.1.4, 4.2.1, 4.5.3, 4.5.4, 4.8.2, 4.8.3, 4.8.4, 4.9.2, 4.17.1
Adam	P	Coast & Wetlands Society Incorporated	35	4.1.1, 4.1.3, 4.1.4, 4.8.3
Diesendorf	John	Transgrid	36	4.16.1, 4.16.3
Carrall	A		37	4.1.4, 4.2.2, 4.5.3, 4.5.4, 4.6.1, 4.8.3, 4.9.3, 4.10.1, 4.11.2, 4.13.1, 4.14.1, 4.15.2
Faehrmann	Cate	Nature Conservation Council of NSW Inc.	38	4.1.1, 4.1.2, 4.1.3, 4.1.4, 4.5.3, 4.8.3

Surname	Given Name	Organisation	Rep #	Section Where Issues are addressed in this Report
Seah	Erin	Urbis JHD	39	4.2.1
Morphett	Ian	The Myall Koala & Environmental Support Group Inc.	40	4.1.1, 4.1.3, 4.1.4, 4.3.1, 4.8.3
Patteson	Christian		41	4.1.2, 4.4.1, 4.5.3, 4.5.4, 4.8.3
Guiney	Brendan	MidCoast Water	42	4.12.1, 4.13.1, 4.14.1, 4.16.2, 4.16.3
Dorney	Anthony		43	4.1.4, 4.3.1, 4.4.2, 4.5.3, 4.9.1
Fawcett	Adam	Forests NSW	44	4.1.1, 4.1.4, 4.5.1, 4.5.3, 4.5.4, 4.8.3, 4.8.5, 4.11.1, 4.15.1, 4.15.2
Tattersall	Carol & Les		45	4.5.3, 4.5.4, 4.8.3, 4.14.1
Barnes	R G	Mineral Resources Division, Department of Primary Industries	46	4.3.1
Sicari	Vincent	NSW Heritage Office	47	4.9.1, 4.9.3

4.1 Planning Process and Justification

4.1.1 Disagree with Route Selection Process

In summary the respondents to the EIS and SIS raised the following issues:

- Option E is not the right route, as the composite of all of the individual impacts add up to an overwhelming significant and long-term impact that should be considered unsustainable. The RTA should proceed other than by Option E.
- The project is still in the planning phase, and Option E should not be adopted just because so much work has been done to date.
- There is opposition to the re routing of the highway, other than to the west of town.
- The preferred option has been rejected by upwards of 85% of the residents of Bulahdelah according to a number of informal surveys. Many letters have been written objecting to Option E since October 2000, to no avail.
- Bulahdelah needs a bypass, but in the manner that the objectives put forward in S.9 of the Summary Book outline. The RTA has not seriously considered any option but Option E.
- The Proposal does not fulfil any of the adopted Proposal objectives for the Pacific Highway Upgrade as stated in the Main Volume, Chapter 8.4.
- The real Proposal of a six-lane highway makes the EIS irrelevant as all environmental considerations in relation to clearing, pollution, orchid translocation, and percentage impact are voided.
- The aims of the upgrade in relation to accessibility are not met because the accessibility of Option E is no better than any other option suggested.

- After extensive consultation with all stakeholders, the preferred option of the community was discarded, and the RTA selected the worst environmental choice as the preferred option. The preferred community option should be revisited.

Submission Numbers:

1, 5, 7, 9, 10, 14, 16, 19, 20, 21, 31, 32, 34, 35, 38, 40, 44

Response:

There is some community opposition to the preferred route being adopted and the proposed Upgrade being developed based on that route. There have been reports of an informal local school survey been undertaken, but the methods and results have not been made available. Surveys conducted during the route selection process indicated that there was a generally equal split between preferences for eastern and western route options.

Community comments from the surveys, meetings, displays and other project inputs were summarised for a Value Management Workshop (VMW), which was held on 29 and 30 August 2000. This was a structured process designed to allow stakeholder input into the consideration and assessment of the five route options. The workshop attendees represented a broad range of people from within the community, government departments, Great Lakes Council, the Karuah Aboriginal Land Council and industry groups. Nominees from the Community Focus Group attended the workshop. Participants undertook a systematic analysis of the route options and other possible options. Route selection criteria and performance measures were determined and the eastern option recommended for further consideration and refinement by the project team.

Input to the route selection process was also contributed by community members and groups, including residents who were opposed to the value management workshop outcomes. Additional community comment on route options was provided at a community information night organised by members of the Community Focus Group and Bulahdelah residents.

It is considered that the initial route evaluation and selection process was valid and that subsequent findings of the environmental impact assessment do not warrant the discarding of the preferred route and another route evaluation and selection process being initiated.

As detailed in Section 4.5.2 of Technical Paper 3 – Need and Route Evaluation, Options A and E were very close across a range of criteria. However, the identified advantages of Option E over Option A are that Option E:

- Is closer to town, providing enhanced opportunities to attract passing trade and visitors, and supporting the concept of Bulahdelah as a highway service town;
- Provides opportunities to improve town drainage;
- Provides opportunities for a whole-of-town focus and urban design enhancement;
- Is shorter, which has construction program benefits and reduced impact on the natural environment;
- Incorporates the new road infrastructure to the north;
- Has a higher road user benefit–cost ratio;
- Has fewer impacts on potential sites of Aboriginal cultural significance;
- Has fewer impacts on prime agricultural land and rural enterprises; and
- Minimises potential environmental impacts on local drinking water catchment.

Several disadvantages of Option E over Option A were also identified, but it was considered that these disadvantages could be reduced or minimised through appropriate design, environmental safeguards and environmental management.

Route evaluation and selection was based on a comparative assessment of route alternatives and is described in section 4.1 of the Main Volume of the Environmental Impact Statement (EIS), and detailed in Technical Paper 3, Volume 2 of the EIS. The route evaluation and selection process began in March 2000, and involved extensive community consultation and technical investigations. A large number of options were assessed across a wide study area, based on project objectives, evaluation criteria and performance measures.

Section 8.2 of the Main Volume of the EIS provides a detailed discussion on how the proposed Upgrade at Bulahdelah meets the project objectives. The justification outlines the positive and negative impacts, as well as the benefits and disadvantages that would result from the proposed Upgrade. The Proposal meets the Upgrading the Pacific Highway objectives and would result in net benefits to the community, despite a number of negative impacts on the local economy and the environment.

The concept design development and environmental impact assessment were conducted for a four-lane upgrade with a median width with a capacity to accommodate two additional lanes in the future. It is estimated that a four-lane upgrade would have sufficient capacity until 2028. The future upgrading to six lanes (subject to a separate environmental impact assessment) would not result in any additional impacts outside the construction footprint described in the EIS, as the upgrade would utilise this median for widening.

The objectives of the Upgrade in relation to accessibility are to maintain or improve accessibility within Bulahdelah and surrounding areas. As stated in the EIS, following quantitative and qualitative assessment, Options A and E were similar in satisfying this and other key objectives. The importance of access to Bulahdelah for highway traffic, to support the concept of Bulahdelah being a highway service town is an important criterion for assessment. Although access to Bulahdelah is comparable with Options A and E, Option E provided a number of advantages over Option A, as listed in Section 4.1.3 of the EIS.

One important value of the proximity for Option E lies in the presence of significant visual cues which are available to the motorist in advance of the decision point for the exit points on this option. These cues include direct views of Bulahdelah (Alum) Mountain for northbound traffic and the Bulahdelah Golf Course for southbound traffic. While some views of Bulahdelah (Alum) Mountain and the township are available from Option A, they are side views that occur well after the decision point for the exits have been passed.

A value management process involving community and stakeholder representation, recommended that Option E be adopted as the preferred route. It is acknowledged that Option A was considered to have very similar positive and negative impacts, advantages and disadvantages. However, the comparative assessment of short listed options identified Option E as having the highest relative performance in achieving socioeconomic and financial outcomes, which was a central issue for members of the local community. Option E was later endorsed by the Great Lakes Council and other local community groups. The preferred route was announced by the Minister for Roads in November 2001.

In light of community concerns raised with the Minister for Roads by the Through Town group, a review of through-town options was conducted in 2002. The conclusion of this review confirmed that through-town options would have significant adverse impacts on Bulahdelah. Following on from the results of this review and discussions with the Through

Town group, it was decided by the group in July 2004 that there was no value in undertaking further work in relation to these options.

The concept design development and environmental impact assessment phase, based on the preferred route, commenced after the announcement by the Minister for Roads in November 2001. The adverse impacts identified during this detailed design and investigation phase can not be compared to those that were identified during the route evaluation phase, as there is a more intensive level of investigation of the preferred route during the latter phase which has not been undertaken on the other route options.

4.1.2 Disagree with Economic Justification for Route Selection

In summary the respondents to the EIS and SIS raised the following issues:

- The Proposal is a victory for business interests over environmental awareness and aesthetics.
- Options B, C and D are shorter in distance, therefore it is not clear as to why Option E can be justified as better for encouraging travellers to stop.
- The socio-economic concerns of Option A are no greater than Option E, as the turn offs to town require the traveller to have a predetermined plan to enter Bulahdelah, the same as Option E.
- In the context of the justification for Option E providing enhanced opportunities to attract passing trade and visitors, the access roads and interchanges for Option A and B are located at very similar distances from the town.
- Option E was chosen on the ability for passing traffic to sight the town from the route and then have the ability to exit the highway, and come into town near the current Shell Roadhouse. After detailed design, Option E has moved dramatically away from the community's expectations to deliver a socio-economic benefit.
- The decision to skirt the highway close to Bulahdelah (Alum) Mountain is not an economically detached assessment as most input into route selection came from those with a financial bias.
- The proclaiming of Bulahdelah (through zoning amendments) as a service town by Great Lakes Council ensures that there would be no competing business houses at either end of the bypass, and hence no socio-economic concerns as previously considered.

Submissions:

5, 16, 20, 32, 38, 41

Response:

The achievement of socio-economic and financial outcomes was one of several key objectives used in the route selection process outlined in Chapter 4 of the Main Volume of the EIS. Route selection was also based on extensive community and stakeholder consultation, across a range of interests. This included consultation with individual businesses, the broader business community through the Bulahdelah Chamber of Commerce, as well as the customers who traded with those businesses. The comparative assessment of short-listed options identified Option E as having the highest overall performance in achieving socio-economic and financial outcomes.

The length of the short listed route alternatives is not a measure of the ability to attract travellers to stop in Bulahdelah. Option E has benefits over other options in relation to

attracting travellers to stop in Bulahdelah. These benefits include the fact that the town or key visual cues would be visible to travellers on the proposed Upgrade prior to the time when they had to make the decision to enter the town. This option also provides opportunities for efficient access to the town.

While it is acknowledged that a predetermined plan is important in a traveller's decision to enter a bypassed town, members of the local community also highlighted the importance of visual cues at the point of decision.

The orientation and location of the southern and northern interchanges of Option E provide the best opportunities to encourage travellers on the proposed Upgrade to stop at Bulahdelah. The southern interchange maximises views of Bulahdelah (Alum) Mountain for motorists approaching from the south, and provides time for drivers to exit at the interchange. The Bulahdelah golf course provides a visual cue for travellers from the north, and similarly allows time for drivers to decide to exit safely at the interchange.

The interchanges for the other route alternatives do not provide these opportunities due to their location or the lack of suitable visual cues. In particular, the interchanges for Option A would be located further away from Bulahdelah, and the direction of travel would have been oblique to the direction of the town, without direct views of the town or Bulahdelah Mountain.

Views to Bulahdelah (Alum) Mountain and the town from a proposed Upgrade to the west of the town are feasible across the Crawford and Myall Rivers. However, the traveller would have already passed the most direct opportunity to exit the highway, the southern interchange.

At the time of route assessment, it was proposed to have a single centrally located interchange. However, due to environmental constraints such as threatened species, and the proximity of this interchange to existing homes and a school, the central interchange was not pursued further. An overview of the assessment of the interchange configuration is provided in Section 4.2 of the Main Volume of the EIS. The provision of two interchanges with signs and other measures to enhance the use of Bulahdelah as a service centre was the most favourable alternative arrangement. The development of the concept design has been substantially influenced by the need to support the economic sustainability of the town. The change from the original interchange Proposal was supported and driven by community input. The proposed concept design would create fewer risks to economic activity in Bulahdelah than a more distant western option.

The route selection was a collaborative process, involving a range of interests from the community and other stakeholders. The importance of maintaining economic viability of Bulahdelah and the subsequent selection of the preferred route was an important consideration across a range of interests. Section 2.6 of Technical Paper I- Community and Stakeholder Involvement outlines the stages of consultation and development of the proposed Upgrade. A Community Focus Group (CFG) was established early in the process and was involved in the identification and assessment of options, and the selection of the preferred option. The CFG was comprised of volunteers from the community who nominated themselves following a call for nominations which was placed in local newspapers. At the first meeting, the members were asked whether the representation was fair and equitable so that others may be invited to participate.

The CFG provided input into the route investigations and evaluation. Members nominated from the Group participated in the Value Management Workshop, along with a number of

other stakeholders, including participants with no affiliation with the Bulahdelah area. The recommendation from the participants was that Option E be carried forward for further assessment.

Membership of the CFG was re-opened following the announcement of the preferred route, with another round of nominations invited in newspaper advertisements. Twelve new members joined the group at this stage.

The proposal of Great Lakes Council to proclaim Bulahdelah as a service town is an additional measure to support the economic viability of the town, and enhance those economic measures included as part of the proposed Upgrade of the Pacific Highway. This initiative was sought and encouraged by the local community as an additional measure during the consultation process.

4.1.3 Opposition to Route Selection due to Environmental Impacts

In summary, the respondents to the EIS and SIS raised the following issues:

- The recognised worst option for the environment has been chosen as the preferred route. There has to be more effort to find a different route.
- Complete opposition to Option E based on the range and significance of environmental impacts.
- Option E would destroy Bulahdelah's most significant heritage and the type location of the Eastern Underground Orchid. The environmental considerations raised with Option E were only given perfunctory attention.
- No mitigation measures can lessen the destructive potential of Option E. It is the worst possible choice for the environment.
- It is environmental vandalism to encroach on Bulahdelah (Alum) Mountain, and it is not too late to change these poor decisions.
- Given the number, extent and significance of the consequences of building Option E the result is an environmentally significant impact, and it should therefore be scrapped.
- There are strong reservations about Options A and B, in which further studies could well establish problems with fauna populations and possibly similar flora communities to those found in Option E.
- The largest population of the Commonwealth EPBC Act 1999 listed Leafless Tongue Orchid, the internationally significant population of the Eastern Underground Orchid, and the newly discovered State significant Red Helmet Orchid are sufficient grounds to remove Option E from consideration as a viable route option. A route to the west of town or through town itself would create a far lesser ecological impact.

Submissions:

5, 7, 10, 16, 20, 21, 25, 32, 34, 35, 38, 40

Response:

At the route evaluation and selection phase, the selection of the preferred route was based on a comparative assessment using a number of evaluation criteria and performance measures, including measures related to environmental quality and sustainability. At this time, Option C was determined, on the grounds of environmental quality and sustainability, to be the worst option. The preferred route was adopted following community input and consideration of environmental, social and economic performance measures and criteria, and subsequently announced by the Minister for Roads in November 2001.

Consultation activities have indicated that while there is a wide range of opinions about the Proposal, there is general support for the Proposal in its current form within the broader community. A number of key stakeholders such as the Karuah Local Aboriginal Land Council and the Great Lakes Shire Council have indicated support for Option E in preference to the other options.

The selection of the preferred route was based on the initial environmental assessment that covered all route options with a similar level of investigation. Following the selection of the preferred route, subsequent detailed investigations were focused on the environmental and other impacts of the preferred route at a much higher level than that undertaken for the route options. There have been extensive and ongoing additional investigations into the environmental issues, in particular threatened species and historical heritage along the preferred route. These investigations have identified a number of issues, some additional to those identified in the route evaluation phase. However, they have also allowed for the development of refinements to the alignment and concept design, and other mitigation measures to a level where residual impacts are considered acceptable.

There would be environmental impacts resulting from the development of other options that were evaluated at the route selection phase, in particular Option A. Most notably, Option A and B would require the fragmentation of an area of contiguous, high value habitat to the northwest of Bulahdelah. This area of land is vacant Crown land and is currently being reviewed as to its long-term management and ownership. A population of *Cryptostylis hunteriana* (a nationally significant orchid species), along with a number of other threatened species have already been identified in this area, northwest of Bulahdelah.

A route through town would create less ecological impact but would have a greater impact on the social environment, as discussed in the EIS.

4.1.4 Consideration of Other Options

In summary, the respondents to the EIS and SIS raised the following issues:

- It is not clear why Option E was chosen when Option A would not have affected on significant heritage sites or endangered species and would have no impact on the Mountain Park, or the lifestyle of citizens, nor any possibility of pollution affecting the two local schools during construction or operation.
- A western option could be located to only slightly impinge on the flood prone area and the town's water supply, as has been done at Raymond Terrace, without ill effects.
- Option A has a much greater scope to avoid any potential impacts, whereas Option E is in a very narrow corridor.
- Although the western route options bisect an identified wildlife corridor, the impacts of these options can be better mitigated by careful design and construction than the environmental impacts of Option E.
- Option D is the community's preferred route. Option E is a compromise, and while it is a suitable outcome, Option D would be a better choice for Bulahdelah.
- Bulahdelah should not be bypassed as it depends so much on passing trade.
- As there is a safer route – Option A, there is no justification for Option E.
- Any out of town option would also achieve the same travel efficiency gains as Option E.

- An option to the west of town would be far better, being safer, and taking the Highway away from, as opposed to directly above the township – An option to the west should be put through the EIS process.

Submissions:

7, 9, 13, 14, 15, 18, 19, 20, 21, 27, 29, 31, 32, 33, 34, 35, 37, 38, 40, 43, 44

Response

The first stage of route evaluation and selection investigated 14 options, including western, through-town, near eastern and far eastern options. Through an assessment of these options using agreed, multiple objectives, these were reduced to five options, named A to E from west to east. These included two options to the west, two through-town options and one near eastern option. The options assessment is described in Section 4.1 of the Main Volume of the EIS and in Technical Paper 3 – Need and Route Evaluation. Section 4.5 of Technical Paper 3 discusses the outcomes of the route selection process. It is acknowledged that Option A and Option E were difficult to separate, and had a range of advantages and disadvantages, which are outlined in Section 4.5.2. The selection of the preferred option was subject to input from the community and other stakeholders. Outcomes included:

- The value management study, which included participation from a wide range of community and other stakeholders, recommended that Option E be taken forward as the preferred route option, with some modifications that were subsequently adopted;
- Great Lakes Council formally endorsed Option E as its preferred route; and
- Karuah Local Aboriginal Land Council and Worrimi Nation Elders formally endorsed Option E as their preferred town bypass route.

On the strength of quantitative and qualitative assessment against program and project objectives, Option E was endorsed as the preferred option and subsequently announced by the Minister for Roads in November 2001.

Option E was announced as the preferred route in November 2001. Comparisons between the preferred route and previously discarded options following the environmental impact assessment phase is not possible because of the greater survey effort that has been applied to the preferred route. However, other options would also have adverse environmental, social and economic impacts. For example, threatened species and high value habitat has been found in areas to the north of Bulahdelah that would have been affected by both Options A and B. This area of land is a large, relatively undisturbed area that is in public ownership and is currently being reviewed as to its long-term management and ownership. Similarly, areas to the west of Bulahdelah would be anticipated to demonstrate more detailed environmental and heritage issues were they subjected to the same level of detailed investigation directed at the preferred option. Key stakeholders such as the Karuah Local Aboriginal Lands Council and DEC indicated a preference against the development of these western route options due to the issues identified in those areas during the route evaluation phase.

Both western options had the potential to significantly affect the town water supply and the flood prone areas associated with both the Myall and Crawford Rivers. The alignment of the Myall River and the location of the water supply weir are major constraints that restrict the alignment of both western options. As a result, neither option could be adjusted to remove the potential impact on either the water supply or the flood prone areas without a significant change in the length and location of these options.

However, impacts on flooding and town water supply resulting from western route options were just two issues considered in the route evaluation process. Investigations and

consultation indicated that there are important heritage, ecological, social and economic impacts likely to occur if western options were selected as the route for the proposed Upgrade. These include impacts on sites of indigenous heritage value, fragmentation and loss of undisturbed high conservation value habitat and threatened species, barriers to fauna movement corridors and less potential for supporting local economic activity.

There is no evidence to suggest that measures to mitigate impacts that may have resulted from the development of a proposal corresponding with route Options A or B would be more or less successful than those measures proposed in the current Proposal.

Initial investigations and an independent comparative assessment conducted as a result of concerns raised by the Through Town group are discussed in Section 4.5.3 of Technical Paper 3 – Need and Route Evaluation. Assessment showed that Options C and D performed poorly in relation to environmental quality, socio-economic and financial outcomes. Further, the conclusions from this independent technical review were:

- The negative impacts of through–town options considered in the route evaluation process were probably underestimated.
- Option C could not be practically modified to mitigate the negative impacts to an acceptable level.
- Any through–town route would have significant adverse impacts on Bulahdelah.

Following the completion of the comparative assessment, it was acknowledged by members of the group that while the options discussed closely reflected the group's suggestions, they contained some major issues that would be difficult and costly to overcome. Those issues included noise, access from east to west, impacts on schools, pedestrian access, heavy vehicle movements and property impacts. As a result it was agreed by all involved in the group that there would be no value in undertaking further consideration of these through town options as they do not give the best outcome for all stakeholders.

The detailed environmental impact assessment (EIA) under the *Environmental Planning and Assessment Act 1979* is undertaken for a preferred route. The RTA's normal practice in line with the requirements of Schedule 2 of the *Environmental Planning and Assessment Regulation 2000* involves an analysis of feasible alternatives prior to the selection of the preferred option and undertaking the detailed environmental assessment (including the detailed design) for the proposal. This analysis of alternatives considered the objectives of the Pacific Highway Upgrade Program, as well as the consequences of not carrying out the Upgrade. The preferred option was selected after a range of investigations and community consultation in 2001, and a detailed concept design development and environmental impact assessment process conducted for a proposal using the preferred route. It is therefore not proposed to conduct an environmental impact statement on any alternative alignments to the west of Bulahdelah.

The concept design of the Proposal provides a safe and efficient Upgrade of the Pacific Highway. Its safety and efficiency is equal to that which would have been achieved for other out-of-town route options, as outlined in Technical Paper 3.

4.2 Consultation

4.2.1 General

In summary the Respondents to the EIS and SIS raised the following issues:

- Any further documentation that requires a response should not be put on display during the peak holiday period, as it reflects poorly on the RTA.
- Concern in relation to the composition of committees, where there is a bias towards the farming community over the environment.
- Further consultation is sought regarding the opportunity for Great Lakes Council to define the township of Bulahdelah as a highway service town in their Local Environmental Plan.

Submissions:

24, 34, 39

Response

The EIS was on display from 24 November 2004 until 28 January 2005. This is a public exhibition period of over 8 weeks, or 66 days. The required statutory period is 30 days. The substantial increase in the exhibition period was considered adequate to allow for difficulties in the public viewing and responding to the EIS during the holiday period.

A CFG was established using an open and transparent process. A call for nominations was placed in local papers and at the first meeting the need to include other suitable community members in the group was discussed. Membership was closed by the group at the second meeting. This group of approximately 35 local residents and business operators met 8 times during the route evaluation and selection phase.

The CFG re-opened its membership following the announcement of the preferred route in November 2001. This was again advertised and all landowners directly affected by the Proposal were contacted. Twelve new members joined - predominantly landowners affected by the preferred option. An additional five meetings were held during the concept design and environmental impact assessment phase. The CFG held its last meeting 30 November 2004, during exhibition of the EIS.

Plans to define Bulahdelah as a highway service town in the Local Environmental Plan is the responsibility of Great Lakes Council.

4.2.2 During EIS Preparation

In summary the Respondents to the EIS and SIS raised the following issues:

- The consultation process described in the EIS is not entirely correct. The Focus Group is given more value in the EIS than the Exit Survey, which was supposedly an integral part of route selection.
- The manner in which the RTA conducted consultation was convoluted. The Community Focus Group (CFG) was only open to members of the community, at the start of the consultation process. The RTA ignored and impeded input from the community. There is therefore a need to establish with evidence the extent of local citizen support for Option E.

- The fact that Option E reached the EIS stage indicates that there was a failure to incorporate stakeholder and community issues into each phase of investigation, from the development of preliminary route options to the environmental impact process on a preferred route.
- No mention is made of the dissention at the meeting on 12 December 2001, in relation to Option E. At the site inspection on 31 August 2002 all attempts by opponents to Option E to voice concerns were dismissed.
- Information which shows Option E is geotechnically unsafe and Option A is the best option geotechnically was withheld from the community, even though the publication was titled “Geotechnical Issues for Community Information”.
- The appraisal meeting at Bulahdelah in March 2000 was well conducted by the RTA, and covered a broad spectrum of aspects surrounding the upgrade.
- Submissions could not be made via telephone, despite having provided a toll free telephone number.
- At no time was the Bulahdelah & District Historical Society Inc. consulted by either the RTA or Parsons Brinckerhoff, contrary to what is stated in various volumes of the EIS.

Submissions:

7, 16, 19, 20, 24, 31, 37

Response

The process of community involvement in the route evaluation and selection, concept design development and environmental impact assessment phases is described in Section 2.5.2 of the EIS, and in greater detail in Technical Paper I – Community and Stakeholder Involvement.

An Exit Survey was taken during the display of the five route options in July and August 2001. Forty seven surveys were received. In these surveys, the community was asked to nominate the criteria for making a decision about a preferred option. They were provided with a list of possible criteria and asked to nominate “most important”, “not very important”, and “least important”. The survey also asked people to nominate their preference. Some chose to provide comment in this way. Others provided more general comments.

A summary of responses to the Exit Survey was prepared for the Value Management Study. The main conclusions were that the response level is not statistically significant, respondents had a range of opinion and route preferences were relatively evenly distributed across western, through-town and eastern options. The survey showed a majority of respondents selected Option E as their preference, with lesser numbers choosing Options D, A, B and C respectively; but the responses were not used to justify a preferred option, only to build a picture of community issues and concerns.

The call for nominations from the community to join the CFG was advertised in local newspapers, promoted at a public meeting and in the first newsletter in March 2000, upon the commencement of the route evaluation and selection project. Membership on the CFG was open to everybody who nominated at the commencement of the project, and again once the preferred option was announced. All nominations were accepted in both cases, resulting in one of the largest Community Focus Groups operating at that time. Meeting times were openly discussed and arranged to suit the majority of participants, being after hours during week nights. Members of the community unable to participate because of

meeting times were able to participate in other ways, or contribute through the existing members of the Group.

Consultation with the community was an important part of the route evaluation and selection process. The CFG was formed early in the project, before route options were determined. The CFG was involved in the development and selection of route options from the beginning. The first newsletter did not show any options, as these were not determined at this time.

At the first CFG meeting 10 April 2000, the group discussed the need to include other suitable community representatives. It was then agreed by the 35 members of the group that membership to the group be closed. Closing the membership allowed the group to work together and develop a consistent understanding of the issues and process, without others coming in at different stages and not being aware of earlier discussions or outcomes.

The terms of reference for the CFG that were agreed by the group were:

- a) To represent local community groups and issues
- b) To share issues and concerns relevant to the project, as a cohesive group
- c) To be able to seek information from the Study Team about the investigations
- d) To provide input to the various studies required for the project
- e) To provide points of contact for the community to discuss the project
- f) To assist the project team in achieving the desired project objectives and represent the Bulahdelah community's input in evaluating and selecting the preferred route.

CFG meeting notes were provided at locations within Bulahdelah to assist other members of the community in staying aware of the discussions held within the group. The meeting notes did not record every discussion, or contributor to discussion, to encourage people to express their views openly. Therefore, they were called meeting notes after October 2000.

The CFG was established to bring forward issues and communicate those between the study team and the community. The RTA is responsible for the selection of the preferred route based on an assessment of a combination of social, economic and environmental criteria undertaken in consultation with the community. This process is not based on a vote by the CFG or the wider community.

The input from the CFG was an important contributor to selection of the preferred route. The CFG nominated and chose three of its members to attend the Value Management Workshop on the group's behalf. The Group also identified the key issues from their point of view for the representatives to raise at the workshop. On 29 August and 30 August 2000, the workshop brought together representatives from a range of government agencies, non-government organisations and the CFG for two days of assessment of the route options. The representatives agreed they were encouraged to voice the opinions and concerns of the Group (Minutes of Meeting No. 6, 18 October 2000). The outcome of the Value Management Workshop was that Option E be investigated further.

Stakeholder and community issues, values and concerns were an important part of the selection of the preferred route. Surveys, petitions and community input received directly, as well as through the Community Focus Group, were considered during route selection. All input from the community demonstrated a diversity of views about the preferred route. Much of the debate was concerning whether a through-town route or an eastern route was preferable. The debate centred on the need to maintain the economic viability of the town. There was little preference noted for the western option during the route selection process. The through-town option was re-assessed as a result of representations made to the

Minister for Roads, and subsequently discarded due the adverse environmental and socio-economic impacts.

The opposition to Option E by some members of the Community Focus Group (CFG) and some members of the wider community is acknowledged. It is acknowledged that such opposition was voiced at the Community Information Evening on 12 December 2001 and the Site Inspection on 31 August 2002. However, it is also relevant to note that no record was made of the people at these same meetings who either expressed support for the decision to adopt Option E as the preferred route, or requested that the RTA move on with the development of the project following the announcement of the decision. These attitudes were notable at the CFG meeting held the following evening on 13 December 2001 (see Appendix C of Technical Paper 1 - Community and Stakeholder Involvement), when the group decided to amend its terms of reference to include an objective to refine Option E, rather than rejecting it, and also discussed writing to the Minister for Roads to congratulate him on making a decision on the preferred route.

In the context of the issue relating to the geotechnical suitability of Option E, the letter from PPK referred to in this submission was in response to a letter from the respondent dated 1 June 2002 in which they refer to "a PPK/RTA employee or employees involved in the above testing have verbally revealed information regarding one of the results of this testing to some community members". The testing referred to by the respondent was the survey and seismic refraction testing undertaken in the early part of 2002. It is noted that the information referred to in that letter was "verbally revealed" in contrast to the "documentation" referred to in this submission.

It is also noted that the respondent's submission alludes to the results of the preliminary geotechnical investigations undertaken in early 2000 (their reference 'A' for pages 30 & 31 VMW Report), which would be out of context when compared to the more detailed geotechnical focused on the preferred route that were undertaken in 2002. The results of the earlier work referred to in the VMW Report looked at feasibility and the level of difficulty of the options from a geotechnical point of view rather than issues of comparative safety.

The RTA is unaware of a document related to this project titled "Geotechnical Issues for Community Information" which was dated in early or mid 2002. A document titled "Geotechnical Investigations: Seismic Refraction Tests" was released to members of the Community Focus Group and residents in the area where the seismic work was being undertaken in the early part of 2002 to explain the nature of the seismic testing work being undertaken (See CFG Meeting Notes 10 in Appendix C of Technical Paper 1 - Community and Stakeholder Involvement).

The process of checking information prior to release referred to in Mr Young's letter is a normal quality control required by the RTA and adopted by Parsons Brinckerhoff (formerly PPK) to ensure that incorrect or misleading information is not publicly released. As indicated in Mr Young's letter, all relevant information identified during the environmental impact assessment is made publicly available, either at appropriate times as the project investigations progress or as part of the Environmental Impact Statement for the project. It is also important to note that the results of the geotechnical investigations for the preferred route as described in Section 3.3.3 of Technical Paper 3 – Need and Route Evaluation indicate that no major geotechnical safety issues were identified on the preferred route.

The respondent's issues regarding the organisation of the appraisal meeting at Bulahdelah in March 2000 are noted.

Formal submissions to an EIS cannot be made by telephone. Clause 223 of the Environmental Planning and Assessment Regulation 2000 refers specifically to written representations. The 1800 project number was established to receive general enquiries from the community and allow issues to be raised for further consideration. This is the normal practice adopted by the RTA for all of the Pacific Highway projects.

Both RTA and Parsons Brinckerhoff staff were involved in a number of meetings at the Court House facility with people from Bulahdelah in the belief that they were associated with, or representatives of, the Bulahdelah Historical Society. At one such meeting at the Old Bulahdelah Court House with the "Say No to Option E" group on 12 December 2001, those attending requested a copy of a project report on the understanding that it was for inclusion in Historical Society records. The Heritage consultants were also involved in discussions with people who were believed to represent the Historical Society, for the purposes of information gathering and exchange during the development of the project. If this understanding was incorrect, then it is acknowledged that the EIS incorrectly states that there were meetings held specifically with the Bulahdelah and District Historical Society.

4.3 Support Proposal

4.3.1 Generally supportive of the Proposal

In summary the Respondents to the EIS and SIS raised the following issues:

- Support for the Proposal as it would provide positive benefits for motorists and cyclists while maintaining the commercial interests of Bulahdelah. Appropriate measures should be implemented to address concerns with flora and fauna protection.
- The manner in which the RTA has approached the Proposal is appreciated, and commended.

Submissions:

2, 4, 8, 11, 17, 22, 24, 28, 40, 43, 46

Response:

The supportive comments for the Proposal and the concept design and environmental impact assessment process are noted. The measures proposed to mitigate impacts on flora and fauna would be implemented as described, subject to further development and refinement.

The respondent's comments regarding the manner in which the RTA has approached the Proposal are noted.

4.4 Project Design

4.4.1 General

In summary the Respondents to the EIS and SIS raised the following issues:

- The final alignment and footprint are subject to further clarification, including contractor input. All constraints should be incorporated into the design development phase to ensure that the environmental impacts are identified early and minimised.
- In Section 5 of Technical Paper 7 residual impacts are also included within this assessment. It is important to develop procedures to ensure that these are identified and managed correctly. There are a number of concerns when additional "residual" impacts often develop during construction. This tends to result in works (and subsequent impacts) which were not envisaged during the EIA phase then becoming essential works.
- Table 4.10 in Technical Paper 4 - The Proposal, shows that the informal track on Crown Land would be closed as part of the Proposal. This track continues into an area, which is proposed for a change in land tenure in the near future, and that long term management requirements in light of the proposed land tenure (including fire management requirements), need to be considered. Clarification needs to be provided on the long-term access arrangements for this area.
- The need for a cutting up to 24 metres deep at the base of Alum Mountain is not a minimal impact on the environment and is therefore unacceptable.

Submissions:

5, 29, 30, 41

Response:

All environmental and other constraints to the alignment and footprint would be compiled before the development of the detailed design to ensure they are considered early and included in the detailed design.

Standard monitoring procedures (audits) would be conducted regularly to identify environmental impacts not identified during the environmental impact assessment of the Proposal that may emerge during construction. Measures would be implemented in a timely way to prevent environmental impacts as they emerge. Section 6.3 of Technical Paper 5 – Environmental Management Framework provides an outline of those commitments made in relation to environmental auditing during and after construction.

The informal track on Crown Land identified in Table 4.10 would be closed at its southern end where it would meet the proposed Upgrade boundary. Access to this area and to the northern end of the informal track would be maintained via the access road to the waste facility and sewage treatment plant. Reinstating access to the local road network from the southern end of this track would be difficult due to the topography and the potential impact on threatened species in this area.

The proposed cutting with a depth of approximately 24 metres adjacent to Bulahdelah (Alum) Mountain is required to meet road design criteria. The proposed cutting is in a location that minimises environmental and social impacts. It is considered that any residual adverse impacts that the highway footprint has in this location can be adequately mitigated.

The opportunity for further reduction of the impacts resulting from this cutting by adjusting the cut batters may be available if favourable geotechnical conditions are encountered during the detailed geotechnical investigation and design phase in this area.

4.4.2 Intersections and Bridges

In summary the Respondents to the EIS and SIS raised the following issues:

- Bulahdelah would not be visible from the highway at the southbound exit to the town. A second southbound exit at the southern interchange, or an additional centre interchange would allow entry into the town for those that miss the first exit without having to travel several kilometres south of the town before turning around.
- Detail of bridge height for crossing of Myall River is requested. A height 10m above mean high water mark would be amenable to certain recreational needs (sailing).
- The RTA needs to retain the natural substrate of Frys Creek and clarify whether any bunding or blocking of the channel would occur during construction. Concern is expressed over the implementation of 1:2000 year flood protection for bridge structures during construction, as this often results in full creek realignment. The RTA needs to ensure that the length of bridge crossings is adequate to address concerns over structure protection.
- The suggestion to leave in place the roots and stump of the large remnant tree on the northern banks of the Myall River needs to be incorporated into the design.
- The use of a barge for access and/or a barge-mounted crane during construction of the Myall River Bridge is preferred. If a temporary work platform is required, this should be a temporary wharf or pier structure, instead of a rock fill platform.

Submissions:

4, 26, 30, 43

Response:

Clear signposting and the Bulahdelah Golf Course would provide southbound drivers with adequate cues to exit to Bulahdelah at the northern interchange. The addition of a southbound exit to Bulahdelah at the southern interchange is not justified. An additional central interchange is not feasible due to the significant environmental and social impacts that would result at this location. It is intended that U-turns be provided at approximately 3 to 5 kilometre intervals, and in accordance with the Road Design Guide (Roads and Traffic Authority 1988), therefore providing an opportunity for southbound travellers who may have missed the southbound exit at the northern interchange.

The Myall River bridge has been designed to provide clearance of 9 metres from mean water level to the bottom of the bridge deck. This height has been determined through consultation with NSW Maritime Authority and is considered adequate to maintain access beneath the bridge by most sailing craft likely to use this section of the river.

The bridge at Frys Creek would be designed so that scour protection of the bridge in the event of a 1 in 2000 year flood event would not require Frys Creek to be realigned. The natural substrate of Frys Creek would be retained as much as possible. Any need to temporarily block the Frys Creek channel during construction would be of a temporary nature and undertaken in consultation with DPI, although there is no indication of a definite need for such a blockage.

The retention of the roots and stump of the large remnant tree on the northern bank of the Myall River would be included in the design description.

It is very difficult to assess all the issues in building a bridge in advance of the work and temporary rock fills are sometimes necessary on each of the two banks, using environmentally best practice techniques such as rock materials and wrapping in geotextiles. The weight and size of piling equipment and cranes necessary for constructing the bridge foundations and deck cannot be determined until detailed geotechnical and design information is available. Cost, safety, Workcover, water depth/ barge manoeuvrability issues are also important considerations. The RTA wants to avoid roll overs of equipment from a point of view of potential environmental impacts, delay, cost and operator safety. Methods such as barges, with barge mounted cranes or temporary wharf or pier structures would be assessed, but may not be the most suitable option considering the above issues. Depending on the outcomes of an assessment of all of the available options, including a rock fill platform if suitable on the banks, the proposed approach would be discussed with appropriate regulatory agencies prior to implementation.

4.5 Community Impacts

4.5.1 Visual

In summary the respondents to the EIS and SIS raised the following issues:

- It would be better to have the view of the mountain as a landmark to the approach of the town, as with Option A. Option E would have visibility issues regarding the town and Bulahdelah (Alum) Mountain.
- Option E would have visual impacts on Bulahdelah and also the rural nature of the town, which could be largely destroyed.
- The aesthetic values of Bulahdelah are the mountain and the river. Positioning the road at the foot of Bulahdelah (Alum) Mountain would detract from these aesthetic values.

Submissions:

18, 20, 44

Response:

The proposed alignment and concept design was developed to optimise direct views of Bulahdelah (Alum) Mountain and some aspects of the town in advance of the interchange for northbound travellers, thus allowing them adequate time to make a decision to stop and take advantage of services provided in the town. The western route options such as Option A would only have provided side views for northbound travellers after they had passed the most convenient interchange option. While there is very little opportunity to provide southbound travellers with direct views of the town and mountain in advance of the interchange, the preferred route does allow for views of the Bulahdelah Golf Course near the northern interchange that would not be seen from Option A.

The visual impacts of the proposed Upgrade have been assessed as part of the environmental impact assessment (refer Section 7.5 of the Main Volume, and Technical Paper 12). Views of the Proposal from the town would be generally limited to the northern end of town where the alignment emerges from existing native forest, approximately where the Proposal crosses the existing access road to the water reservoirs. Views of this section

of the Proposal would be screened by deliberate landscaping techniques. There would be substantial visual change at the northern approaches to Bulahdelah. The northern interchange and associated cuttings would also be visible from parts of Bulahdelah, and there would be a loss of visual amenity at the Bulahdelah Golf Course. Extensive landscaping would be undertaken to minimise visual impacts. It is not expected that the Proposal would substantially change the rural visual nature of the town.

The high aesthetic value of Bulahdelah (Alum) Mountain and the Myall River at Bulahdelah has been recognised in the development of the concept design. The alignment and southern interchange location have been selected so that views of the Mountain and River are maximised for the highway traveller, as well as retained for local residents, by taking into account urban design principles, the viewscape of the locality, and providing for an extensive revegetation strategy.

4.5.2 Property Impacts

In summary the respondents to the EIS and SIS raised the following issues:

- The road going from the northern interchange to the water reservoir has a loop on the eastern side of the 110V transmission line that would have direct impacts on property. The road should be realigned to the western side of the transmission line.
- Without enough information with regard to the exact location of the access road and boundaries this information, a decision can not be made on the effects on Bulahdelah Golf Club.
- By locating Option E on the highest ground, the best real estate Bulahdelah has would be ruined.

Submissions:

6, 10, 22

Response:

The design of the northern interchange connection for the link road with the water reservoirs would be reviewed to provide as much clearance from the residence as possible given applicable heritage, environmental and design constraints.

The extent of land acquisition and impact on Bulahdelah Golf Course and other properties would be more accurately defined following the approval of the project during the detailed design phase. The detailed design of the access road to the waste facility and sewage treatment plant would consider the minimisation of the impacts on Bulahdelah Golf Course.

The alignment has been selected so that it maximises distances away from property and residences, while minimising impacts on environmental and social features. Measures are proposed to mitigate impacts on property, such as noise walls and landscaping. The location of the proposed Upgrade and road connections was adjusted to minimise the potential impact on land that would otherwise be suitable for future real estate development. Less than 2 hectares of land zoned as Village in the Great Lakes Council Local Environment Plan, in private ownership would be affected by potential acquisition.

4.5.3 Tourism and Economics

In summary the respondents to the EIS and SIS raised the following issues:

- Bulahdelah (Alum) Mountain and Mountain Park are important components in Bulahdelah's tourism strategy and as a result of the impacts associated with Option E tourism would be reduced.
- An improvement should be made to the picnic area on the western bank of the Myall River; such as toilets and picnic shelters which are a necessity to attract travellers.
- The RTA is commended for new signage south of Bulahdelah at 15km, 10km and 5km, but it is requested that this is replicated on the northern side of the town. A distinctive entrance into Bulahdelah should also be placed high on the agenda.
- Option E does not achieve the aims of acceptable socio-economic and financial outcomes; tourist dollars would be lost from the town, as a result of impacts on the Alunite Mine Site Complex connected with Bulahdelah (Alum) Mountain.
- Bulahdelah's economy would suffer because of the distance from the proposed exit at the south of town, and drivers not being able to see the town while in the cutting. There would be employment and other related economic impacts.
- Locating the highway above the town of Bulahdelah would result in highway noise and toxic fumes that would not be a good financial outcome for the town. If the highway were moved away from town, a better result would be ensured.
- Any bypass of Bulahdelah would have a negative economic impact on the township, perhaps for many decades. The economic effect of bypassing Bulahdelah would be minimised if the RTA were not to issue access approvals off the highway to any new service centres within a specified distance of Bulahdelah.
- The potentiality of regional economic gain has not been established, nor have the benefits or maintenance of economic viability of the local area.
- The adoption of Route E would impact on Forest Management through the loss of timber resource.

Submissions:

7, 9, 10, 19, 20, 21, 29, 33, 34, 37, 38, 41, 43, 44, 45

Response:

Investigations have revealed that Bulahdelah is currently not considered to be a major tourism destination, relying more heavily on highway-related trade. Tourism in Bulahdelah depends largely on boating and recreational activities associated with the Myall River. The changes that would occur to Mountain Park and access arrangements to Bulahdelah (Alum) Mountain are not expected to reduce tourism activity in Bulahdelah. It is acknowledged in the EIS that there is some limited potential to increase tourism potential in Bulahdelah, but it is expected that Bulahdelah would continue to be dependent on its role as a service town for the Pacific Highway.

The provision of improved picnic facilities on the south-western bank of the Myall River, including toilets and picnic shelters, to attract travellers is the responsibility of Great Lakes Council. A number of town improvements have been discussed with Great Lakes Council, including improved pedestrian access to the south-western bank of the river. These are described in Section 5.7 of the Main Volume of the EIS.

Advance signage, both to the north and south of Bulahdelah would be installed on the new highway to inform motorists of Bulahdelah's location and services. In addition, Section 5.8 of the Main Volume of the EIS proposes a concept landscape design that includes gateway concepts that would further attract travellers to stop at Bulahdelah, and therefore take advantage of services within the town.

The National significance of the Alunite Mine Site Complex and Bulahdelah Mountain is acknowledged, and is discussed in Section 7.3 of the Main Volume of the EIS and in Technical Paper 16. Measures to mitigate impacts resulting from the Proposal have been included, which would maintain or enhance the tourism potential of the Mine Site Complex. The proposed Upgrade has been developed to minimise impacts on identified surface features, by being largely located within an area already disturbed by the existing powerline easement and associated track. However, it is acknowledged that the landscape setting would be altered, and a conceptual barrier created by the Proposal. It is proposed to enhance the heritage values of the area by improvements to Mountain Park, installation of interpretive signage and the inclusion of a pedestrian and emergency vehicle overbridge with a design and location that mirrors the location and function of the mine's now removed tramway. The proposed overbridge would be constructed with a distinctive steel truss that would serve to invoke the mining heritage of the area. It would therefore compliment the heritage values of the area and create a conceptual link within the precinct. It is also proposed that a Plan of Management be prepared in consultation with Forests NSW for the Alunite Mine Site Complex prior to construction activities, which includes measures such as reduced clearing of native vegetation and subsurface testing and salvage where required.

The future economic viability of Bulahdelah has been a substantial consideration in developing the proposed Upgrade of the Pacific Highway. The proposed alignment, the location of the southern interchange and its free-flowing design were developed to optimise views of Bulahdelah (Alum) Mountain and the town for northbound travellers, allowing adequate time for travellers to make a decision to stop and take advantage of services provided in the town. The travelling distance through town is marginally less than that using the proposed Upgrade. Advance signage would be installed to promote the convenience of Bulahdelah as a service town. It is considered that by the time northbound travellers are within the cutting adjacent to town, a decision not to enter Bulahdelah has already been made. Nevertheless, an additional northbound exit is available to the north of the cutting if the first opportunity is missed. It is acknowledged within the EIS that with a reduction in highway-related employment, there may be a reduction in the services available within Bulahdelah, such as the hospital and schools. However, it is also acknowledged that these impacts are hard to predict and quantify, and that a considerable effort has been made to limit these adverse impacts by promoting the ongoing highway service role of the town.

The proposed Upgrade alignment and concept design has been developed to maximise opportunities for a sustainable economic future for Bulahdelah, while considering other environmental and social impacts. Impacts such as noise and air quality have been considered and mitigating measures proposed where required. It is not considered that any environmental or social outcome of the Proposal would compromise those measures proposed to enhance economic opportunities.

It is acknowledged within the EIS that there would be a decline in economic activity for some businesses within Bulahdelah as a result of reduced highway related trade. Measures are proposed to maximise opportunities for Bulahdelah to act as a service provider to highway travellers. Great Lakes Council has developed a draft Great Lakes Highway Service Centre Strategy that aims to ensure that Bulahdelah and other towns dependent on servicing the Pacific Highway are protected against adverse economic impacts stemming from competing commercial developments.

The regional economic benefits of the Proposal are identified in the EIS, Section 6.2.5, and in Technical Paper 13. The results of the economic assessment of the Proposal show that the regional or national economic benefits of the Proposal are substantial, and would continue to generate substantial economic benefits even if construction and other costs increase. Conversely, it is acknowledged that there would likely to be a short to medium term decline in the local economy as a result of reduced highway-related trade with some local businesses. Measures have been included to minimise this as much as possible. Local government and communities also have a role in further enhancing local economic opportunities. It is expected, as traffic volumes on the Pacific Highway increase over time that the level of highway-related trade would also increase to levels currently experienced. While acknowledging that every town has its unique characteristics, previous Pacific Highway Projects, for example the bypass of Taree, have supported this assessment.

As stated in Section 7.4 of the Main Volume of the EIS, approximately 16 hectares of State Forest and adjacent Crown Land would be affected by acquisition, of a total contiguous area of about 206 hectares. This represents a loss of approximately 8% of the contiguous area of Bulahdelah State Forest. A portion of that requiring acquisition would be cleared for the powerline easement. While it is acknowledged that there is some loss of timber resource, the loss both locally and regionally is not considered to be significant.

4.5.4 Social

In summary, respondents to the EIS and SIS raised the following issues:

- Placing the highway in the proximity of the schools shows a poverty of vision and a lack of community concern. The distraction to students of the schools should be considered.
- Option E would have impacts on a substantial portion of Mountain Park, an area utilised by community and tourists alike. Severing the landscape connection to Bulahdelah (Alum) Mountain with the highway would erode the social and spiritual connection people have had, and will continue to have.
- Moving the highway from just below the school to above it is not an improvement.
- There would be three or four years of disturbance to students during construction, and later during operation.
- The school would no longer be able to utilise Mountain Park for school activities.
- State Highways should not be built close to schools if there is any other possible alternative.
- Option E conflicts with Great Lakes Council's best development plans for Bulahdelah.
- The Proposal would be to the detriment of intergenerational equity.
- Too little note has been made of the proximity of residences to the Proposal, as 60 metres is insufficient when considering the projected increases in traffic.
- The impact upon "a small number of residences" does not allow for increased subdivision activity following the expected commercial boom after completion of the Proposal.
- It is a nebulous argument as to how reducing town traffic by 90% would guarantee the commercial survival of the town.
- The section of river which is used by boaters would be affected by Option E.
- In the EIS Summary Book, health does not rate a mention in the listing of the values which are important to the community.

- A specification should be prepared ensuring that money allocated for the improvement of Bulahdelah be strictly adhered to by Council.
- The provision of direct access to the mountain for recreation should be considered.

Submissions:

1, 5, 7, 9, 10, 13, 14, 16, 19, 20, 29, 31, 32, 34, 37, 41, 44, 45

Response:

The location of the proposed Upgrade was selected by evaluating a large number of assessment criteria (Technical Paper 3), and involved input by members of the community and other stakeholders (Technical Paper 1). The selection of the route considered potential social impacts, like noise, severance from Bulahdelah (Alum) Mountain and the proximity to schools. The subsequent environmental impact assessment examined these potential impacts and where required, mitigation measures are proposed to minimise these impacts. The Proposal would result in improvements to the safety and amenity of the Bulahdelah community by removing the highway traffic that currently separates the schools and other services from the remainder of the town. Pacific Highway traffic would be further away from schools than it currently is, which would result in improvements in noise conditions at schools.

The loss of area from the Mountain Park resulting from the Proposal is not substantial, and improvements to the park facilities are proposed (Section 5.8.2 of the Main Volume of the EIS). The location of the Proposal at the foot slopes of Bulahdelah (Alum) Mountain is not expected to sever the landscape connection with the mountain, or the social or spiritual connection. The severance effects are mitigated by the inability of the Proposal to be seen from the town generally, hidden by the native vegetation and the natural topography. The severing of the town from Bulahdelah (Alum) Mountain by the Proposal would be reduced by the construction of the Mountain Access Overbridge adjacent to Mountain Park, approximately where the existing access to the mountain is located (Section 5.4.2 of the EIS). Severance impacts would be further mitigated by the provision of pedestrian access at Bombah Point Road and Stuart Street.

The proposed Upgrade would improve the amenity at Bulahdelah Central School and St Josephs Primary School, by improving noise conditions and air quality from that experienced if the Proposal was not to proceed.

Road traffic noise is discussed in Section 7.5.2 of the Main Volume of the EIS and in Technical Paper 14 – Noise. Noise at Bulahdelah schools currently exceeds noise criteria. The current and future noise levels without the proposed Upgrade would result in noise levels at the schools that exceed guidelines. Particular emphasis has been given to the schools, with construction, existing and future noise levels being examined. Noise mitigation measures are included as part of the Proposal. Noise levels at both schools would be improved by the operation of the proposed Upgrade as a result of Pacific Highway traffic being moved further away. The projected traffic noise levels at the school (external and internal) would be well within established government criteria.

During construction, Bulahdelah Central School and St Josephs Primary School are likely to occasionally experience noise levels above government criteria. A Noise and Vibration Management Plan would be produced by the contractor outlining noise mitigation measures to be applied during construction.

As stated in Section 7.5.2 of the Main Volume of the EIS and in Technical Paper 15 – Air, all air quality parameters would remain well within air quality goals, even within close proximity to highway traffic, and that air quality at schools currently adjacent to the existing highway would be improved by the operation of the proposed Upgrade.

While there may be some short term impacts on the Bulahdelah Central School and St Josephs Primary School during construction, in the longer term the project should have only minimal impact on the schools and their use of the Mountain Park facilities. The existing highway is located approximately 250m from the centre of the Bulahdelah Central School and 50m from the centre of St Josephs Primary School. The centre of these schools will be located approximately 450m and 400m respectively away from the proposed Upgrade. During construction every effort will be made to minimise impacts on either school with regard to noise and vibration, as well as access to the Mountain Park facility. When the upgrade is operational, views to the road and associated noise walls will be shielded from the schools by the existing vegetation barrier, as well as the proposed landscaping.

Mountain Park and tracks adjacent to it would be re-established as part of the Proposal, described in Sections 5.4.2, 5.8.2 and 7.1.2 of the Main Volume of the EIS. Mountain Park and informal tracks throughout the area would continue to be available for use by the school and wider public. The proposed highway road reserve would be fully fenced and pedestrian over or underpass facilities provided to ensure that pedestrian use of the area is not endangered by conflict with highway traffic.

The location of highways is guided by a large number of objectives, assessment criteria and performance measures, as outlined in Section 4.1 of the Main Volume of the EIS and Technical Paper 3. The decision making process for the Bulahdelah project is provided in the EIS. The Proposal is at least 200 metres away from the nearest part of the Bulahdelah Central School and St Josephs Primary School facilities, which is considered adequate to eliminate adverse impacts on the school student's health and comfort.

The Proposal does not impose any substantial restrictions on future development within Bulahdelah. The Proposal has been developed in close consultation with Great Lakes Council, and it is not inconsistent with any planning objectives Council has for Bulahdelah.

As stated in Section 8.2.3 of the Main Volume of the EIS, the proposed Upgrade has been assessed against the principle of intergenerational equity; where future generations are able to have the same or enhanced benefits compared to those that are enjoyed today. The Proposal was assessed against measures such as greenhouse gas emissions, consumption of energy, production of waste, demand on resources, and economic and social benefits resulting from improved access and improved road safety. Measures have been proposed to manage those adverse impacts on future generations. In comparison to the Proposal not proceeding, there is a net benefit to future generations. In particular, future generations would have safe and efficient access to employment markets, services and recreational opportunities.

The proximity of houses to the Proposal and the impacts on residents has been assessed within the EIS. In particular, traffic noise impacts on all residences in the proximity of the Proposal have been identified and mitigation measures proposed. In addition, assessments have been made and documented in the EIS in relation to visual amenity, access, land use, air quality, hazards and risks and residences and other sensitive receivers in the proximity of the Proposal. Currently conditions in Bulahdelah see residences subjected to highway traffic noise, associated decreases in air quality and local amenity. These impacts would be greatly reduced with the opening of the Proposal.

As stated within Section 7.6.2 of the Main Volume of the EIS, regardless of the proposed Upgrade improving the amenity within the town, it is unlikely that future demand would result in substantial increase in residential population due to the other restraints on the growth of Bulahdelah. The proposed Upgrade may result in a change in the sub-division potential of some land adjacent to the Proposal. However, this would be expected to be small due to the proximity of the Proposal to the existing highway, and the prevailing conditions within Bulahdelah. Additionally, any development that occurs after the proposed Upgrade would proceed with the knowledge of the upgraded highway in place.

Section 7.1.2 of the Main Volume of the EIS states that despite specific design and planning measures proposed to ensure continuation of Bulahdelah as a service town, through traffic is estimated to drop by about 90 percent when in operation. It is acknowledged that the operation of the Proposal is expected to have a substantial adverse effect on local business and result in some loss of local employment. However the Proposal has been located so as to provide encouragement for travellers to enter Bulahdelah which, when combined with related Council strategies, would reduce the impacts on the town from what they otherwise might be.

The bridge crossing the Myall River is in an area that is utilised by motorised and sailing boats. The bridge height and design has been developed in consultation with the Waterways Authority to provide for continued boating activities.

As discussed in section 3.2.2 of the Main Volume of the EIS, the values important to the community were identified through stakeholder and community consultation activities and assessment of social and economic effects. The values considered important to the community were identified as being access, amenity, natural and cultural heritage and economic sustainability. Health was not independently identified as an important community value, but as stated in the EIS, amenity encompasses the quality of the local environment and the effects that changes to amenity have on community health. In this regard, health was considered in the environmental impact assessment, particularly in relation to noise, air quality, water quality, road safety, hazards and risks.

The RTA has undertaken to contribute to town improvements listed within the EIS. These improvements have been discussed with Great Lakes Council who would implement the improvements. If the Proposal is approved, the RTA would contribute to these town improvements. However, the improvements themselves would be the responsibility of Council and would be subject to separate planning approvals.

Section 7.1 of the EIS identifies the proposed changes to access arrangements to Bulahdelah (Alum) Mountain. Recreational and emergency vehicle access would be provided at two locations; a pedestrian underpass adjacent to Stuart Street and a combined pedestrian/vehicular overbridge adjacent to Mountain Park.

4.6 Environmental Impact Assessment Content

4.6.1 Assessment Methodology and Documentation

In summary, respondents to the EIS and SIS raised the following issues:

- Red Helmet Orchids were affected on during the seismic testing, and saplings and trees were cut off leaving small stumps in the ground for people to trip over. Marking pegs and rubbish could be seen dumped where it was placed. What guarantee is there that the same would not occur during construction

- The Black-chinned Honeyeater was recorded in the study area; however Table 7.4 does not indicate this.
- The aerial photograph and topographic map (as per the Director General's requirements for the SIS) have not been included in Technical Paper 7.
- Table 2.3 of Technical Paper 7 notes that total survey effort was 111 person days; the figure should be 113 day when correctly added up.
- There is a contradiction between Figure J17 Section J2.17. This section indicates that the study area probably does not represent potential habitat for the Barking Owl, however Figure J17 indicates that most of the study area is potential habitat.
- The EIS states that Australian Bass is listed as a "commercial species" however Bass has been protected for years.
- The Acid Sulphate Soil high risk area on the flood plain south of the Myall River is not shown on the Key Biophysical Constraints map in Figure 3.6 of the Main Volume.
- Figure J25 of Appendix J (Technical Paper 7) does not include the historic record for this species (Eastern Grass Owl (*Tyto capensis*)) even though one exists in the southern part of the study area.
- The EIS is convoluted, and has glossed over important issues with many duplicating images.
- Insufficient consideration was given to the principles of ecologically sustainable development.
- Due to the quantity of impacts within the corridor, all attempts to avoid or mitigate impacts have encountered further impediments.
- Road user delay costs during construction of Option E compared with Option A should be mentioned in the Summary Document, "Justification and Conclusion"
- On page 149 of Volume 7 of the EIS, it states "Beryl's sister Joyce is pictured sitting on a wicker chair in the foreground". Joyce is Beryl's cousin, not her sister.
- The Summary Book incorrectly refers to the Bulahdelah Central School as the "Bulahdelah Primary School".
- Scott Street, the nearest to the Proposal, has been omitted from all maps in the EIS.
- Table K.1 provides extensive locality information. Please ensure that all this data/information is forwarded (in the correct format) to DEC.

Submissions:

5, 9, 14, 16, 19, 26, 30, 37

Response:

There would be strict controls on construction contractors to reduce unnecessary damage to native vegetation and littering during construction. These controls would include a Construction Environmental Management Plan in addition to RTA and Agency environmental inspections. Red Helmet Orchids would also be included in the Orchid Management Plan being developed.

It is acknowledged that Table 7.4 of the Ecological Assessment and Species Impact Statement, Technical Paper 4 is incorrect in not indicating that the Black-chinned Honeyeater was recorded in the study area during fauna surveys. This error does not affect the outcomes of the impact assessment. More detailed information about Black-chinned Honeyeater can be found in Section 8.8 of the Ecological Assessment and Species Impact Statement.

It is acknowledged that an aerial photograph and topographic map were not included in Technical Paper 7 – Ecological Assessment and Species Impact Statement. The insertion of these figures into the document at a scale that would be useful for examination would be impractical. A separate aerial photograph and topographic map have been provided to the DEC, Coffs Harbour, on 24 January 2005.

It is acknowledged that the calculation of the total terrestrial flora survey effort in the study area (Table 2.3 of Technical Paper 7 – Ecological Assessment and Species Impact Statement) is inaccurate. The total should read 113 person-days.

The statement within Section J2.17 and the associated Figure J17 are not contradictory. The document does suggest that the study area probably does not represent potential habitat for the Barking Owl. However, due to uncertainty and a precautionary approach, it does consider the impacts that may occur if the habitat was suitable for the species, and marks these areas of potential habitat in Figure J17.

It is acknowledged that in Section 3.4.5 it does incorrectly suggest that the protected species, Australian Bass is a commercial species.

It is acknowledged that there is an area of high risk Potential Acid Sulphate Soils (between 1 and 3 metres) not shown in Figure 3.6 of the Main Volume of the EIS. This area is a portion of the floodplain corresponding with the proposed alignment, approximately between Stations 95000 and 95500. The Acid Sulphate Soils Risk Map is shown in Figure 2.5 of Technical Paper 11 – Topography, Geology and Soils.

It is acknowledged that Figure J25 does not include an historic record of the Eastern Grass Owl. This single historic record exists in the southern part of the study area, immediately adjacent and to the east of the junction of Booral Road and the existing Pacific Highway.

The EIS has been prepared in accordance with statutory requirements, including the specific and detailed requirements of the Director-Generals of the DIPNR and the DEC. The EIS has been written to best explain a great deal of sometimes complex information, using figures, tables and photographs wherever deemed appropriate. The Main Volume has been written to provide a digest of the detail that is contained within the Technical Papers, and by necessity, there may be some repetition of photographs and figures.

The principles of ecologically sustainable development were considered throughout the development of the Proposal. Section 8.2.3 on the Main Volume of the EIS provides an explanation of how the four principles have been considered. Indeed, the preparation of the EIS itself helps to address the principles of ecologically sustainable development by providing detailed information about the proposal and enabling its public discussion in coming to a decision on whether it should proceed - and if so, subject to what commitments in relation to mitigating measures and environmental management.

It is acknowledged that there are a number of environmental, social and engineering aspects that were encountered during the route selection, concept design development and environmental impact assessment of the Proposal. However, through extensive, detailed investigations and application of avoidance and mitigating actions, the concept design has managed these aspects and impacts. The Environmental Management Framework and detailed mitigation measures is presented in Technical Paper 5.

Road user delay costs during construction were not stated explicitly in the Summary document. However, they are stated within the Main Volume of the EIS, in Section 6.4.1, and in Technical Paper 13, Section 5.2.6.

It is acknowledged that there has been an incorrect reference to the family relationship (cousin, not sister) stated on page 149 of Technical Paper 16 – Heritage.

It is acknowledged that there is an incorrect reference within Section S.8.5 of the Summary document to Bulahdelah Primary School. It should read Bulahdelah Central School.

It is acknowledged that Scott Street is not identified in figures within the EIS. Scott Street is parallel to Mackenzie Street, to the east. It is an unformed road north of Church Street.

A copy of the confidential Table K.1 has been forwarded to the DEC in the correct electronic format.

4.7 Construction

4.7.1 General

In summary, respondents to the EIS and SIS raised the following issues:

- Is there a proposed date for the start of work?
- During construction concrete batching plants, chemical storage facilities and site compounds need to be located in areas away from watercourses that would have a minimal impact on all aspects of the environment.
- When discussing the footprint of the project, ancillary activities such as haul roads and temporary occupation areas are generally not discussed in the EIS.

Submissions:

2, 26, 30

Response:

While no date has been set for the commencement of construction, joint media releases have been made by both the State and Federal Minister for Roads on 23 December 2005 and 3 May 2006 concerning the availability of funding for the project. The timing of construction would depend on factors such as the approval process, acquisition of land, contractual arrangements with constructors and funding arrangements. The local community would be informed prior to works commencing.

Location criteria for ancillary construction facilities are provided in Table 7.6, Section 7.9.1 of Technical Paper 4 – The Proposal. Several potential sites for ancillary construction facilities have been identified. Where possible, construction concrete batching plants, chemical storage facilities and site compounds would be located in areas away from watercourses and in areas that would have a minimal impact on all aspects of the environment.

Areas identified as potential sites for temporary, ancillary construction facilities were selected based on environmental and social impact location criteria (Section 7.9.1 of Technical Paper 4). In addition, they have undergone full environmental impact assessment. The study area for flora and fauna was within one kilometre of the Proposal. Heritage consultants surveyed the nominated ancillary areas in April 2004.

4.8 Biodiversity

4.8.1 Aquatics

In summary, respondents to the EIS and SIS raised the following issues:

- No snags should be removed from the Myall River. Snags should be relocated to enable bridge construction, while still maintaining fish habitat.
- Consideration should be given to the rehabilitation of wetland areas south of the Myall River after construction to improve the quality of habitat.
- Support would only be given to the removal of sand and gravel deposits from Frys Creek during the removal of old timber piles if the material has the potential to impact upon good quality aquatic habitat downstream. The DPI (NSW Fisheries) suggests that the material may be more useful for infilling of the holes left after the removal of the old timber piles.
- There is concern about the impact of rock armour and scour protection on fish and aquatic habitat. The extent of impacts and mitigation measures need to be included.
- Concern about the potential impacts on aquatic habitat from temporary crossings and temporary access platforms along the banks of Frys Creek for machinery, not mentioned in the EIS.

Submissions:

26

Response:

No snags would be removed from the Myall River, as proposed in Section 6.3.1 of the EIS.

Wetland rehabilitation would be undertaken as part of the Environmental Management Plan, for those areas within the road reserve directly affected by the Proposal. Wetland areas would be rehabilitated to a condition as close to existing as possible.

The removal of sand and gravel deposits at the Frys Creek bridge is proposed so to remove aquatic barrier effects, as discussed in Section 6.7 of Technical Paper 7 – Ecological Assessment and Species Impact Statement. As discussed, the removal of deposits would be considered after consultation with DPI NSW Fisheries. In addition, the infilling of holes left after the removal of old timber piles would be considered at this time.

The extent of rock armouring and scour protection at Frys Creek would be similar to that provided for the southbound bridge currently in operation, as discussed in Section 5.7 of Technical Paper 7. This rock armouring used would be the minimum required to protect the bridge footings. The toe of the armouring would be inundated during substantial wet weather flows and would have no adverse ecological effect. The rock armouring would likely provide flood refuge for small fish and invertebrates during flood events.

It is not proposed to block the Frys Creek channel during construction. If temporary crossings or platforms are needed in Frys Creek under the northbound bridge crossing, it would be undertaken so that water flow is not impeded. Temporary obstruction of fish passage would not be a serious concern, since there were only common species found in this area of the creek. However, some of the deeper upstream pools could possibly contain carp and bass, the latter requiring access to the lower estuary to spawn during winter (May to August), before returning upstream. Therefore, to safeguard against any obstruction to

fish passage, temporary crossings or platforms would be constructed and removed as required.

4.8.2 Fauna

In summary, the respondents to the EIS and SIS raised the following issues:

- The severing of the landscape would adversely affect wildlife corridors for threatened species, especially Squirrel Gliders and Koalas. The DEC suggests that the RTA, prior to awarding any contracts, investigates further measures to reduce fragmentation issues for gliders, including glider crossings, as these are still experimental in design and implementation. This is to ensure that there is no uncertainty when a construction contractor becomes involved. This has the potential to reduce long-term costs, project delays and unsuitable designs.
- The survey effort for Koalas was inadequate. The discovery of Koala scratchings indicates that Koalas have used the area and would continue to do so as they are transient.
- The removal of habitat for the threatened Glossy Black Cockatoo and the removal of the fauna winter foraging area of Swamp Forest. Replacement habitat should be established before clearing the existing habitat.
- Crossing bridges should be built prior to construction and needs to have the input of various "experts" to ensure all concerns can be addressed. In addition hollow dwelling species should be given "prior notice" given that many are nocturnal.
- The detailed design for the two bridge crossings should incorporate provision for terrestrial fauna passage.
- Safeguards proposed for the Common Planigale, including exclusion fencing and fauna underpasses may not be suitable for this species.
- Although the Green-thighed Frog is very cryptic; information on when and how many further surveys are going to be conducted needs to be provided.
- It is not clear how constructed sediment basins would be managed so as not to provide habitat for the introduced Mosquito Fish.
- The DEC notes from Section 8.4 that the Proposal would create a 52 to 100m barrier to Squirrel Gliders moving between seasonal foraging habitats, winter and summer resources. As there is very limited information on the success of mitigation measures to enable arboreal animals to cross a "six lane" highway (potentially), the DEC is concerned about the long-term impacts on this species (potential extinction as indicated in EIA). For this reason, the identification and subsequent implementation of suitable mitigation measures is extremely important. Procedures need to be developed to ensure that the various safety, constructability, useability issues are properly addressed.
- The DEC is concerned about the need to ensure that the swamp mahogany vegetation on the western side of the proposed highway does not become deficient in water (this vegetation is also important for other threatened species). The maintenance of the quality and quantity of this vegetation is critical and may also ensure that the proposed fauna crossings success is maximised.
- The DEC states that it is suggested that prior to construction a protocol be implemented to survey and tag Squirrel Glider individuals within the proposed crossing areas.
- The DEC supports the fitting of radio collars to gliders during the operational stage, to determine usage of fauna overpasses. The DEC suggests however that useful

information may be obtained by fitting radio collars prior to construction to determine what impacts construction may have on resident individuals currently within the area.

- The question is raised by the DEC as to what is proposed should it be determined that squirrel gliders are not crossing the highway?
- The DEC is concerned that the plan to step some culverts higher to allow fauna use does not allow for the access of larger species, including wallabies, as there is not adequate height.
- The DEC states that any scour protection measures must be designed to facilitate terrestrial fauna movements, the minimum requirements for which can be obtained in consultation with DEC.
- Evidence showing that Squirrel Glider aerial bridges actually work, nest boxes are successful, or Koala underpasses are frequently used has not been presented. Evidence needs to be presented, including findings in relation to predation levels at the entrances and exits of aerial bridges and underpasses, and within nest boxes. There is no measure of the effectiveness of the design, or number of these structures.
- The existing powerline easement has never stopped the movement of fauna as stated in the SIS.

Submissions:

16, 18, 19, 24, 30, 32, 34

Response:

Barrier effects are discussed in detail in Section 5.5 of Technical Paper 7 – Ecological Assessment and Species Impact Statement. Barriers, both physical and biological, would be created and maintained as part of the proposed Upgrade.

Two regionally significant wildlife corridors in the study area are currently transected by the existing Pacific Highway. The proposed Upgrade would involve widening of the alignment at these locations. Therefore, the existing barrier impacts in these wildlife corridors would be increased. However, barrier impacts were reduced by placing the alignment to the west of the powerline easement, avoiding an extensive tract of contiguous native vegetation to the east. Measures such as underpasses and glider poles are proposed to mitigate barrier effects.

The proposed Upgrade would create a barrier in the area between the mountain access track and the water towers, which is of particular importance for the Squirrel Glider population. The proposed Upgrade would create a significant movement barrier to Squirrel Glider as it would fragment winter and summer foraging habitat.

Mitigation measures are proposed to facilitate the movement of Squirrel Gliders across the proposed road corridor. However, as research into the suitability of mitigation measures for this aspect is ongoing, a final decision with regards to glider mitigation along the proposed Upgrade would be made based on the results of rope/wire bridge monitoring along the Karuah Bypass. Measures may comprise gliding poles, rope/wire bridges or a combination of both methods. The bridge design, configuration and height of poles and the monitoring method used would be decided in consultation with the Department of Environment and Conservation (DEC).

A significant barrier exists where the preferred alignment runs along the existing powerline easement. While it is assumed that small ground-dwelling and sedentary fauna species would not be able to cross this barrier, highly mobile species such as birds and bats would not be affected.

The northern and southern sections of the route would duplicate the existing highway, creating wider barriers and resulting in additional vegetation clearance along the existing highway. This is likely to exacerbate existing barrier impacts for such species as the Koala, small-medium ground-dwelling mammals (for example, bandicoots, wallabies), gliders, birds that forage along roadsides (for example, Glossy Black Cockatoos and owls), reptiles and amphibians. Drainage culverts and fauna underpasses are proposed to mitigate additional barrier impacts on ground dwelling fauna species.

Section 2.6 in Technical Paper 7, describes the Koala survey effort. This survey effort comprised the following: spotlighting over 45 hours 20 minutes; targeted searches over 2 nights in winter (5 hours); scat searches over 15 20x20 m plots (no scats found); and 19 person-hours general searching. This level of detail in the survey effort is considered adequate. Scratchings were noted, but without other corroborating evidence, these are recorded as only possibly indicating the presence of Koalas as other arboreal species also leave scratch marks. As no Koalas were seen and no scats were found, there is only a low probability that they occur in the study area. These studies were undertaken by professional ecologists experienced in such surveys.

It is generally not possible or practical to establish replacement habitat or build fauna mitigation structures prior to road construction, as the road itself determines the placement of these mitigation measures. Furthermore, it is highly likely that noise, vibration and other disturbance associated with heavy machinery and human activity would preclude use of these areas or structures by sensitive species until construction is completed. Clearing for the project would be undertaken using a two stage process whereby all non-hollow bearing trees are removed first. In addition, landscaping would be undertaken progressively during the construction works program, while fauna mitigation structures would be installed as earthworks build up on the Proposal. If it is agreed that “arboreal” crossings have the potential to be effective, development of practical and cost effective crossings would be completed as part of the detailed design stage and prior to construction, in consultation with the DEC and other relevant experts.

Detailed design of the Myall River and Frys Creek bridge crossing would be undertaken to incorporate the provision for a minimum 2 metre wide terrestrial fauna passage. Further consultation with DEC would be undertaken at this time.

There is only a low likelihood that the Common Planigale occurs in the study area and therefore no specific safeguards for the species have been developed.

Additional survey work for the Green-thighed Frog would be undertaken during appropriate weather conditions (after rain) in summer 2006. A single 3-day survey would be undertaken at this time. The results of the survey would be forwarded to the DEC for their information.

Sediment ponds would be designed to contain stoppered outlet pipes to allow water to be drained. This would render the ponds less suitable for Mosquito Fish. Outlets would then be closed to allow sediment ponds to function normally.

Measures to mitigate potential fragmentation impacts on Squirrel Gliders are discussed in Section 6.3.2 and 8.4.5 of Technical Paper 7 – Ecological Assessment and Species Impact Statement. The design and placement of glider poles or rope bridges would be developed during the detailed design stage of the project. In addition, the need for a monitoring program would be determined and if required developed, in consultation with DEC

Culverts in this section of the Proposal have been strategically placed to maintain hydrology regimes. Every attempt has been made to ensure that appropriate mitigation is provided to

minimise any impact to the hydrology of swamp mahogany vegetation (see Section 6.3 in the EIS). It should be noted that any drainage initiatives considered in this vicinity need to comprehend the proximity of sensitive orchid species, and the implications of any management strategies on these individuals. Further updated information in relation to the maintenance of hydrology at this location is provided in Chapter 6 of this Submissions Report.

It is not proposed to survey and tag Squirrel Glider individuals. Radio-tracking of Squirrel Gliders once the road project is in operation is provided for.

Details of radio-tracking of Squirrel Gliders once the road project is in operation would form part of the monitoring plan that would be discussed as part of the EMP. This would be undertaken in consultation with DEC. It is not proposed to undertake radio-tracking of gliders prior to the construction of the Proposal.

The risk of Squirrel Gliders not crossing the highway would be minimised by optimising design and/or placement of glider crossings according to the monitoring results obtained from the Karuah Bypass section of the Pacific Highway. Should it be found that Squirrel Gliders are not crossing the highway, then further consultation with the DEC would be undertaken.

As culverts are approximately 2.5 m high, stepping the culvert inverts for fauna use would not preclude use of these culverts by larger ground-dwelling mammals.

The scour protection measures are discussed in Chapter 6 of Technical Paper 7. The final design of scour protection measures would be undertaken in consultation with DEC during the detailed design stage.

There is evidence in the form of published papers and monitoring studies to show that aerial bridges and nest boxes have been used by arboreal mammals and that underpasses are used by a diversity of small and medium-sized mammals including Koalas (AMBS, 2001 and Land for Wildlife, 1991). The RTA has been monitoring a range of culverts and bridges along various sections of the Pacific Highway since the early 2000's. These reports have been forwarded to DEC (then NPWS). Reported evidence of predation was not great and there is no evidence to suggest that predation of native fauna species at the entrance and exists of underpasses is greater than elsewhere (Little et al 2002, Catling 1994). It is agreed that there may be some risk of predation and/or competition associated with underpass exits, the benefits associated with providing additional movement corridors generally outweighs the risks. There has been monitoring of one of the glider crossings at Karuah and possums and squirrel gliders have used the structure. The radio tracking in operation of the Bulahdelah crossings will assist in developing knowledge in this area. Monitoring would be undertaken in order to gauge the success of fauna management measures as identified in the Technical Paper 7 of the EIS.

Research has shown that small clearings, roads and powerline easements can act as significant physical and/or behavioural barriers for small mammals, forest-dwelling birds, frogs and reptiles. Although no studies have been undertaken along this particular powerline easement, it should be assumed that it has the potential to create a movement barrier for small, sedentary fauna species.

4.8.3 Flora

In summary, the respondents to the EIS and SIS raised the following issues:

Note:

Submissions: 5, 9, 13, 15, 16, 18, 19, 20, 24, 25, 29, 30, 31, 32, 34, 35, 37, 38, 40, 41, 44, 45 are addressed in sections 4.8.3.1 and 4.8.3.2.

4.8.3.1 Orchid Issues

- The DEC states that it is unclear what additional survey measures are proposed for the various orchid species, given the survey constraints caused by wild fires.
- The DEC states that it is unclear what the predicted period of recovery for the Orchid species might be post wild fire.
- The DEC asks when and where the cryostorage of the threatened orchid seeds is going to happen.
- *Cryptostylis hunteriana* is the rarest species in the *Cryptostylis* genus, and the population at Bulahdelah is the largest known. The DEC and other respondents state that comments in relation to *Rhizanthella slateri* apply equally to *Cryptostylis hunteriana*.
- The DEC and other respondents state that the direct and indirect impacts of the construction on the *Rhizanthella slateri* population (38%) may in fact be greater than the percentage indicated, owing to the difficulty in predicting the full range of impacts on the species. Given the likelihood of substantial fragmentation and edge effects on *Rhizanthella slateri*, perhaps only 50% of the population may survive in the long term.
- The absence of population numbers for *Rhizanthella slateri* and *Cryptostylis hunteriana* has no relevance to their sensitivity to disturbance, and made an evaluation of the SIS impossible. Can information on population numbers be released after translocation?
- *Rhizanthella slateri* has yet to be assessed under Commonwealth legislation. A “Threatened Population” nomination for the Bulahdelah site has been submitted to the NSW Scientific Committee, as the population at Bulahdelah is the largest known for the species, and is also the northern population limit. There are indications that the population at Bulahdelah is genetically different from other known populations of the species, and therefore may be sufficiently different to be recognised as a species in its own right – this would mean that the site would be the only known location of the species, and therefore assume national and global significance.
- The ecological assessment has failed to address the long term impacts associated with the Proposal bisecting known habitat of the Eastern Underground Orchid and Leafless Tongue Orchid and the resultant edge effects of this fragmentation on the remaining population, including the threats of increased pollution, hydrological modification, and modification of important leaf litter layers to the habitat of both populations above and below the proposed alignment.
- The DEC states in regard to different construction techniques in the area of colluvium, that the location of sensitive flora species must be understood to ensure minimal impact on these species.
- Forests NSW must be notified and consulted about where the intended action is to relocate populations of threatened flora from the area of the bypass to other areas of State Forests’ estate.
- The successful translocation of mycoheterotrophic orchids has never been reported. All relevant literature and expert opinion indicates that the translocation, cultivation or growing by seed of the Leafless Tongue Orchid and the Eastern Underground

Orchid would not be successful, if not impossible. These plants are completely reliant on their (usually highly specific) mycorrhizal partners, which are, in turn, usually reliant on other symbiotic partners, such as ectomycorrhizal trees. Severance of these relationships seems to result invariably in orchid death. In one case (*Rhizanthella gardneri*), where these symbiotic relationships were well understood, it was possible to cultivate a mycoheterotrophic orchid from seed and establish it in a pot containing a plant of the ectomycorrhizal host of the orchid's mycorrhizal fungus. Such success is highly unusual and has relied on an excellent understanding of the biology of that symbiotic system. Given that the identity of the mycorrhizal partner of *Rhizanthella slateri* is unknown, including details of its other biological interactions, the success of translocation for this species is limited (based on current knowledge). The experimental plan for translocation would only be acceptable if it demonstrated through rigorous prior investigation that saprophytic orchids can be successfully translocated. Until such evidence exists, the RTA should not proceed with Option E.

- The loss of large areas of proximate habitat for those species likely to disperse and pollinate *Rhizanthella slateri* and the Leafless Tongue Orchid has not been considered within the study, particularly considering the Bandicoot and other fossorial species occurring in the study area are not threatened, and therefore were not studied in detail. The DEC is concerned about the ability of pollinators to cross the highway, and suggests that options should be investigated further.
- Contrary to what is stated in the EIS, *Rhizanthella slateri* flowering heads have been found within 10-20m from all the proposed alignments.
- The lack of knowledge of ecological function of the Eastern Underground Orchid and Leafless Tongue Orchid species corresponds to a lack of knowledge on the likelihood of impact, and therefore a precautionary approach should be adopted, preventing rather than minimising impacts, by avoiding ecological, hydrological, reproductive and toxic contamination threats.
- Large infestations of ecologically destructive environmental weeds would be created which would have the potential to substantially modify the status and composition of the detrital layers, to the detriment of the mycorrhizal assemblages. These environmental weeds would also have the potential to change the frequency and intensity of fire events, to the potential detriment of the populations of Eastern Underground Orchid and Leafless Tongue Orchid present.
- The Proposal would have substantial adverse impacts on the vegetation communities of Bulahdelah (Alum) Mountain, including the three identified threatened orchid species. This environment is unparalleled in the quantity of native orchid species varieties. A possible new hybrid of Greenhood is also being monitored for documentation. The clearing of trees should be kept to an absolute minimum.
- *Corybas dowlingii* is the only threatened species of orchid that could be successfully translocated. However the probable destruction of 25% of the population would not enhance the scientific knowledge of its recent discovery, but lead to fragmentation together with the potential for population decline. This species has not been classified under either State or Commonwealth legislation, only recently having been described as a new species. With the reclassification it takes on National significance. It may well be unique to this site, and until it can be assessed for distribution, there should be no impact upon its distribution on the site.
- No sound, effective, or feasible mitigation measures have been proposed for impacts on underground orchids. The RTA statement that Option E has been diverted to avoid protected flora is incorrect. Is it possible to provide something similar to a raised area for the survival of the orchids?
- *Cryptostylis hunteriana* is listed in Schedule A of the Commonwealth EPBC Act 1999, and the colony on Bulahdelah (Alum) Mountain is the largest recorded. According to

Table S4, at least 45% of the colony would suffer direct impact and another 10% an indirect impact. This estimate of loss is unacceptable considering the national significance of the species. The worst case scenario of 56% effect on the *Cryptostylis hunteriana* may affect the long term viability of this population and makes the RTA actions, a threatening process. Fragmentation would also occur as well as likely population decline due to edge effects such as airborne and waterborne contamination. This species has a conservation target of 100% in north east NSW.

- The permanent impacts associated with airborne release of hydrocarbons (Polycyclic Aromatic Hydrocarbons (PAH's) and Diesel Particulates) and traffic fumes into known habitat of threatened underground orchids have not been assessed.
- *Rhizanthella slateri* does not require photosynthesis for survival; this quality should be the subject of further scientific investigation. In addition, some of the plants on Bulahdelah (Alum) Mountain may hold the key to a cure for any number of diseases. Further research is in line with NSW Scientific Committee recommendations.
- The DEC states that the EIA notes the population of *Rhizanthella slateri* through which the proposed Bulahdelah Bypass would pass as the largest population known. This population is at least ten times larger than any other known population of this species. At some localities of *Rhizanthella slateri*, each "population" (or solitary, spreading plant) is less than 0.5m wide. Presently the individuals at Bulahdelah are the only multiple plants that have been found over a relatively wide area. The DEC acknowledges that the identification of the largest "known" population may be due to (a more) intense sampling effort than at most other localities. However, until other large populations are discovered, their existence cannot be assumed.
- The DEC states that any translocation of threatened plant species must follow the Australian Network for Plant Conservation (ANPC) Translocation Guidelines (2004) or the most current guidelines. It should be noted that translocation is not a "quick fix" measure and often requires extensive input and cost, particularly for a species where the success or otherwise of translocation is unknown. The DEC considers that the translocation of some orchid species is likely to be unsuccessful. The establishment of these translocation trials early is essential. While it is noted by the DEC that there are often delays between project approval and construction, it is essential to develop the translocation strategy sooner rather than later. It is extremely important to ensure that "relevant" experts are involved in this process. The DEC suggests that a "trial" translocation plan is a high priority and the development of this document prior to approval is warranted. Care would need to be taken during the translocation of the Eastern Underground Orchid, as it is noted that this is likely to be undertaken after flowering during dormancy, accurate locations for this species should be identified during flowering. It is unclear how long these translocation trials are proposed to be undertaken for. It is suggested that the time period for this should be developed in consultation with relevant experts. If the trials are only undertaken over a short period of time then results may be limited in value and not truly reflect the situation (i.e. dormancy periods etc.). The DEC suggest that any final translocation plan is developed prior to a construction contract being awarded and this can then be used to direct any contractor. Past experience has suggested that the best results are achieved when the responsibility for translocation is not left to the road construction contractor, but is undertaken by the RTA under separate contract. In addition, consideration must be given to any erosion and sediment control requirements (e.g. scour protection) for the translocation of the orchids.
- The DEC refers to Section K1.4 - stating that it is possible for other individual orchids to occur however they may only become exposed after clearing or excavation works. Careful procedures would need to be implemented to ensure that any individuals likely to be present are identified, particularly due to the size of the construction vehicles.

- The DEC comments on the level of conservation significance of *Rhizanthella slateri*, stating that as indicated within the EIA, *Rhizanthella slateri* is listed (from 6 December 2002) under New South Wales legislation as a vulnerable species but it is not listed under Commonwealth legislation. The EIS interprets this as indicating that the conservation of this species is only of state significance and not of national or international significance. While this species has not been listed under Commonwealth legislation, the high significance of this species should not be overlooked. As only a handful of plant species are known to be completely subterranean (including *Rhizanthella gardneri*, an unnamed *Rhizanthella* spp. known from south eastern Queensland, and *Rhizanthella slateri*) the conservation of these species is extremely important given that they are capable of completing their life cycles entirely underground. While a small number of mycoheterotrophic plants remain subterranean for most of their lives, almost all of these emerge to flower and fruit. Subterranean flowering plants are therefore extremely unusual, specifically given their extraordinary physiological and reproductive adaptations and evolutionary history. For this reason the species is of great scientific interest, particularly as the selective pressures responsible for the evolution of this underground lifestyle is not understood.
- Numbers of *Rhizanthella slateri* could be as low as 10 and up to 100 individuals. The impacts upon this threatened species cannot be justified and are unacceptable.
- The population of Eastern Underground Orchid at Bulahdelah is at the northern limit of its distribution, and the population in the Lamington National Park is considered to be a distinct species. It is apparent that the Bulahdelah population of the Eastern Underground Orchid may be sufficiently distinctive to be recognised as a unique species. The species is nationally and globally significant. This information is not presented in the Ecological Assessment Technical Paper.
- Several omissions were noted within the SIS. In addition no reference was made to the Forests NSW environmental database of flora and fauna records.
- If Option E is to prevail, a long term protection plan for the orchid species needs to be prepared, including ongoing monitoring and evaluation of the populations.
- The DEC notes that the genetic testing is being undertaken to determine the relationship between the individuals of *Cryptostylis hunterina*, however the results are not yet known. Is there any indication when information might be available from these genetic testing? Is this genetic testing using individuals collected from the study area and/or other plants across a greater distribution?
- The DEC notes that the known orchid plants within the study area are located at no greater distance than 75-130m apart. Given that some individual plants may not have been detected, this distance may in-fact be a lot less. As indicated within the report, it would appear to be critical to ensure that these distances aren't exceeded and that suitable provision for the Ichneumon Wasp is maintained to enable cross-pollination to occur. This issue needs to be investigated further.
- The DEC refers to Section K1.5 - regarding ameliorative measures for the orchid species, it appears evident that maintaining surface and subsurface drainage and flow patterns downhill (western side) of the alignment is highly critical to the survival of not only the orchid populations but also the vegetation which supports threatened fauna (e.g. Squirrel gliders). The implementation of the correct/adequate mitigation measures is highly important to ensure the survival of the very sensitive species on the western slope of Bulahdelah (Alum) Mountain. This outstanding issue needs to be resolved to the satisfaction of the DEC or any other approval organisations.
- The DEC states that the information collected as part of the survey for the orchid works should be detailed and included within an update to Appendix K. The RTA needs to ensure that this information has been adequately collected as described within the survey requirements.

Response:

Annual surveys to assess the condition of known populations of orchids are proposed to be undertaken during the flowering period before commencement of construction. This would enable an assessment of the impact of the wild fires on the populations in the long-term. Additional follow-up surveys are currently being undertaken by State Forests, although no *Rhizanthella spp.* appear to be flowering following the wildfire in 2004. Full details of the proposed monitoring of orchids retained in-situ would be provided in the Orchid Management Plan currently in preparation, including specific provision for post fire monitoring.

Requirements for survey of orchids during and after construction will be outlined in the Orchid Management Plan currently being developed in consultation with DEC and DEH.

It is unclear what the predicted period of recovery for the Orchid species might be because the orchid's response to fire is at this stage is unknown. At present, there is no evidence of burnt populations of *Rhizanthella spp.* one year after a wildfire. It should be noted that it took 2 years for *Cryptostylis spp.* plants to re-appear post burning.

At present the process and location of cryostorage has not been determined. Detailed investigation of this issue and its suitability is being undertaken as part of the preparation of the Orchid Management Plan.

The *Rhizanthella slateri* and *Cryptostylis hunteriana* orchid species have been treated in a similar manner in the EIS and SIS. In addition, the Orchid Management Plan (in preparation) would cover in detail management requirements for both species.

The assessment in the SIS concluded that up to 38% of the population of *Rhizanthella slateri* would potentially be affected by the Proposal. This figure was derived from a conservative consideration of the extent of edge effects resulting from the construction and operation of the Proposal (see Section 3 of Appendix A, Technical Paper 4 – The Proposal and Chapter 6 of the EIS). When examining *Rhizanthella slateri* the next nearest population is located 70 metres uphill of the footprint, with most being between 100–170 metres uphill of the alignment. Even if an edge effect extending 50 metres into a habitat was adopted as suggested by Bali (2000), it is considered highly unlikely that any additional *Rhizanthella slateri* plants would be affected by the construction or operation of the Proposal. Indeed the percentage of the population of *Rhizanthella slateri* affected by the Proposal may in fact be less than the conservative figure presumed in Appendix K of Technical Paper 7.

Population numbers have not been released based upon advice from DEC and are unlikely to be able to be released post translocation.

Genetic data that has been assessed from the Bulahdelah site shows that the populations of *Rhizanthella slateri* at Bulahdelah are not significantly different from other populations in NSW and it is not considered to be a separate species. The site has been acknowledged in the SIS (see Section 3.5 of Technical Paper 7) as being of national significance due to a number of reasons, including being the largest population of *Rhizanthella slateri* known in Australia.

The assessment of the orchid species in the SIS did consider the fragmentation of the population and the resultant edge effect. However, given the lack of knowledge about these species, details of the impact of the proposed Upgrade cannot be fully ascertained (either positively or negatively). A number of scenarios and impacts on the populations were assessed as part of the SIS. It should also be noted that some *Rhizanthella slateri* plants

occur right on the edge of the powerline easement, so appear to be tolerant of some edge effects.

All sensitive flora species in the colluvium area have been surveyed and their locations are known. Any areas containing these species near the alignment would be appropriately fenced to minimise the construction impacts. The location of these species would be taken into consideration during the detailed design stage of the project.

Forests NSW would be involved in identifying the most appropriate site for translocation to occur. A preliminary meeting was held with staff from Forests NSW on 14 September 2005 to discuss threatened species, translocation and other impacts on the Forests NSW estate. There will be more detailed discussions with Forests NSW during the preparation and implementation of the Orchid Management Plan.

The SIS acknowledges the expert opinions and difficulty of translocation of the orchid species (see Sections 5.1 and 6.1.4 of Technical Paper 7). Translocation is not proposed as a mitigation measure for the Proposal, but it is suggested that it be attempted. There is always the possibility that a technique may be found that is successful and the attempt would also provide a greater understanding of these and other similar species. In this context wide input has been sought from a variety of expert sources as to the content and form of the Orchid Management Plan that would govern the issues associated with the orchid species and their translocation.

It is acknowledged that an impact of the proposed highway upgrade is fragmentation of the orchid populations. As little is known about the pollination and seed dispersal mechanisms of these orchids, it is also possible that the proposed highway upgrade may form a barrier for pollinators and seed dispersers.

The provision of suitable crossing points of the proposed road for bandicoots (a possible seed disperser of the Underground Orchid) is discussed in Section 6.3.1 of Technical paper 7 – Ecological Assessment and Species Impact Statement. Bandicoots are a mobile species. It is considered likely that bandicoots would use Stuart Street underpass and may use drainage culverts in the area and the Mountain Access Track overbridge.,

The Ichneumon Wasp/Orchid Dupe (the pollinator of the Leafless Tongue Orchid) is likely to cross under the Stuart Street bridge, thereby reducing fragmentation and barrier impacts. It is acknowledged that the Stuart Street underpass's location at the far northern end of the orchid populations is not ideal in aiding pollination.

Options for additional mitigation measures to aid movement of pollinators and dispersers have been considered. In particular, bridging adjacent to orchids was considered. However, it was considered that the high cost and the unlikely or unknown effectiveness of this measure did not adequately justify this mitigation measure. An Orchid Management Plan is being developed in consultation with the DEC and DEH to formulate other means of reducing impacts on orchids.

The information in the EIS and SIS is based on detailed field survey of all of the identified orchid flower heads in relation to the proposed road alignment.

A precautionary approach has been undertaken when assessing these species and the likely impact of the road upon them (see Chapter 5 and Appendix K of Technical Paper 7). It was not possible to align the bypass so that no impact on the orchids occurred given the many and varied constraints in the area (see Chapter 4 of the EIS), however impacts were minimised as much as feasibly possible.

The area in which the orchids occur is currently subjected to high levels of disturbance through a transmission line, existing tracks and the proximity of walking trails and a picnic area. Given the existing level of disturbance in the area and the environmental management controls that will be incorporated into the Proposal, it is unlikely to result in such high levels of ecologically destructive environmental weeds that the area would become unsuitable for the orchids to survive.

The design of the proposed bypass in the area of Bulahdelah (Alum) Mountain has been minimised as much as possible and the footprint narrowed in a number of places to avoid significant areas (see Chapter 4 of the EIS). Consideration has been given to all flora species, and particular attention given to species of significance. The preparation of the SIS, and subsequent development of an Orchid Management Plan has involved consultation with DEC and DEH. The presence or status of a new hybrid of Greenhood is unknown.

Only a small number of *Corybas dowlingii* would be affected, with the majority of the population located uphill of the proposed alignment. The population in the area is considered highly unlikely to decline due to the proposed Bypass (see Appendix K of Technical Paper 7).

Option E was re-aligned to avoid as many impacts on the orchid as possible, given other constraints in the area. Providing a raised area to protect the orchids is just as experimental as other measures and would be far more costly.

The potential loss of up to 56% of the population of *Cryptostylis hunteriana*, fragmentation and other potential edge effects have been acknowledged in Chapter 5 and Appendix K of Technical Paper 7. In consultation with orchid experts and DEC, the most appropriate mitigation measures have been recommended. A detailed orchid management plan is currently being prepared for the project to further examine mitigation and monitoring of the population.

The RTA has a best practice policy including appropriate drainage and sediment basins associated with minimising the release of chemicals and heavy metals into adjacent habitats. Most Polycyclic Aromatic Hydrocarbons (PAH's) accumulate in road sludge and would be captured in sediment basins. The runoff from the road surface in the orchid area is being directed to a nearby sediment basin, and will therefore not have a direct impact on the surrounding orchid population groups. Minimal study of the effect of traffic fumes on the Australian environment has been undertaken, although overseas work has found nutrient enrichment and chemical contamination occurs up to 50 metres beyond the edge of the road, depending on the volume of traffic (Forman et al 2003). How traffic fumes from the Bypass would affect the habitat and viability of the orchids is not known. A detailed Orchid Management Plan is currently being prepared for the project to further examine mitigation measures and management of in situ orchid populations.

It is known that *Rhizanthella slateri* does not photosynthesise, but acquires its energy from a symbiotic relationship between the orchid and a mycorrhizal fungus. The examination of this relationship would form part of the Orchid Management Plan currently being prepared. The proposed bypass is unlikely to cause the extinction of any plant species population on Bulahdelah (Alum) Mountain, so would not preclude finding cures for diseases using these species in the future.

The survey effort of 71.5 person days, the nature of the *Rhizanthella slateri* population at Bulahdelah, including the fact that the Bulahdelah population is at least ten times larger than

any other known population of the species is acknowledged and has been discussed in Section 3.5 and Appendix K of Technical Paper 7.

An Orchid Management Plan covering translocation is currently in the process of being written so that trials can begin as soon as possible following approval. The Orchid Management Plan is being written in consultation with DEC and DEH to ensure all requirements are met, including a consideration of the Australian Network for Plant Conservation Translocation Guidelines. Issues such as determining the location of suitable translocation test sites, land ownership and the security of the sites will also affect the timing of any translocation trials.

Once approval has been obtained, detailed procedures would be incorporated into the EMP to locate all individual threatened orchids within the road footprint prior to the commencement of clearing operations. The Orchid Management Plan will describe procedures for managing individual orchids located during clearing and excavation works.

Rhizanthella slateri is only listed on State legislation and consequently was assessed as being of state conservation value. However, within the SIS it was afforded the same level of assessment and investigation of mitigation as *Cryptostylis hunteriana* (a nationally threatened orchid). Therefore, this species was treated as equally significant within Section 3.5 of the SIS.

The number of *Rhizanthella slateri* individuals was not released to the public as directed by DEC for security reasons. An Orchid Management Plan is currently in preparation to examine the impact all possible mitigation measures and monitoring that would be undertaken for the orchid population. As described in Chapter 5 and Appendix K of Technical Paper 7, the Proposal would impact upon 38% of the known population in the worst case scenario.

It is acknowledged that since the preparation of the SIS, the population of *Rhizanthella* in Lamington National Park has been determined to be a separate species. The population of *Rhizanthella slateri* at Bulahdelah is not genetically distinct from other known populations in NSW. The State significance of the population at Bulahdelah remains unchanged. The conservation value of the population at Bulahdelah is discussed in Section 3.5 of the SIS. The assessment of significance undertaken in the 8-Part Test assumed that the population of *Rhizanthella slateri* extended north to the Lamington National Park. Since the preparation of the 8-Part Test the population in Queensland has been determined to be a separate species. Despite this new information the outcomes of the 8-Part Test remains unchanged, in that the Proposal would have a significant impact on the species.

The omissions relevant to the Eastern Underground Orchid and the Leafless Tongue Orchid that appeared to be evident in the SIS were contained within the confidential Appendix K of Technical Paper 7. It is acknowledged that no recent records were obtained from Forests NSW during preparation of the SIS.

Monitoring and evaluation of the orchids has been proposed and forms part of the Orchid Management Plan currently being prepared. This plan would require approval from both DEC and DEH.

Technical Paper 7 was incorrect in that no genetic testing has been undertaken on *Cryptostylis hunteriana*. Genetic testing was only conducted on *Rhizanthella slateri*.

Further investigation of the design of the Proposal to ensure cross-pollination can occur has been undertaken in consultation with DEC. In addition further studies relevant to this issue are described in Chapter 6 of this Report.

Consultation with DEC is currently being undertaken to resolve the issue of ameliorative measures for the orchid species and other vegetation supporting threatened fauna species in relation to maintaining surface and subsurface drainage patterns.

Further survey work of the orchids would be undertaken pursuant to that outlined within the Orchid Management Plan currently in preparation. Monitoring of existing populations is currently being undertaken by staff from Forests NSW for the RTA and information obtained from this survey would be forwarded to the DEC and incorporated into the Orchid Management Plan.

There have been subsequent discussions between RTA and DEC Officers in regards to the orchid issue during July 2006 and August 2006. There were also further discussions with a range of Agencies during September 2006, culminating in a meeting of RTA, DEC, State Forests and DEH in relation to the orchids in Sydney on 20 September 2006.

A practical approach to the resolution of the orchid issues was discussed during the meetings. These included an RTA commitment to:

1. Undertake additional orchid field survey. The objective of this survey is to:
 - confirm the extent of the existing orchid populations;
 - locate additional potential orchid habitat adjacent to the project corridor; and
 - locate any new orchid populations in or near the project corridor.
2. Further investigate a reasonable option for the protection of important identified orchid populations in close proximity to Bulahdelah Upgrade. This would take into account:
 - if additional habitat areas are found;
 - the measures outlined in this report and the EIS;
 - reasonableness and cost;
 - land owner issues;
 - land purchase versus Voluntary Conservation Agreement (VCA); and
 - other relevant factors.

During the meetings the RTA also reaffirmed its commitment to:

1. Undertake research over the next 2 to 3 years that focuses on pollination, seed collection and propagation. The information and seed collected during this period would be used in propagation trials to be developed as part of the Orchid Management Plan in consultation with State Forests, DEC and DEH. Seed would also be held in long term storage for future research and propagation.
2. Incorporate longer term orchid propagation and translocation activities for the orchid species following the initial 2 to 3 years of research, if the initial propagation trials prove to be successful. The program for the research and trials would be incorporated into the Orchid Management Plan in consultation with State Forests, DEC and DEH.

The RTA, DEC, DEH and State Forests have agreed to the establishment of an inter-agency advisory group to provide ongoing Agency input to the research and translocation activities for the threatened orchid species. It will include representatives from the RTA, DEC, State

Forests and DEH. The role and terms of reference of this group will be finalised during the development of the Orchid Management Plan.

A potential timeline for the proposed Orchid management activities is outlined in Table 4.2. This timeline is subject to the approval of the project, decision on the timing of construction activities and further discussions with DEC, State Forests and DEH during the development of the Orchid Management Plan.

Table 4.2: Potential timeline for proposed Orchid management activities

TASK	2006	2007	2008	2009	2010 Onwards
A. Initial Research					
Micro-habitat analysis of existing sites.					
DNA Research					
Root Morphology Investigation					
Hand-pollination and Seed Collection					
Seed and Fungus storage					
Fungus Species Identification					
Fungus Host Tree/Shrub Identification					
Propagation trial					
B. Propagation and Translocation trials					Ongoing
<i>Ex-situ</i> Propagation					Ongoing
Identification of possible Translocation Sites.					
Fungal Baiting of possible sites.					
Translocation trial					Ongoing

The timing and duration of specific actions will be further discussed with DEC and DEH in the near future as part of an application for a scientific licence to carry out the proposed research activities. The extent and nature of the propagation and translocation trials will be subject to the outcomes of the initial propagation trial in the research phase. The proposed program and activities will also be discussed during the development of the Orchid Management Plan.

It is envisaged that these commitments will generally form part of the implementation and construction phase of the project. While some consultation and research activities will commence prior to the approval of the project, the majority of the activities contained in the Orchid Management Plan will be undertaken post project approval.

4.8.3.2 Other Flora Issues

In summary, the respondents to the EIS and SIS raised the following issues:

- The DEC notes that a discussion is provided in Section 3.3.1 of the preliminary listed Endangered Ecological Communities (under the TSC Act). The DEC asks that the RTA be aware that these preliminary listings have now been made final (as at 17 December

2004), hence a full assessment of the potential impacts on these communities is required.

- The DEC states that Section 8.1.4 of Technical Paper 7 indicates that no individuals of *Angophora inopina* would be affected by the Proposal. However Section 8.1.7 states there would be the removal of a small number of individuals. This needs clarification.
- The DEC states that the fencing/para-webbing proposed within 3m of the edge of the canopy drip zone of the *Angophora inopina* individuals must be implemented into detailed designs.
- The DEC requests that the collection and propagation of seed from *A. inopina* species needs to be undertaken early in the project development stage particularly given past experience with propagation has had a limited success rate.
- Clarification is requested by the DEC with regard to how the timeframe of comprehensive native seed collection (approximately 12 months) would be consistent with the construction timeframes.

Response:

A full assessment of the proposed bypass on Freshwater Wetlands EEC has been undertaken. The remaining two EEC's in the area would not be affected by the Proposal and therefore, no further assessment is considered to be required. The report is summarised in Chapter 6 of this Submissions Report, and a full copy of the report is included in Appendix B.

As discussed in Section 8.1 of Technical Paper 7, no known individuals of *Angophora inopina* would be removed. A small number of seedlings that may be *A. inopina*, may be removed east of the existing Pacific Highway and the intersection with Booral Road. It is likely that these seedlings are hybrids, however it is not possible to determine if the seedlings are hybrids or pure specimens until they produce fruit. Therefore, more clarification on this issue cannot be provided.

Detailed design would provide information on the location of fencing/para-webbing around trees and sensitive areas. This would include fencing/para-webbing 3m beyond the edge of the canopy drip zone of plants to be protected as discussed in Section 8.1 of Technical Paper 7.

Seed would be collected from *A. inopina* in the first fruiting season following approval. This would be incorporated into the EMP for the project.

Seed collection would probably be undertaken concurrently with the orchid translocation trials. Given a normal 18 month to 2 year time frame for pre-construction activities, these activities would be undertaken over two or more orchid flowering periods (depending on the date for the start of construction) or an approximate period of at least 12 months. Seed would be collected during this time frame. The timing and approach to seed collection would be detailed in the Orchid Management Plan, but would likely occur at the first appropriate opportunity post approval. It should be noted that collection of orchid seeds, and translocations would be managed separately to other native plants, under the provisions of the Orchid Management Plan.

4.8.4 General

In summary, the respondents to the EIS and SIS raised the following issues:

- Option E would damage the unique natural environment of Mountain Park, and Bulahdelah (Alum) Mountain by affecting rare and threatened flora and fauna species. This does not satisfy the aims of the upgrade in relation to environmental quality.
- Compensatory habitat is of no value if it cannot support species of orchids which are to be directly affected. Consideration should be given to the acquisition of private land within the village zone that has been identified as *Cryptostylis hunteriana* habitat.
- In the narrow strip of presently intact habitat between the highway and the town, there would be a high potential for invasion by feral and domestic animals, leaving surviving wildlife open to attack.
- Proposed design features and mitigation measures need to ensure that they can be implemented and ultimately constructed, taking into account factors including safety, cost, and ability to construct.
- The DEC requests that site data on species recorded during the surveys be forwarded for inclusion into the Wildlife Atlas.
- The regional effect of the RTA clearing piece by piece, and claiming amelioration and compensatory habitat for local populations, amounts to greater clearance than any other developer or farmer in coastal NSW.
- The DEC states that the strategic compensatory habitat package developed does not negate the responsibility of the RTA to ensure that the Proposal avoids and minimises impacts on the environment.
- The DEC notes that the approximate general extent of the proposed construction is indicative, however there would need to be scope to ensure that in sensitive areas, the extent of construction may need to be limited.
- Comments in regard to enhancing the environment are misleading, as much of the southern approach is already modified from a natural environment.

Submissions:

1, 5, 9, 14, 15, 16, 21, 25, 30, 32, 34

Response:

A discussion on the objective to improve environmental quality outcomes, and the achievement of this objective can be found at Section 8.2.2 of the Main Volume of the EIS. Environmental quality deals with issues such as noise, air quality, water quality, biodiversity, visual and amenity impacts. There would be an overall improvement in air quality, noise and long-term water quality. There would be a change in the visual environment, but this would be mitigated and improve with time as landscaping matures and develops. Generally there would be an improvement to the overall environmental amenity within Bulahdelah.

Compensatory habitat is selected for a variety of reasons and is agreed upon by the RTA and the DEC. Compensatory habitat for this project has already been agreed upon (see Section 9.3 of Technical Paper 7). In addition, known habitat of *Cryptostylis hunteriana* within the study zone is within public ownership and afforded a level of protection adequate for the long term viability of the habitat.

The vegetation and habitat in this area is already highly fragmented, with numerous tracks and the existing powerline easement. It is considered that the bypass would not have any

bearing on the numbers of domestic or feral animals in the area, or increase predation on native wildlife (see Section 8.4.6 of Technical Paper 7).

All design features that have been proposed are able to be constructed and/or implemented. Consultation with the DEC is currently being undertaken to further refine safeguards and mitigation measures for threatened orchid species.

The site data for species recorded is currently being forwarded to DEC for inclusion into the Wildlife Atlas.

Chapter 6 of the EIS deals with the Regional impacts of the Proposal. The upgrade proposed would have a moderate level of impact in relation to land clearing, when compared to many other land use practices or developments. In recognising the residual impacts of the Proposal, the RTA has compiled an extensive set of mitigations and also provided an extensive compensatory habitat package. In addition, the environmental policies and practices are well developed to avoid impacts, and where avoidance is not possible minimise and mitigate against impacts.

The RTA understands that the compensatory habitat package developed does not negate the responsibility to ensure the Proposal avoids and minimises impacts on the environment. Accordingly, the project development attempted to avoid and minimise impacts on the environment as much as possible, as described in Chapter 4 of the EIS and Chapter 4 of Technical Paper 7.

It is proposed that in sensitive areas fencing or para-webbing of these 'no-go' areas be undertaken at the commencement of construction and no encroachment into these areas should occur, as described in Section 6.1 of Technical Paper 7. Staff induction would further re-enforce the sensitive nature of these areas and the need to restrict construction in these areas.

The comments in the EIS are not misleading, as the environment would be enhanced from its currently modified state in the south to a more natural environment.

4.8.5 Habitat

In summary, respondents to the EIS and SIS raised the following issues:

- The DEC states that the Glossy-black Cockatoos can have very specific feeding requirements. For this reason, it is important to ensure that the proposed rehabilitation works are undertaken correctly. It is also important to ensure that any seed collected for propagation includes the collection of "known" feed tree seeds, thus increasing the chances that "ideal/suitable" tree species are propagated. The collection of seeds of *Allocasuarina spp.* should be undertaken from the actual stand of trees within the southern area, including those trees proposed to be removed. As with any mitigation measure proposed on land not owned or proposed to be owned by the RTA, the consent of the landowner is critical and the long-term protection of these measures is uncertain. The DEC advocates the implementation of mitigation measures that can be guaranteed or secured in the longer term.
- The DEC suggests that the location of identified hollow trees be used in the development of the detailed design, with a view to reducing the number of actual trees lost.
- It is unclear from the documents if there is a suggested hollow log replacement with nest box ratio. The design of these artificial nest boxes needs to focus on targeting a

certain species (for example bats or birds, or others) and also to ensure that use by Mynas, Starlings and feral bees is not encouraged.

- The nest boxes to be placed within State Forests Estate must be spatially dispersed within the forest to reduce competition between sites, and detailed information regarding the location, style and size of the nest box or hollow must be supplied to Forests NSW both electronically and in hard copy formats (this practice is also recommended for other areas). Monitoring of nest boxes needs to include consideration for invasion by European honeybees which are likely to invade up to one third of sites provided. This monitoring needs to be incorporated into the flora and fauna management plan, throughout the course of the monitoring period proposed.
- The potential impacts of hydrocarbon contaminated runoff into sensitive areas west of the proposed highway in the vicinity of Bulahdelah (Alum) Mountain have not been adequately assessed.
- The DEC is concerned about the potential changes to hydrology as a result of the proposed construction activities, which may have a significant impact on orchid and squirrel glider habitat. Procedures must be developed to ensure that any proposed or envisaged changes to hydrology would not result in additional impacts to the lower slopes of the mountain. If drainage culverts are the only mitigation measures used, then the swamp mahogany vegetation on the western side of the proposed alignment may be lost through desiccation. Considering soil moisture (within the lower slopes of the mountain) is dependent upon direct rainfall and runoff from Bulahdelah (Alum) Mountain rather than from ground water reserves, the issue of maintaining water flow is particularly critical to the survival of important vegetation and significant flora and fauna species. In this regard it is unclear how the maintenance of existing flow paths and regimes and the dissipation of concentrated surface flows out of drainage culverts in the orchid and swamp mahogany areas can be achieved. In addition the designing of any structures proposed to reduce flooding within sections of the township needs to consider the maintenance of sufficient flows to sensitive vegetation communities on the downslope of Bulahdelah (Alum) Mountain. The DEC is particularly interested in the exploration of these issues (including short bridged sections) and any other measures proposed during the Submissions Report.

Submissions:

25, 30, 44

Response:

Allocasuarina seed is proposed to be collected from stands providing known feed trees and those being highly utilised by the Glossy Black Cockatoos in the area. The reseedling/replanting of these feed trees is proposed to be undertaken on RTA owned land that would be used as temporary construction sites and therefore, long-term security would be provided (see Section 8.5 of Technical Paper 7). It is the experience of the RTA that the reseedling/replanting of Allocasuarina has been highly successful.

Detailed design would incorporate consideration of hollow-bearing trees, with an aim to reduce the actual number of trees lost, where possible.

It is proposed that a 1:1 replacement ratio of tree hollows to nest boxes be undertaken. Detailed information regarding nest box placement would be provided as part of the EMP and would incorporate the requirements of DEC. The process was described in Chapter 6 of Technical Paper 7.

Detailed information regarding nest box placement and subsequent monitoring would be provided as part of the EMP. The requirements of Forests NSW, including the location, style and size of the nest boxes or hollows would be incorporated into the plan.

The RTA has a best practice policy including appropriate drainage and sediment basins associated with minimising the release of chemicals and hydrocarbons into adjacent habitats (see Section 6.3.2 of the EIS).

Changes to hydrology, impacts and mitigation measures are discussed in sections 5.6 and 6.5 of Technical Paper 7 – Ecological Assessment and Species Impact Statement. Subsequent assessment of local hydrology, concept design and proposed mitigation measures has been undertaken which indicates that the hydrology downstream of the proposed Upgrade would not be substantially altered from the existing. Measures proposed to maintain water quality and surface and sub-surface flows include:

- Locating channels as closely as possible to their present locations to avoid concentrating flows;
- Dissipating concentrated surface flows out of drainage culverts in the orchid and Swamp Mahogany area;
- Designing stormwater treatment devices to maintain existing flow paths and regimes;
- Constructing and maintaining appropriate drainage structures, sediment traps and other mitigation structures to minimise the likelihood of run-off from the road surface entering the environment without removal of contaminated substances such as oil and heavy metals;
- Implementing 'best practice' management of surface water quality during construction and operation, by minimising soil erosion and trapping a high proportion of suspended sediments, adsorbed metals, nutrients and hydrocarbons;
- Taking account of spill scenarios during design of water treatment facilities;
- Separating road run-off from undisturbed run-off, prior to treatment and discharge; and
- Undertaking regular maintenance of drainage structures during operation to ensure that blockages do not occur.

Further information gained from additional studies conducted since the exhibition of the EIS and SIS, particularly in relation to bridging options and hydrological regimes, is provided in Chapter 6 of this Submissions Report.

4.9 Heritage

4.9.1 General

In summary, respondents to the EIS and SIS raised the following issues:

- There is concern over the impact on ten historic sites or features in one small area, and the destruction and loss of heritage and proposed heritage items as a result of Option E.
- Bulahdelah (Alum) Mountain is the most valuable heritage area in Bulahdelah, with a collection of unique Indigenous, Non-indigenous and natural heritage values. Every effort must be made to ensure that minimum disturbance takes place in this area.
- The EIS is considered to have provided an adequate assessment of the heritage impacts of the work in Section 7.3 of the EIS.

Submissions:

12, 14, 16, 32, 43, 47

Response:

The EIS notes that the Bulahdelah upgrade of the Pacific Highway would directly affect ten historic sites or features. This number of items and their occurrence within a relatively small area does not provide a good measure of the severity of the development impact. This number of recordings in a small area is a reflection of the comprehensive nature of the archaeological survey, and the proximity of the study area to the Bulahdelah township and its associated industrial areas. As a consequence, there are many recordings such as fence lines, borrow pits, quarries, road remnants and dumps which are of negligible or low significance and represent the accumulation of past occupation traces around a township. It is acknowledged that the Upgrade would result in the loss of some heritage values, however the recommended program of mitigation works would minimise the extent of this loss, and generate valuable information on affected features which may otherwise have never been produced.

The Indigenous and Non-Indigenous cultural heritage values of the Bulahdelah (Alum) Mountain are well documented in the EIS. It is acknowledged that the Mountain is one of the integral heritage components of the Bulahdelah area. The RTA supports the view that potential direct and indirect impacts of the Upgrade on cultural heritage values should be minimised. The program of mitigation works proposed in the EIS provides the most effective means for minimising disturbance to cultural heritage values in the event that the Upgrade is approved.

The respondent's appraisal of the heritage assessment within the EIS is noted.

4.9.2 Indigenous Heritage

In summary, respondents to the EIS and SIS raised the following issues:

- Concern over the derogatory manner in which the EIS Summary Book treats Indigenous Heritage. No mention is made of the "strong basis for treating seriously the possibility that Aboriginal burials occurred on the (Bulahdelah) mountain" outlined in Appendix 2 of Volume 7.
- The significance of Bulahdelah Mountain, in regard to indigenous heritage, was established in 2000, when Option E was one of five options being considered.
- The Karuah Land Council has a pecuniary interest in the approval of Option E, possibly indicating why Karuah Land Council has shown little interest in the Indigenous heritage of Bulahdelah (Alum) Mountain. Concern has been shown for this heritage by the Forster Local Aboriginal Land Council. Many Worimi Elders regard Bulahdelah (Alum) Mountain as being of immense spiritual and cultural importance.
- The information presented in the EIS in relation to the "healing stream" is incorrect. Only one of the dams is not natural and therefore the hydrology of the "healing stream" could not have been altered by this second dam.
- The "Guardian Tree" is of strong Aboriginal significance, and importance to the Worimi and Biripi Elders.
- Indigenous sites located within the footprint of Option E have been trivialised by playing the Forster and Karuah elements of the Worimi People against each other.

- Option E is pre-emptive as the Aboriginal cultural status has not been clarified by the RTA, and therefore destruction of Aboriginal sites should be considered.
- The DEC supports the proposed management recommendations for Aboriginal objects, noting that further consultation is required, including the feasibility of the proposed Aboriginal Place nomination for Bulahdelah (Alum) Mountain.

Submissions:

10, 12, 16, 30, 31, 32, 34

Response:

The EIS Summary Book is necessarily limited in its scope and the summarised format does not necessarily allow for the communication of all the issues which have contributed towards the management recommendations.

The issue of reported Aboriginal burials on the Bulahdelah Mountain was investigated in a separate analysis in 2001. The findings of this analysis were included within section 4.2 of the EIS Technical Paper 16, and the majority of the 2001 report was repeated as Appendix 2 of that Paper. The analysis found that oral traditions were not corroborated by documentary evidence, or from evidence predating the upgrade Proposal. Despite this, the fact that two apparently independent oral sources related the same account, 'provided a strong basis for treating seriously the possibility that Aboriginal burials occurred on the mountain'. However, in the absence of any surface archaeological indications or specific oral information regarding potential burial locations, only general impact mitigation strategies can be instigated in response to this finding.

The Upgrade project would include standard strategies with regard to potential burial remains. These consist of the exclusion by the DEC of human skeletal material from any section 90 heritage impact permits provided (refer to the note at the end of this section for further discussion on section 90 permits), and the adoption of standard 'stop work' protocols in the event of the discovery of skeletal remains.

The declaration of the Bulahdelah Mountain as an Aboriginal Place is a proposal currently under consideration by the DEC. An analysis by Umwelt Environmental Consultants of the feasibility of this proposal was commissioned by the DEC in 2003 however the proposal is yet to be formally adopted or executed by the DEC.

The status of Bulahdelah (Alum) Mountain as a place of Aboriginal cultural heritage significance has been recognised since the early stages of the environmental assessment of the Bulahdelah Pacific Highway Upgrade. The potential impacts of the various route options on the Aboriginal cultural significance of Bulahdelah Mountain were considered as part of the process that identified the current route as the preferred Upgrade option.

All of the Aboriginal groups and individuals involved in the consultation for the Upgrade assessment have expressed concern for the Aboriginal cultural values of Bulahdelah Mountain. The interpretation of those values and their manifestation does however differ across some groups and individuals. All groups have acknowledged the high value and significance of the upper slopes of the Mountain. The impact of the Upgrade, which would occur on the lower slopes, is not however the subject of a consensus view by the Aboriginal community.

All of the documentary and field evidence available to the consultants indicates that the two water impoundments on the stream in question are of human origin and have been constructed through the manufacture of a dam wall and/or the artificial excavation of valley

floor sediments. Both of these 'dams' therefore represent a significant modification to the hydrology of the streamline.

References to the Aboriginal cultural significance of the 'Guardian Tree' are documented in sections 4.3.2 and 4.3.3 of Technical Paper 16 of the EIS. The cultural significance and interpretation of this feature has been determined by the Karuah Local Aboriginal Land Council (LALC), in accordance with its role as the primary advisory group for sites in the Bulahdelah area. The Karuah LALC does not consider this tree to have significance according to the cultural traditions of its members, the Karuah Aboriginal community, or the Alum Mountain. The Karuah LALC in keeping with its statutory role has requested that the section of 'Guardian Tree' containing the burl be salvaged and set aside in an appropriate local area, in order to respect the views of those with a different view on the significance of the 'Guardian Tree'.

Representatives from both the Karuah LALC and the Forster LALC have been involved in the Aboriginal community consultation program for the Upgrade project. As part of this program invitations were extended to all consulted parties to provide assessments of the significance of the Aboriginal sites which may be affected by the Upgrade development. All information regarding Aboriginal cultural significance has been treated seriously in the assessment, and where consistent with publication protocol, reported in Technical Paper 16 of the EIS. It is recognised that the interpretation of sites and the assessment of cultural significance varies across the Aboriginal community, its Elders, and various representative organisations. In the event of conflicting interpretations and assessments, the DEC has advised that the Karuah LALC is to be considered the primary advisory group for sites in the Bulahdelah area and that the Karuah LALC must take into consideration all of the views presented to them when advising the RTA on the management of these sites.

Representatives of the local Aboriginal community have been regularly consulted about heritage issues and survey findings arising from the Upgrade assessment through the meetings of the Aboriginal Liaison Group and the distribution of the Notes from these meetings. Members of the primary consultation group, the Karuah LALC, have participated in the archaeological survey of the study area, and in monitoring of geotechnical test locations. The KLALC has advised the RTA throughout the Upgrade assessment that a highway route on the east side of the Myall River was preferable to a western alignment which was considered to pose a greater potential impact to Aboriginal cultural heritage values. Discussions with representatives of the KLALC have been conducted regarding all of the archaeological survey results, together with all other reported sites documented in the EIS. In all cases representatives of the KLALC have indicated that the impact of the Upgrade on Aboriginal cultural heritage values can be effectively mitigated by conducting the management recommendations described in the EIS. Representatives of the KLALC have indicated that there are no Aboriginal sites or places within the construction footprint of the Upgrade which are of a significance which would prevent construction of the highway.

The support of the DEC for the proposed management recommendations for Aboriginal Objects is noted. Further consultation with representatives of Aboriginal groups and the Karuah LALC has been undertaken since the exhibition of the EIS, and the results of this are discussed in Chapter 5 of this Submissions Report. The DEC also anticipates consultation regarding the proposed Aboriginal Place nomination for Bulahdelah Mountain. The feasibility of such a nomination and the determination of appropriate boundaries is a matter for the DEC as the statutory authority regarding Aboriginal Places.

Note: In relation to seeking section 87 permits and section 90 consents issued under the National Parks and Wildlife Act 1974 (NP&W Act) and recent reform of the EP&A Act, the RTA will request approval for the entire Proposal under Part 3A of the EP&A Act. If Part 3A approval is granted by the Minister for Planning prior to any need to seek NP&W Act approvals, then the latter would not be required. However, it is expected that the requirements of the NP&W Act in relation to this Proposal would be included within the Part 3A approval. In the event that the RTA seeks further investigation and/or harm of identified Aboriginal heritage items to the extent a permit or consent is needed, prior to any Part 3A approval, formal application would be made under the NP&W Act.

4.9.3 Non-Indigenous Heritage

In summary, the respondents to the EIS and SIS raised the following issues:

- Option E would result in sites of National Heritage Significance being fragmented and destroyed. The Alunite Mine site Complex, unique in at least an Australian context, currently has cohesion, however this would be lost should Option E proceed. The Mountain Park would also be affected which was the home of the Mine Manager, and the Processing Plant. The recent discovery of an in-ground clay brick crucible represents the only surviving relic of the processing of Alunite on the Alum Mountain. There is also the potential for the area to contain artefacts that have not yet been found or known about.
- The private burial ground of Ada King would be greatly disturbed by Option E and re-designing that is planned for Mountain Park.
- Rachel Hemming's Bulahdelah Home would be substantially compromised by the Option E construction despite minor alterations to the route. The safeguards proposed are essential and must be adopted.
- If geotechnical stabilisation measures are required, then it would result in the alteration of an identified Heritage Item, Bulahdelah (Alum) Mountain.
- Many deaths occurred on the Bulahdelah Mountain, and crosses have been erected there to commemorate the men and children who lost their lives there during mining operations. The entire mountain should be treated as an area of significance.
- The sandstock brick platform has been listed in the Great Lakes Draft Heritage Study.
- The clay brick loading wall is a non-relocatable relic and interfering with this structure cannot be justified.
- Key survey maps from the mining operations of the Alum Mountain, showing the extent of the site have not been included in the EIS.
- The EIS refers to the requirements for Permits under Section 140 of the NSW *Heritage Act 1977* in relation to the following sites: BH3, BH8 and BH12. This information contradicts the advice that item BH3 the remnant fence, lies adjacent to the area of construction and that detailed design would be undertaken to avoid any impact. If the fence is affected by the works it may be more appropriate for the fence to be included within the proposed Exception application than within a S140 permit application.
- The management recommendations included within the EIS include reference to the 'relics' provisions of the *Heritage Act 1977* and the need for applications under Section 139(4). The correct term for these applications is 'Exception'. The EIS should refer to the following sites/items as requiring an Exception under S139(4): BH2, BH6, BH10 and BH11.
- The Alunite Mine Historic Precinct (Site BH12) is an item of high significance. The new road corridor would impact the mine site. It is appropriate that the EIS has noted that the requirements for a permit under Section 140 of the NSW *Heritage Act, 1977* for an archaeological testing and salvage program.

- The statutory protection of the mine site through inclusion on the State Heritage Register may be appropriate in the future and strongly supports the preparation of a Plan of Management for the site as recommended in Section 7.3.1 of the EIS. A Plan of Management would be an extremely useful document to accompany any future Section 140 Application made to the Heritage Council.
- Any development on the initiatives for the future management of the Alunite Mine site, during and after the intended highway upgrading, should be conducted in consultation with the NSW Heritage Office.

Submissions:

7, 10, 12, 14, 16, 18, 31, 32, 37, 47

Responses:

The Alunite Mine Complex has been assessed as having National heritage values. These values rest in various historical aspects of the venture, the nature of the deposit, and the establishment of a processing works. The Complex comprises the remains of the Alunite mine operation including extraction, processing and transport. The complex is an archaeological site and consists of the quarry pits and trails on the upper Mountain, together with residual remains further downslope including surface features and archaeological deposits. The Complex has been fragmented and affected by existing land use activities and developments including road construction, park development, quarrying and service easements.

The Complex extends from the crest of the Mountain, to the site of the former loading jetty on the Myall River. Any proposed highway alignment situated between the Myall River and the crest of the mountain, must therefore impact the Alunite Mine Complex. The upgrade Proposal presented in the EIS would cross the Mine Complex in an area already disturbed by the installation of overhead power lines, a cleared easement and service track. In this context, and in consideration of the extensive mitigation measures proposed, the impacts of the Proposal in this area can be viewed as minor. The placement of the highway along the existing easement is a deliberate strategy to minimise impact to the Mine Complex and to the associated Mountain Park.

A degree of unavoidable direct impact would occur to known and potential subsurface remains of the mine complex within the construction footprint of the Upgrade. These impacts would be mitigated by the conduct of salvage excavation, salvage and recording. Despite this level of impact, the majority of the former processing works would be conserved and retained as part of Mountain Park. The Park would also conserve the site of the former mine manager's residence. A low brick platform, interpreted as the remains of a kiln/furnace, is situated to the east of the proposed highway and would be conserved and managed in the context of the highway easement. This is one of a number of surface and archaeological features which relate to the original processing works, nearly all of which would be conserved within Mountain Park following construction of the Upgrade (refer Figure 6.1, in EIS Technical Paper 16). A proposed highway overbridge with a sympathetic style of design, would maintain access for both pedestrians and vehicles across the mine complex, and help to maintain spatial cohesion between its various nearby elements.

The approximate location of the reported burial ground managed by Ada King has been identified through a number of oral testimonies (refer Section 5.4.1 and Figure 5.21 in EIS Technical Paper 16). This area does not occur within the construction footprint of the Upgrade and would not be affected by construction activities (refer Figure 6.1 in EIS Technical Paper 16). Strategies, such as temporary fencing would be employed to ensure that construction activities in the area of Mountain Park do not encroach beyond a minimal

disturbance zone. The EIS proposes the creation of a Management Plan for the Mountain Park with the aim of defining the effective conservation management and interpretation of its heritage values. Any re-development of the Mountain Park would follow the provisions of such a Management Plan (refer Recommendation 21 in EIS Technical Paper 16).

The site of Rachel Henning's Bulahdelah home would not be directly affected by the Proposal, however the landscape context of the site would be altered by the adjacent alignment of the highway. Safeguard measures as outlined in the EIS, Technical Paper 16 would be adopted.

Geotechnical stabilisation works would not require any further impacts than those described in the EIS. Geotechnical stabilisation works would be sub-surface and not change the character or significance of Bulahdelah (Alum) Mountain.

The heritage values of the Bulahdelah Mountain have been variously recognised in the past via the listing of the mountain range above 180 m on the Register of the National Estate (RNE), and the listing of the alunite mine on the Great Lakes Local Environmental Plan (LEP) 1996 (refer section 5.3 of the EIS Technical paper no.16). A 2003 report to the DEC by Umwelt Environmental Consultants concluded that the mountain is highly significant in past and present Aboriginal tradition and recommended the establishment of an Aboriginal Place. The report recommended that the Aboriginal Place consist of the western portion of Bulahdelah State Forest but did not provide an analysis or justification of these boundaries (refer section 4.2 of the EIS Technical paper no.16). Since the drafting of the EIS report, the Great Lakes Council has placed a Draft Heritage Study on public exhibition for review and comment. This draft report proposes the establishment of a Heritage Conservation Area across the Mountain. The proposed boundaries are largely inclusive of all previously listed or proposed areas, together with some adjoining land portions. A justification for the proposed boundaries is not provided.

With the exception of the RNE area, the Proposal would have varying impacts on the areas included within these existing or proposed heritage areas. Any geotechnical works required for the stabilisation of the road corridor would form part of this impact. The only declared and formerly listed heritage item which would be affected by the Proposal is the 'Former Alum Mine' as listed on Schedule 2 of the Great Lakes Local Environmental Plan. This listing imposes certain obligations on the Great Lakes Council in the consideration of development applications, planning controls and potential conservation and promotional strategies.

The EIS recognises a suite of cultural heritage values related to the Bulahdelah Mountain. The EIS assesses the potential impact of the Proposal relative to these values and places this assessment within a broader comparative context including other environmental, social, economic and engineering opportunities and constraints.

The Bulahdelah Mountain contains a suite of cultural heritage values, and some of these are difficult to define using rigid geographic boundaries. The history of deaths related to mining activities on the mountain is no exception.

If it is recognised that the whole of the mountain has significance based on the events and sites situated upon it, then it must also be recognised that the Mountain forms part of, and supports, an active human environment which itself, is the cause of on-going and evolving physical impacts on the mountain. This is inclusive of the major environmental impacts caused by the alunite mine, and the Bulahdelah town. The town has and continues to transform the slopes of the mountain into an urban and developed landscape. Both the town and the former mine contribute major historic themes to the significance of the Mountain. Recognition of these values need not, and should not, prevent the continuation of the human activities or traditions which created them. Both the mine and the highway can be seen as

intimate components of the Bulahdelah town and all three pose an impact on the Mountain. It follows that respect for the deaths which occurred on the mountain, and any consequential significance of the mountain, is not necessarily incompatible with the continued development of the mountain, the town, or its infrastructure.

It is noted that the Draft Great Lakes Heritage Study itemises a number of brick remnants of the former alunite mine, and proposes a heritage conservation area that is inclusive of mine remnants in or near the Upgrade construction areas. The EIS proposes the in situ conservation management of the brick platform within the context of the upgraded highway easement (refer in Technical Paper 16 to recommendations 21(f), 21(l) and 21(m)). This feature is interpreted to be the remains of a former kiln/furnace.

The feature referred to by respondents as a clay brick loading wall is interpreted as part of the remains of a former kiln/furnace. The EIS proposes the in situ conservation management of this feature within the context of the upgraded highway easement (refer in Technical Paper 16 to recommendations; 21(f), 21(l) and 21(m)). In order to effectively manage this feature it is also proposed to conduct recording, exploratory excavation, and limited restoration with the aim of better understanding the nature of the surviving structures; and stabilising the structure so that increased public visitation would not pose a significant risk of deterioration.

There are fourteen figures in the EIS Technical Paper 16 which present relevant sections of historic parish maps and survey plans which illustrate the extent of the alunite mine workings throughout their operational history (refer Figures 5.5, 5.6a, 5.6b, 5.7a, 5.7b, 5.8a, 5.8b, 5.8c, 5.9, 5.10, 5.11, 5.12, 5.13 and 5.14). These consist of a selection of the key historic maps available at the time of publication.

The EIS inclusion of the remnant fence line BH3 as a feature requiring a section 140 permit was a precaution in the event that the proposed avoidance of this feature proved to be impossible. This allowance was detailed in recommendation number 17 in the EIS (Technical Paper no.16). Unfortunately the provisional nature of this strategy was not detailed in the main EIS report. The advice from NSW Heritage Office is noted regarding the submission of an Exception application in the event that impact to this feature is anticipated.

The advice from the NSW Heritage Office is noted regarding the use of the term 'Exception' as reference to an application under section 139(4) of the Heritage Act.

It is noted that the NSW Heritage Office consider to be appropriate the EIS proposal to apply for a permit under Section 140 of the Heritage Act for the conduct of an archaeological testing and salvage program within the Alunite Mine Complex (Site BH12).

It is noted that the NSW Heritage Office considers that the inclusion of the Alunite Mine Complex on the State Heritage Register may be appropriate in the future. The Heritage Office also supports the preparation of a Plan of Management for the Complex, as proposed in the EIS. The suggestion by the NSW Heritage Office that the Plan would be a useful document to accompany any future Section 140 application relating to the Complex is noted.

The requirement for any development of future management initiatives for the Alunite Mine Complex, during and after the intended highway upgrading, to be conducted in consultation with the NSW Heritage Office is noted.

Note: In relation to seeking formal exceptions and S140 approvals issued under the Heritage Act and recent reform of the EP&A Act, the RTA will request approval for the entire Proposal under Part 3A of the EP&A Act. If Part 3A approval is granted by the Minister for Planning prior to any need to seek Heritage Act approvals, then the latter would not be required. However, it is expected that the requirements of the Heritage Act in relation to this Proposal would be included within the Part 3A approval. In the event that RTA seeks further investigation of identified heritage items to the extent an approval is needed, prior to any Part 3A approval, formal application would be made under the Heritage Act.

4.10 Air Quality, including Health

4.10.1 General

In summary, respondents to the EIS and SIS raised the following issues:

- The elevated level of Option E, local topographical features, wind conditions and thermodynamics experienced throughout the area would expose the two local schools and the community to toxic highway pollution and dust during construction and operation. In the Summary Book, there is practically no mention of the detrimental effect of toxic highway fumes.
- There is no known safe exposure level to diesel exhaust for children and the EIS acknowledges that the Pacific Highway carries relatively high numbers of heavy vehicles – 19.5% of total traffic.
- Confirmation is required that air quality at schools and residents would still be acceptable 10 years after opening based on projections in the EIS.
- Option E would reduce the air quality at Alum Mountain which is currently excellent.
- The generation of dust during construction and the associated health risk is not acceptable.
- The impacts of poisonous alum dust during construction should be considered. There is no mention of the health effects of poisonous alum dust on residents.
- The DEC request that work be carried out in a manner that minimises adverse effects on the amenity of local residents and sensitive sites, and limits the effects of emissions on local and regional air quality. In addition the RTA should consider making all fixed material transfer points enclosed and fitted with dust control devices, mobile conveyers are enclosed, and material stockpiles are managed to prevent or minimise the emission of dust.

Submissions:

7, 9, 10, 11, 14, 17, 19, 21, 27, 30, 31, 37

Response:

Changes to air quality are discussed in Section 7.5.2 of the Main Volume of the EIS and analysed in detail in Technical Paper 15 - Air. As stated in the EIS, a comparison of the predicted levels of the key parameters carbon monoxide, nitrogen dioxide, particulate matter and benzene indicate that all would remain well within air quality goals, even within close proximity to highway traffic in 2008 and 2018. Due to the added distance away from the operating Pacific Highway, the air quality at schools and residences currently adjacent to the existing highway would be improved by the operation of the Proposal, at opening and in 2018. The conclusions reached in the air quality analysis included consideration of the local topography, prevailing wind conditions and thermodynamics. There is no reference to air pollutants within the Summary document because the impacts in relation to air quality as a result of the Proposal are considered minor.

Dust would be generated during construction of the Proposal. This would depend on soils, their moisture content and the type of construction activity being conducted. Dust suppression measures would be implemented and monitored during the construction period. The generation of dust during construction would be managed by various methods to meet criteria set by the DEC, and outlined in the Construction Environmental Management Plan. Monitoring would also be undertaken to ensure that these criteria are met. The monitoring and suppression of dust impacts would be conducted with particular attention given to potential impacts on local schools.

The changes to air quality are discussed in Section 7.5.2 of the EIS and in detail in Technical Paper 15 - Air. The calculation of vehicle emissions and conclusions have taken into account the traffic mix of light and heavy vehicles, both petrol and diesel driven. With the operation of the Proposal, air quality would remain well within air quality goals, and would improve current conditions to those experienced by the residents of Bulahdelah at opening and in the future. Air quality improvements would continue to be gained by government policies such as improved fleet age structures, new emission standards and changes to fuel characteristics.

For all parameters of vehicle-generated air quality it is predicted that the concentrations of pollutants at residences and schools in Bulahdelah, at opening and in 10 years from opening would be significantly lower than current DEC air quality goals. The Proposal would result in an improved air quality result for the residents of Bulahdelah relative to the current highway, especially during peak periods where long delays and corresponding temporary reductions in air quality are currently experienced.

It is acknowledged that there would be localised reductions in air quality adjacent to the Proposal, compared to the current situation. However, predicted levels of the key parameters carbon monoxide, nitrogen dioxide, particulate matter and benzene indicate that all would remain well within air quality goals, even within close proximity to highway traffic in 2008 and 2018.

Dust generation during construction would be managed as outlined in the EIS in relation to DEC criteria, and is expected to have relatively minor impacts on residences due to the distance of houses from construction. Dust would be managed by an Air Quality Management Plan in consultation with DEC.

The potential for alum dust and its effects on human health and the environment were considered and discussed in Section 7.5.2. of the Main Volume of the EIS and in detail in Technical Paper 15 – Air. Alum is produced from a naturally occurring, mineral called alunite, which is in itself not harmful to human health. Alum does not occur naturally, and is soluble in water, creating sulphuric acid. Alum has not been produced at Bulahdelah since 1950. Any residual alum would have dissipated into the environment by the action of rain water. Under the circumstances there is a negligible risk that alum dust would be generated during construction, and therefore there is no risk to human health.

The Contractor would consider enclosing all fixed material transfer points and mobile conveyors, depending on the location of equipment, and the magnitude of dust issues. Dust control devices and measures would be implemented to minimise the emission of dust from stockpiles.

4.11 Safety

4.11.1 General

In summary, respondents to the EIS and SIS raised the following issues:

- Option A would remove the safety risk to motorists from rocks being thrown by pedestrian traffic from the proposed Alum Mountain access bridge.
- The upgrade of the highway may facilitate motorists 'pushing themselves' and increasing the risk of driver fatigue.
- Option E, during construction and operation, may inhibit access to the mountain for general forest management including bushfire management and suppression, and presents a risk to the safety of the general public.
- The proximity of the golf course's 4th fairway to the public access road presents a safety concern for the travelling public. Therefore, consideration should be given to the buffer zone, and height and type of materials used in a barrier.

Submissions:

12, 28, 33, 44

Response:

The Mountain Access Overbridge and any other overbridges with the potential to carry pedestrian traffic would include safety screens to prevent objects being thrown onto the proposed Upgrade.

The upgrade of the Pacific Highway is designed to improve road safety. There is no evidence that better roads increase the incidence of driver fatigue. Measures including driver education and the provision of rest areas are implemented by the RTA to prevent driver fatigue.

Access for emergencies and general forest management to Bulahdelah (Alum) Mountain and associated State Forest areas would be maintained during the construction of the Proposal through consultation between the construction contractor and Forests NSW.

The safety issue related to danger for traffic using the access road to the waste facility and sewage treatment plant from the use of the 4th fairway of the Bulahdelah Golf Club would be addressed during the detailed design phase.. The suitability of protective measures such as a buffer zone or a barrier fence to protect road users would be considered during detailed design, in consultation with the relevant stakeholders.

4.11.2 Geotechnical

In summary, respondents to the EIS and SIS raised the following issues:

- The lower slopes, cliffs, monoliths and disused quarries of Alum Mountain are considered physically and geologically unstable and would present a safety risk during construction to construction workers and during operation to the general public. Extensive stabilisation measures would be required to ensure an adequate level of safety.

Submissions:

9, 14, 16, 18, 20, 21, 32, 37

Response:

An assessment of the risks of geotechnical failure and the measures to reduce risks are discussed in section 7.2.2 of the Main Volume of the EIS, and within Technical Paper 11 – Topography, Geology and Soils. The assessed risks were found to be either within acceptable limits or were not considered to be credible risks.

4.12 Soils

4.12.1 Contaminated Soils

In summary, respondents to the EIS and SIS raised the following issues:

- The DEC states that stockpiles of contaminated soils require management to prevent runoff leaving containment areas.
- The EIS does not classify the decommissioned sewer treatment works as contaminated land. There needs to be a consideration of DEC requirements for the assessment and remediation of the site prior to construction.

Submissions:

30, 42

Response:

Contaminated sites are discussed in Sections 7.2.1 and 7.2.2 of the Main Volume of the EIS and within Technical Paper 11 – Topography, Geology and Soils. There are several sites within Bulahdelah that potentially contain contaminated soil that may need to be stockpiled. Stockpiles would be contained and measures to prevent runoff from these stockpiles of contaminated soils would be implemented. These measures would be outlined in the CEMP.

Contaminated soils are discussed in Section 4.10 within Technical Paper 11 – Topography, Geology and Soils. Testing of contaminated soils was conducted on a number of sites including the decommissioned sewer treatment plant adjacent to the Myall River. The recommendation from the findings of these investigations is that no remedial work is required. However, further investigations and consideration of DEC requirements for the assessment and remediation of this site would be conducted prior to construction.

4.12.2 Acid Sulphate Soils

In summary, respondents to the EIS and SIS raised the following issues:

- The DEC states that windblown acid sulphate soils have the ability to adversely impact on waters. Stockpiles should be managed to prevent the generation of windblown materials from the containment areas.
- Acid Sulphate soils are a relatively recent ingredient in earthworks considerations, and can be managed with appropriate attention to detail.

Submissions:

20, 30

Response:

Potential acid sulphate soils are discussed in Sections 7.2.1 and 7.2.2 of the Main Volume of the EIS and within Technical Paper 11 – Topography, Geology and Soils. Generally, potential acid sulphate soils would not be disturbed during the construction of the Proposal, however, an Acid Sulphate Soils Management Plan (ASSMP) would be prepared and implemented by the construction contractor. In the unlikely event that potential acid sulphate soils need to be stockpiled, measures would be implemented to contain windblown material.

The ASSMP would ensure that acid sulphate soils are managed appropriately throughout the construction of the proposed Upgrade.

4.13 Water Quality, Hydrology and Sedimentation

4.13.1 General

In summary, respondents to the EIS and SIS raised the following issues:

- There is a risk of increased flooding in the future and in light of this, there is concern expressed as to why the planned highway would provide a solid embankment downstream of Bulahdelah.
- The suggestion is made that the positioning of the floodplain culverts for the southern section of the alignment be considerate of the northern and southern wetland areas to maintain connectivity of hydrological flow between the eastern and western sides of the alignment.
- Option E would have the potential to affect residents in areas of the town that are already flood prone. There is uncertainty as to how many residents would be affected by increased flood levels during a 1 in 100 year flood event.
- Have the best resources been used in making calculations for the impacts on water quality and flooding?
- There is concern that the water quality of runoff from Alum Mountain would be affected by Option E.
- The DEC commends the RTA's initiative to convert some of the sediment basins used during construction into water quality basins to capture road runoff and contain chemical spills at the completion of works.
- Locating the stockpile of excess materials on the floodplain has the potential to allow sediments to enter waterways in times of flood. This is not supported as it could result in sediments being carried into the Myall Lakes, a wetland of national significance.
- There is concern over the impacts associated with Option E in relation to Alum reaching the Myall River System.
- The DEC requests that the detailed design of any concrete batching plant needs to incorporate a segregation of the site into "clean" and "dirty" areas. The "dirty" area is that area of the site in which any runoff may be contaminated by cement material or other chemicals (e.g. batching plant, washout pits). The "dirty" area should be as small as possible and all runoff from this area collected for re-use. The "clean" area is the remainder of the site and may contribute sediment to any runoff from the site (e.g.

aggregate storage are, site office). The runoff from the "clean" area should be collected and treated prior to discharge.

- The DEC states that the design of sediment basin settling volumes should be capable of controlling run-off from a 90th percentile 5 day rainfall event where practicable. Sediment basins with settling volumes sized to contain run-off less than a 90th percentile 5 day rainfall event would need to be justified at the time of submitting an application for an Environment Protection Licence.
- During the design of sediment basins, consideration must also be given for the protection of sensitive flora, fauna and cultural heritage sites within the road corridor, particularly commitments made within the SIS.
- The DEC states that activities in the cut section at the base of Bulahdelah Mountain, and at the location of the new bridge over the Myall River need to be appropriately managed to minimise the transportation of sediment and other contaminants off site.
- Meeting the water requirements for the project from town water alone is unlikely. The use of water from the Crawford River for construction water would be discouraged or even banned during drought conditions.

Submissions:

10, 14, 24, 26, 30, 37, 42

Response:

Changes to flooding behaviour that would result from the Proposal are discussed in Section 7.2.2 of the Main Volume of the EIS. Results of flood modelling and detailed discussion are contained in Technical Paper 8 – Water.

There is no evidence to suggest that flooding frequencies or severities would increase in the future. It is proposed that a bridge of approximately 210 metres in length be constructed across the Myall River and a portion of the floodplain. There is also approximately 204 square metres of culvert openings proposed in the embankment. Flood modelling was conducted based on this concept design. Results of the modelling and the impacts of changes to flooding are discussed in Section 7.2.2 of the Main Volume of the EIS and in Technical Paper 8 – Water. Modelling indicates that there would be afflux from the Proposal of 260 millimetres and 120 millimetres for the 100 year average recurrence interval and 20 year average recurrence interval events respectively, between the proposed bridge and the existing Pacific Highway bridge. There are only small impacts resulting from the change in flood behaviour expected in this area. There would be no change to the existing afflux upstream of the existing Pacific Highway bridge and on the town of Bulahdelah.

The location of supplementary waterway openings beneath the Proposal across the Myall River floodplain would be determined during detailed design. These locations would consider the need to maintain connectivity of water flow between portions of the northern and southern wetlands.

Section 7.2.2 of the Main Volume of the EIS and Technical Paper 8 – Water outline the changes in flood behaviour that would result from the construction of the Proposal. There is no change to afflux upstream of the existing Pacific Highway Bridge across the Myall River, therefore no impacts on homes within the village of Bulahdelah. There is approximately 260 millimetres afflux between the proposed bridge and the existing bridge during a 1-in-100 year flood event. As a result, two properties would be affected during this event. These are shown in Figure 7.9 of the EIS Main Volume. It is proposed that mitigation options would be

assessed and negotiated with the property owners prior to construction of the proposed Upgrade.

The Study Team is listed in Appendix E of the Main Volume of the EIS. Furthermore, it is proposed that further flood modelling would be conducted during the detailed design phase to determine the optimum location and size of supplementary waterway openings.

Water Quality is discussed in Section 6.3.2 of the Main Volume of the EIS and within Technical Paper 8 – Water. Potential impacts on the quality of water running off Bulahdelah (Alum) Mountain during construction and operation may result from soil erosion, discharge of contaminants from road runoff and accidental spills. Measures to protect water quality during construction and operation include physical measures in the design, such as sedimentation basins/ water quality ponds, and management activities such as soil erosion prevention and sedimentation measures. These measures would be included in the detailed design, Contractor's Environmental Management Plan and Soil and Water Management Plan.

The commendation from the DEC for converting some of the sediment basins used during construction into water quality basins is noted.

In the event that excess materials from construction activities were to be stored on the Myall River floodplain, the material would be placed in "lower flood risk" areas and additional erosion and sedimentation measures would be implemented to address risks posed by potential flooding. These areas and measures would be developed in consultation with the DEC and would reflect the potential risks associated with the storage area.

As stated in section 6.3.2 of the Main Volume of the EIS, there is no risk of impacts on water quality of the Myall River system as a result of alum. Alum is a water soluble product of the industrial processing (alunisation) of the naturally occurring mineral alunite. Any residual alum would have dissipated since it was last produced in Bulahdelah prior to 1950.

The detailed design of concrete batching plants would be developed in consultation with the DEC. Sites would be segregated into 'clean' and 'dirty' areas and the water runoff from each of these managed accordingly, as per standard practice.

Discussions in September 2005 with the DEC in regard to sediment basin settling volumes have resulted in amended requirements for controlling runoff. Accordingly, where possible, sediment basin settling volumes would be designed to be capable of controlling runoff from 80th percentile five day rainfall event in non-sensitive areas, and 85th percentile five day rainfall event in areas designated as sensitive, on account of sensitive vegetation habitat / threatened species presence or land availability. Where sediment basins with settling volumes capable of controlling the abovementioned percentile five day rainfall events are not possible, justification would be provided during submission of an application for an Environment Protection Licence.

The design and siting of sediment basins would consider the protection of sensitive flora, fauna and heritage sites within the road corridor. Specific reference to and consideration of the findings of the Species Impact Statement would be made at this time.

Particular attention would be given to the detailed design and construction of the Proposal in the vicinity of the cut at the base of Bulahdelah (Alum) Mountain and the Myall Rivers so that sediments and other contaminants are retained within the road corridor, and treated appropriately before being released.

The water requirements for the construction of the project would be determined during the detailed design phase and suitable sources of water identified by the construction contractor. Water from rivers is under the jurisdiction of the Department of Natural Resources, from whom, if required, appropriate approvals would be sought.

4.14 Noise and Vibration

4.14.1 General

In summary, respondents to the EIS and SIS raised the following issues:

- Schools should not be exposed to noise where an alternative exists.
- Confirmation is required that noise levels at schools and residences would still be acceptable 10 years after opening based on projections in the EIS.
- The noise levels during and after construction, especially in relation to reflected noise bouncing back from Bulahdelah Mountain. Given the elevated siting and reverberation from Alum Mountain, there is concern in relation to the noise level exposure at schools, Alum Mountain Park, the golf course and for the people of Bulahdelah with Option E during construction and operation. The noise source should be moved away from the town and not located above it. As such, the argument pursued in the EIS that noise levels would improve is misleading.
- Specific detail on noise attenuation is sought in terms of barriers and pavement surfaces for the route.
- The DEC notes that the methodology used to determine the criteria for operational noise levels generally appears to be consistent with the requirements of the Environmental Criteria for Road Traffic Noise (ECRTN). The DEC notes that ameliorative measures would be taken where required, including for the Catholic Church and school, and would expect them to be consistent with mitigation procedures and requirements of the ECRTN.
- The DEC notes that noise mitigation measures outlined in the EIS are considered to be satisfactory.
- The DEC requests that a noise, vibration and blast management plan should be developed for the project prior to the commencement of any works.
- The Bulahdelah Water Treatment Plant, both Bulahdelah Reservoirs and the pipelines connecting these two assets should be considered in any vibration monitoring regime or risk assessment. Mid Coast Water should be kept informed of any blasting activities likely to affect these assets. In addition careful consideration should be given in the design of blasts to ensure conformance with DEC criteria.

Submissions:

7, 10, 14, 17, 18, 21, 24, 30, 37, 42, 45

Response:

The impact of noise on sensitive receivers such as schools was considered in the route selection process, including the value management workshop. The selection criteria used for route selection are discussed in Section 4.1.3 of the Main Volume of the EIS and in Technical Paper 3 – Need and Route Evaluation. While Option E performed less favourably in relation to potential noise impacts on schools than Option A, the evaluation of alternatives using social, economic and environmental assessment criteria, and community and stakeholder communications led to Option E being selected overall. The noise levels at both schools in

Bulahdelah would be improved by the proposed Upgrade, compared to the existing highway, and any residual noise impacts can be adequately mitigated to meet government traffic noise criteria.

Traffic noise is discussed in Section 7.5.1 of the Main Volume of the EIS and in Technical Paper 14 – Noise and Vibration. Noise modelling has been conducted on noise levels for the estimated year of opening (2008) and ten years from opening (2018). Noise mitigation measures have been included so that noise levels at sensitive receivers such as homes and schools meet traffic noise criteria ten years from the predicted opening year.

Noise modelling takes into consideration the local topography of the land, including Bulahdelah (Alum) Mountain. The predicted noise levels and mitigation measures proposed to meet traffic noise criteria at schools, Mountain Park and the golf course are discussed in detail within Technical Paper 14 of the EIS, both during construction and operation.

The noise mitigation measures are described in Section 7.5.2 of the Main Volume of the EIS, and in detail in Technical Paper 14 – Noise and Vibration. The measures proposed in the EIS include:

- Use of a noise-reducing road surface from the southern interchange (Station 94530) to the northern end of the southbound carriageway at Frys Creek (Station 99772;

- Construction of barriers to the west of the alignment, at the following locations:

- 2 metres high from Station 96580 to 96710;
- 3.5 metres high from Station 96710 to 96830;
- 3 metres high from Station 96830 to 96980;
- 3.5 metres high from Station 96980 to 97250;
- 3 metres high from Station 97250 to 97300;
- 2 metres high from Station 97300 to 97510;
- 3 metres high from Station 97510 to 98100; and
- 1 metre high from Station 98100 to 98170.

The exact design of these barriers may depend on the results of community consultation and further noise assessment.

Modelling for operational noise and the development of ameliorative measures would be consistent with the requirements of the Environmental Criteria for Road Traffic Noise, as identified in Technical Paper 14 of the EIS.

It is noted that the DEC considers the noise mitigation measures outlined in the EIS to be satisfactory.

A Noise, Vibration and Blast Management Plan would be developed for the project prior to the commencement of any works. Matters for consideration when preparing the plan will include compliance standards; community consultation; complaints handling monitoring/system; site contact person to follow up complaints; mitigation measures; design/orientation of the proposed mitigation methods demonstrating best practice; operational times; contingency measures where noise complaints are received; and monitoring methods and program, with monitoring to be undertaken at the nearest affected residential properties.

The Bulahdelah Sewage Treatment Plant, water reservoirs and associated pipelines would be considered in a vibration monitoring regime and risk assessment. Mid Coast Water would be kept informed of any blasting activities likely to affect these assets. Blasts would be designed to ensure conformance with DEC criteria.

4.15 Environmental Management

4.15.1 EMP Issues

In summary, respondents to the EIS and SIS raised the following issues:

- The DEC states that as part of the Flora and Fauna Management Plan some measures such as translocation trials and arboreal crossings need to be implemented prior to construction.
- Fuels and chemicals need to be stored in appropriately bunded areas to prevent soil, water and groundwater contamination. An Emergency Management Plan should be established to deal with any such chemical spills.
- The Construction Environmental Management Plan and the Soil and Water Management Plan should be submitted with the application for an Environment Protection Licence and prior to any works commencing on the project.
- The DEC states that the strategies outlined in the Soil and Water Management Plan are considered to be appropriate.
- There is a request for a fire management plan to be implemented during the construction phase of the Bypass through Bulahdelah State Forest.

Submissions:

30, 44

Response:

Actions outlined in the Flora and Fauna Management/ Orchid Management Plans would be implemented prior to construction where appropriate, including orchid translocation trials. The placement of facilities such as arboreal crossings would be implemented as soon as practical within the construction timetable following the commencement of works. The timing of the placement of these facilities would be determined in consultation with DEC. The placement of arboreal crossings would consider the impact of construction activities on local fauna populations, and also the feasibility of having these structures in place within an active construction corridor.

Fuels and chemicals would be stored in appropriately bunded areas to prevent soil, water and groundwater contamination. In addition, an Incident/Emergency Response Management Plan would be prepared. This plan would deal with the management of spillages and other related issues.

The Construction Environmental Management Plan and the Soil and Water Management Plan would be submitted with the application for an Environment Protection Licence prior to any works commencing on the project.

It is noted that the DEC consider the strategies outlined in the Soil and Water Management Plan to be appropriate.

A Fire Management Plan would be developed and implemented prior to the construction phase of the proposed Upgrade adjacent to the Bulahdelah State Forest.

4.15.2 General

In summary, respondents to the EIS and SIS raised the following issues:

- Mitigation measures must be achievable and able to be implemented as part of the construction of the Proposal. Impacts that cannot be minimised must also be mitigated against. Despite extensive measures in the concept design, there remain adverse environmental impacts that have not been reduced.
- The DEC states that the monitoring framework in Table 5.I, and Table F.I of the Main Volume of the EIS should be consistent with comments made in the various EIS volumes.
- There is concern from the DEC that the use of 'unsuitable material' as topsoil may reduce the revegetation and rehabilitation works.
- The DEC states that landscape activities should not adversely affect the environment through sediment discharge into waterways.
- Firebreaks should be included along the edge of the Bypass once completed. The Proposal needs to also ensure that existing fire trails are not 'dead ends' which create a safety risk for fire control, suppression and fuel management activities.
- There is concern relating to the appropriate disposal of excess building materials and unused fill off site.
- The adoption of Route E for the Bypass would have an impact on forest management specifically pest and weed management. There should be provision for a pest and weed control plan to be implemented during the construction stage and then maintained for 12 months after completion.

Submissions:

30, 37, 44

Response:

All efforts have been made to propose measures to mitigate impacts resulting from the Proposal and to ensure that these proposed mitigation measures are readily achievable and able to be implemented. The extensive set of environmental management measures is detailed in Appendix F of the EIS. These mitigation measures have been developed subsequent to the refinement of the alignment which successfully avoided numerous impacts, and have resulted from a very large expenditure of resources, and consultation with relevant authorities. It is acknowledged that there remain residual adverse environmental impacts. These are summarised in the conclusion, Section 8.4 of the Main Volume of the EIS.

The monitoring framework in Table 5.I and Table F.I of the Main Volume of the EIS is consistent with comments made in the various EIS volumes.

Unsuitable material would not be used as topsoil. It is proposed in the construction methods that topsoil would be stripped early in the construction phase, stored and re-used as topsoil. Construction methods are discussed in Section 5.9.4 of the Main Volume of the EIS.

It is considered unlikely that there would be any risk of landscaping activities having any adverse environmental impacts through sediment discharge. Notwithstanding this, erosion and sedimentation measures would be implemented so that these activities do not adversely affect water quality within waterways.

Firebreaks along the edge of the proposed Upgrade would be completed where required as part of the construction, in consultation with Forests NSW where appropriate. The

placement and location of firebreaks would also include the consideration of topography and potential impacts on threatened flora and fauna in consultation with both Forests NSW and DEC. Fire trails and access tracks affected by the Proposal are detailed in Section 4.8 of Technical Paper 4 – The Proposal. Where an existing State Forests fire trail is affected, alternative locations would be determined or it would be closed at a suitable location. This would be done in consultation with State Forests, so to maintain emergency access, and safety. Fire breaks would not be constructed in known or potential areas of habitat for threatened orchid species.

The management of waste is discussed in Technical Paper 10 – Energy, Waste and demand on Resources. A Waste Management Plan would be prepared as part of the Construction Environmental Management Plan. The Waste Management Plan would be in accordance with RTA QA Specification G36 – Environmental Protection (Management System) and would include:

- Identification and classification of major waste streams generated during construction;
- Details of how and where waste would be re-used, recycled, stockpiled or disposed of;
- Details of the receptacles that would be used for storing identified waste before reuse, recycling, stockpiling or disposal;
- Details of how waste would be transported between generation, storage and point of reuse, recycling, stockpiling or disposal;
- Methods for monitoring the implementation of the Waste Management Plan;
- Waste management hierarchy outlined in the Waste Avoidance and Resource Recovery Act 2001, with waste avoidance being the priority, followed by resource recovery and, as a last resort, disposal; and
- Compliance with relevant legislation, guidelines and approvals.

The Flora and Fauna Management Plan will include procedures for weed and pest management and for protecting vegetated areas outside of the direct impact zone. The management plan would be implemented during construction, and for one year following completion. This management plan would be developed in consultation with Forests NSW.

4.16 Utilities and Other Infrastructure

4.16.1 Electricity

In summary, respondents to the EIS and SIS raised the following issues:

- The DEC notes that relocation of the powerlines would be subject to a separate environmental impact assessment process by TransGrid. Clarification is required as to what works are proposed to be undertaken by the RTA and what works would then be the subject of the separate EIA to be undertaken by TransGrid. This is particularly relevant due to the sensitivities within the area and it is critical that any EIA correctly identifies and deals with these issues. There is concern that this Proposal may result in increased impacts to the Orchid species (and threatened species in general). Clarification is required about the ability to retain shrub and ground cover vegetation in the gully line, associated with the powerline easement. In this context, TransGrid state that there have been several discussions with the RTA, and DoP regarding the relocation of the 132kV Transmission Line from Tomago to Taree for the proposed highway realignment. These discussions have focussed on the EIA process, whereby the RTA, would as part of the EIS process include the provision of specialist

environmental services to include the area where the transmission line is to be relocated to. TransGrid state that these studies should support the RTA's undertaking to TransGrid to clear the vegetation and undertake the necessary groundwork for the transmission line relocation, including access tracks. The clearing shall be in consultation with the TransGrid Regional Manager/North. TransGrid would carry out a Review of Environmental Factors in accordance with section 111 of the Environmental Planning and Assessment Act for the remaining work associated with the physical relocation of the transmission line.

- The DEC states that it is important to ensure that any clearance requirements for the proposed powerline relocation are taken into consideration as part of any proposed mitigation works.
- TransGrid states that Figure A of the Main Volume of the EIS shows that the extent of the proposed upgrade may extend to cross the transmission line again on the northern end of the project. The possibility of this crossing at the northern side has not been identified by the RTA to TransGrid in earlier meetings. Confirmation of details at this crossing, if any, would need to be provided to TransGrid for any environmental impact assessment on the part of RTA and TransGrid to enable the highway upgrade to extend to this crossing.
- TransGrid states that the RTA shall bear all costs arising from the relocation of the transmission line including the cost of environmental impact assessments and approvals, environmental management plans, physical transmission line relocation works, associated costs arising from the outages of the transmission line for the relocation work and any other costs that may arise from the relocation of the line.
- TransGrid states that it is difficult to finalise plans for the exact location of the transmission line, as the proposed highway is still in concept plan. TransGrid states that it is its intention to place the transmission line close to the highway, however practical and technical restrictions may require the transmission line to be located further away. TransGrid states that the following additional requirements should be noted: RTA proposed fencing and road cutting should be at least 15 metres away from the realigned Transmission Line centreline; and Access tracks shall be provided by the RTA so that all relocated and existing structures would have 24 hour/ 7 day access.
- TransGrid states that its examination of the EIS documents indicated that the areas surveyed for flora and fauna are adequate for the transmission line relocation. TransGrid also states that the areas of field survey for the cultural heritage (Historic and Indigenous) are confined only to the "footprint of the highway" construction work. These areas surveyed as shown in Figure 5.24 of Technical Paper 16 do not appear to include the area for the relocation of the transmission line and access tracks and are therefore not adequate. The cultural heritage field survey and assessment should be expanded to include the transmission line relocation area as it has been done for the flora and fauna surveys. It is important that the specialist environmental studies are adequate to cover the proposed transmission line relocation; otherwise the relocation process may involve another EIS/SIS process with its financial and time implications.

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Response:

As stated in the EIS, the relocation of the powerlines would be subject to a separate environmental impact assessment process by TransGrid. A description of the works included as part of this Proposal is given in Section 5.9.3 of the Main Volume of the EIS and in Section 7.3.1 of Technical Paper 4 – The Proposal. The RTA would clear the vegetation and undertake the necessary groundwork for the transmission line relocation, including

access tracks. The clearing would be in consultation with the TransGrid Regional Manager/North. Where possible, topsoil would remain undisturbed and ground cover vegetation would be retained within the powerline easement. TransGrid would carry out an Environmental Impact Assessment in accordance with the requirements of the *Environmental Planning and Assessment Act 1979* for the remaining work associated with the physical relocation of the transmission line, including the placement of power poles. Shrub and ground cover vegetation would be retained as much as possible in the gully line at approximate Station 96750. Prior to clearing required for the transmission line relocation, areas where shrub and ground cover can be retained intact within this gully line would be identified and delineated by parawebbing.

Measures to mitigate impacts on native vegetation during clearing of the powerline easement would be included in the Construction Environmental Management Plan and Flora and Fauna Management Plan.

The TransGrid transmission line crosses the proposed Upgrade at the northern end of the Proposal, where it currently crosses over the existing Pacific Highway. The work in the area where the Transmission line crosses the Proposal is generally limited to the reconstruction of the existing road formation within the existing corridor. It is not expected that the transmission line in this area would require adjustment or relocation. Details of this crossing and any potential impact would be provided to TransGrid prior to the commencement of construction.

The RTA would be responsible for the costs arising from the relocation of the transmission line as previously agreed in the Letter of Association signed by TransGrid on 22 October 2003 and the RTA on 27 November 2003.

Detailed requirements for the relocation of the TransGrid powerline would be determined during the development of the detailed design. This would be carried out in consultation between TransGrid, the RTA and the construction contractor. It is acknowledged that while there is an undertaking to locate the transmission line close to the proposed Upgrade, practical and technical considerations would apply. The RTA would continue to work with TransGrid during the detailed design phase in an effort to minimise the impacts on TransGrid's operational and maintenance requirements for the transmission line.

Fencing and cuttings associated with the proposed Upgrade would be at least 15 metres away from the relocated transmission line at the power poles. The power poles have been located to provide as much clearance as possible between the actual transmission line spans and the cut batters for the Proposal given the ecological and heritage constraints of the area. Access tracks would be provided by the RTA so that all relocated and existing structures would have 24 hour/ 7 day access.

Specialist environmental studies undertaken for the EIS, including cultural heritage studies, are adequate to cover the environmental impact assessment of the proposed transmission line relocation. Areas of survey for cultural heritage included the construction footprint, which includes those areas required for the relocation of the transmission line, including construction of access tracks. The assessment undertaken for this relocation has been in accordance with requirements agreed to by the RTA and TransGrid in November 2003.

Water Supply

In summary, respondents to the EIS and SIS raised the following issues:

- A preference for construction depots and stockpiles to be located outside of Crawford River catchment to eliminate the risk of spills or other pollution events affecting water supply.
- The EIS did not consider the affect of airborne pollutants on water supply at the water treatment plant.
- Water supply infrastructure would need to be adjusted or relocated at the following locations: Treated water rising main from the Bulahdelah Water Treatment Plant to the Bulahdelah reservoirs; Gravity main from Bulahdelah Reservoirs to the reticulation; The power and control cables between the Bulahdelah Water Treatment Plant to the Bulahdelah Reservoirs; The scour from the Bulahdelah Reservoirs to the Water Treatment Plant; Reticulation main at the Lee Street/ Pacific Highway Intersection; and the Private water service to the Golf Club crossing under the existing Pacific Highway. In relation to the Lee Street pipeline, it is important to note that the pipeline cannot be located any higher than the existing pipeline, because this is constrained by the height of the existing Bulahdelah Reservoirs. This matter might however be overcome with the installation of the 3rd Bulahdelah Reservoir.
- Mid Coast Water (MCW) states that detailed design and estimation for relocation or adjustment would only be possible once an agreed location for replacement assets has been locked in. MCW's preference is to undertake this work using MCW resources, however recognises that the highway may be procured using a "design, construct and maintain" contract, which may make the use of MCW resources not possible. MCW seek further discussions on this matter, and resolution prior to the procurement of the highway upgrade.
- MCW is interested in acquiring land for a buffer that would be surplus to the RTA's needs between the Bulahdelah Water Treatment Plant and the proposed highway boundary. The RTA's intentions with regards to the purchase of MCW's former Bulahdelah Sewerage Treatment Works site on Bombah Point Road also need to be resolved.
- MCW states that it is considering locating a future balance tank/reservoir adjacent to the site of the northern interchange, and provision for a future water service might be considered across the proposed alignment east of Mountain Park, however this has not been discussed in any detail with the relevant bodies (for example Great Lakes Council). Accounting for this potential pipeline would involve providing adequate space for a pipeline on the new bridge.
- MCW states that previous negotiations with the RTA for the highway upgrade to replace the access to the Bulahdelah Reservoirs with an access track connected to the proposed Northern Interchange at Lee Street. The two issues that need to be considered in the provision of this access track are: The access track need to be constructed to a suitable standard for maintenance trucks, and mobile cranes to travel on, be low maintenance and be well drained; and MCW's preference is to own the land containing the access track, to avoid concerns with crossing paddocks owned by others which are often stocked with cattle, and require fencing and gates. An underpass providing direct access between the Bulahdelah Water Treatment Plant and the Reservoirs has been excluded during previous negotiations, but would still be considered as an option by MCW.

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Response:

Construction depots and stockpiles would be located outside the catchment of the Crawford River catchment to eliminate risks of spills and contamination of the Bulahdelah town water supply.

Airborne pollutants associated with the project include construction and road dust and motor vehicle emissions. The only emissions of potential concern for the water treatment plant would be construction dust particles of sufficient size to deposit in the water treatment units. The emissions from motor vehicle exhausts are either gases or very fine particles which would not contribute significantly to deposition in the treatment units. Lead deposition is not a risk as leaded petrol is no longer sold in Australia (as of January 1 2002).

During construction, dust control measures would be implemented to meet NSW DEC dust deposition guidelines at sensitive receptors. The treatment plant would be considered a dust sensitive industry/operation and measures would be put in place to ensure compliance with the dust deposition goals. These goals are based on nuisance impacts and compliance would also prevent interference with the efficiency of operation of the treatment units. However, as a preventative measure during construction, a dust deposition gauge would be installed at the perimeter of the plant closest to the construction site to monitor dust fallout. If required, control measures in excess of those already proposed would be implemented in consultation with MCW and DEC.

A summary of major service relocations is given in Table 5.3 of the Main Volume of the EIS. Service relocations would be conducted in consultation with relevant utility authorities. The RTA acknowledges MCW's list of infrastructure adjustments that are potentially affected by the Proposal, listed below:

- Treated water rising main from the Bulahdelah Water Treatment Plant to the Bulahdelah reservoirs;
- Gravity main from Bulahdelah Reservoirs to the reticulation;
- The power and control cables between the Bulahdelah Water Treatment Plant to the Bulahdelah Reservoirs;
- The scour from the Bulahdelah Reservoirs to the Water Treatment Plant;
- The reticulation main at the Lee Street/ Pacific Highway Intersection; and
- The Private water service to the Golf Club crossing under the existing Pacific Highway.

The RTA also acknowledges the constraints to the relocation of the reticulation main at Lee Street. MCW would be consulted during the development of the detailed design with regard to this reticulation main.

The design and program of relocation of MCW assets would be conducted in consultation with the RTA and the construction contractor during development of the detailed design. The use of MCW staff and resources for the relocation of these assets would be subject to specific negotiation with MCW, as the Proposal is further developed.

The RTA notes the interest in MCW acquiring land adjacent to the Bulahdelah water treatment plant for the purposes of establishing a buffer area. Negotiations with regard to land acquisition and the disposal of residue land would be conducted between MCW and the RTA on a case by case basis following approval of the proposal.

The RTA acknowledges the MCW future proposal for water infrastructure development. The concept design of the proposed Upgrade has been developed in consultation with government and other stakeholders and provision has been made where required. Any further requirements that may arise since the exhibition of the EIS would be considered during detailed design.

The access track to the Bulahdelah Reservoirs would be connected to the proposed Northern Interchange. The access track would be constructed to a suitable standard for use by maintenance trucks and mobile cranes, be low maintenance and be well drained. The land containing the access track would be either dedicated as public road where there are other adjoining landowners requiring access or transferred to MCW's ownership if there are no adjoining properties. An underpass providing direct access between the Bulahdelah Water Treatment Plant and the Reservoirs is not feasible or cost effective and is therefore not proposed.

4.16.2 Sewerage

In summary, respondents to the EIS and SIS raised the following issues:

- Sewerage infrastructure would need to be relocated or adjusted at the following locations: Sewer rising main at the Lee Street/Pacific Highway intersection; Gravity sewer at the Lee Street/Pacific Highway intersection; Bulahdelah Sewerage Pump Station No.1 would require replacement of pumps if the sewer rising main needs to discharge into the sewer at Lee Street/Pacific Highway intersection at a higher level; and Private sewerage pump line from the Golf Club crossing under the existing Pacific Highway and travelling to the Bulahdelah Sewerage Treatment Works.
- MCW and Great Lakes Council, in consultation with the RTA, Department of Lands, and DEC have agreed on a compulsory acquisition plan for a public road to resolve access sharing issues with the Bulahdelah Sewerage Treatment Works and the Bulahdelah Waste Facility, as well as meet environmental constraints in choosing the location of the road. The proposed two-way service road described in the EIS integrates with this road, which would be located parallel to and south of the site of the existing waste facility. It would be important to ensure that the interface of these two projects remains smooth to avoid unexpected additional cost or delay to either project.

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Response:

The RTA acknowledges the list of sewerage infrastructure needing to be relocated or adjusted, provided by MCW. Sewerage infrastructure would be relocated or adjusted at the following locations:

- Sewer rising main at the Lee Street/Pacific Highway intersection;
- Gravity sewer at the Lee Street/Pacific Highway intersection;
- Bulahdelah Sewerage Pump Station No.1 would require replacement of pumps if the sewer rising main needs to discharge into the sewer at Lee Street/Pacific Highway intersection at a higher level; and
- Private sewerage pump line from the Golf Club crossing under the existing Pacific Highway and travelling to the Bulahdelah Sewerage Treatment Works.

MCW and Great Lakes Council, in consultation with the RTA, Department of Lands, and DEC have agreed on a proposal for a public road to resolve access sharing issues with the Bulahdelah Sewerage Treatment Works and the Bulahdelah Waste Facility, as well as meet environmental constraints in choosing the location of the road. The proposed two-way service road described in the EIS integrates with this public road, which would be located parallel to and south of the site of the existing waste facility.

The connection between the proposed service road and the Sewage Treatment Works and the Bulahdelah Waste Facility and the public road servicing these facilities would be finalised during detailed design.

4.17 Other

4.17.1 Impacts of RTA projects state wide

In summary, respondents to the EIS and SIS raised the following issues:

- There is concern over the inconsistent application of legislative controls on vegetation clearing for government proposals compared to private landholders. The cumulative clearing of remnant and untouched forest associated with the Pacific Highway and other RTA projects, and the impacts of this on threatened flora and fauna species is concerning.
- There is a level of uncertainty expressed toward the efficacy of the ameliorative measures proposed on various RTA projects, including squirrel glider aerial bridges and koala underpasses as well as the replacement of perfectly good forest with grow-tubes. There appears to be a trend toward preferred routes to pass through habitat instead of cleared land.

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Response:

The RTA is subject to strict legislative controls on vegetation clearing and impacts on threatened species, populations and their habitats. The statutory framework is detailed in Section 2.1 of the Main Volume of the EIS. In addition, the development of the proposed Upgrade is guided by several objectives, which are outlined in Section 1.3. One of these objectives is to achieve environmental sustainability outcomes. How the project objectives are met is outlined in Section 8.2. A detailed ecological assessment is provided in Technical Paper 7, and outlines the ecological impacts of the proposed Upgrade at Bulahdelah. Clearing would be managed under the Flora and Fauna Management Plan using a two-stage clearing process. In addition, the Proposal includes provisions for compensatory habitat and extensive revegetation. The RTA acknowledges there is a cumulative impact on native vegetation resulting from the upgrading of the Pacific Highway. Regional Cumulative Impacts are addressed in Chapter 6 of the EIS Main Volume.

Monitoring of ameliorative measures used at other locations on the Pacific Highway and other roads suggest that Koalas use underpasses to pass safely beneath roads. Aerial bridges are currently being monitored at other locations for use by glider species, including Squirrel Gliders. These measures are being used at Karuah, although it is uncertain how many times they are being crossed. Prior to constructing the glider measures at Bulahdelah, RTA will

assess all available information in assessing the best approach. Planting and/or direct seeding are used to revegetate areas that have been cleared for earthworks. Local native species would be used in revegetation.

The development of the route options and the selection of the preferred route are discussed in section 4.1 of the Main Volume of the Environmental Impact Statement (EIS) and detailed in Technical Paper 3, Volume 2 of the EIS. The selection of the preferred route was based on a balanced assessment of a range of criteria, including the consideration of both land-use and impacts on vegetation/habitats.

5 Correspondence

Since the exhibition of the EIS and SIS, further consultation in the form of letters, liaison and meetings has been undertaken between the RTA, Government Authorities/Agencies and others, regarding matters that have arisen subsequent to exhibition of the EIS and SIS and as a result of submissions received. Additionally, some issues which were addressed in the EIS and SIS have advanced to resolution through this consultation process.

A site inspection and familiarisation was undertaken on 24 January 2005. In attendance at the site inspection were representatives from the DoP, DEC, DEH, RTA and Parsons Brinckerhoff, the consultant engaged to prepare the EIS.

Below is a summary of the correspondence between the RTA and Government Authorities/Agencies.

5.1 Department of Environment and Heritage

On 1 August 2005 changes to the EP&A Act and Regulation commenced operation. These changes introduced an amended environmental assessment and approval regime for major infrastructure and other development declared to be projects under a new Part 3A of the EP&A Act. A Ministerial Order was published in the NSW Government Gazette on 29 July 2005 declaring that activities for which the proponent is also the determining authority and that, in the opinion of the proponent, would require an EIS under Part 5 of the EP&A Act are projects to which Part 3A applies. The RTA notified the Commonwealth Department of Environment and Heritage (DEH) on 3 December 2005, of the changes to the assessment regime for the Proposal, and included correspondence from the NSW Department of Planning, which, in accordance with relevant transitional provisions, indicated an acceptance of the EIS (prepared under Part 5 of the EP&A Act) for the Proposal, as satisfying the requirements of the amended EP&A Act. A copy of the correspondence is provided in **Appendix C** of this Submissions Report.

5.2 Department of Planning

Prior to the August 2005 changes to the EP&A Act and Regulation, the RTA had decided that the project required an EIS within the meaning of Division 4 Part 5 of the EP&A Act. In accordance with transitional provisions in the *Environmental Planning and Assessment (Infrastructure and Other Planning Reform) Regulation 2005*, on 19 September 2005 the RTA submitted an application under Part 3A of the EP&A Act to the Director-General of the Department of Planning (DoP). The RTA requested that the Director-General of DoP adopt the environmental assessment requirements previously issued for the Proposal and accept the EIS and public exhibition for the purposes of Part 3A in accordance with the EP&A (Infrastructure and Planning Reform) Regulation 2005.

On 1 October 2005 the RTA received acceptance of this position from the DoP. The DoP requested that the RTA prepare a Submissions Report, including a Statement of Commitments and a Preferred Project report.

The then Department of Infrastructure, Planning and Natural Resources (DIPNR) provided two letters to the RTA after the exhibition of the EIS seeking clarification of certain matters in the EIS. RTA responses to the issues raised by the then DIPNR were provided to the DoP on the 13th of February 2006. A copy of the correspondence is provided in **Appendix D** of this Submissions Report.

5.3 Karuah Local Aboriginal Land Council

Consultation, including meetings, with the Karuah Local Aboriginal Land Council (KLALC), representatives of the RTA and the DEC continued following the exhibition of the EIS and SIS, in order to clarify the status of two items of Aboriginal significance, a Healing Stream and Guardian Tree.

Representatives of the KLALC have indicated that the impact of the Proposal on Aboriginal cultural heritage values can be mitigated effectively by adopting the management recommendations described in the EIS. Representatives of the KLALC have indicated that there are no Aboriginal sites or places within the construction footprint of the Proposal which are of a significance which would prevent construction.

On 15 November 2005 written advice was received from the KLALC indicating that it was satisfied with the RTA's proposed approach. A number of additional requirements were raised by the KLAC with regard to the management of Aboriginal sites. These additional requirements are included in the Statement of Commitments in Chapter 7 of this Submissions Report. A copy of the written advice is provided in **Appendix C** of this Submissions report.

It should also be noted that the advice from the DEC based on the information provided in the EIS is that both the "Guardian Tree" and the "Healing Stream" are not considered to be Aboriginal objects as defined under the *National Parks and Wildlife Act 1974*.

6 Additional Information and Studies

The following additional studies were undertaken by the RTA following the public display of the EIS and SIS. These studies were prepared in response to issues raised in submissions and to provide further information in relation to the EIS and SIS studies. An overview of each investigation is provided below and the complete reports are provided in the appendices of this Submissions Report. Where relevant, additional mitigation measures were recommended as a result of these investigations and these have been included in Chapter 7 of this Submissions Report.

6.1 Review of Hydrology and Orchid Bridging Options

The Department of Environment and Conservation (DEC), other agencies and interested community members, have raised concerns in relation to:

- The maintenance of soil moisture surrounding the orchids;
- The movement of seed dispersers and fertilising insects; and
- The maintenance of Swamp Mahogany communities due to the disruption of soil moisture regimes.

To better understand the potential impacts of the alignment a detailed review of the distance of surface water flows to individual threatened orchid populations was undertaken by Parsons Brinckerhoff. Due to the sensitive nature of the information contained in the review, a copy is provided in the Confidential Appendix, **Appendix E**.

The outcome of the examination of surface water flow paths was that the alignment would have a significant impact on a population of *Cryptosylis hunteriana* (three plants) and a population of *Rhizanthella slateri* (one plant), or four individual plants. To reduce the soil moisture impacts on the four individual orchids, a range of bridging options was considered. A number of benefits, financial costs and risks have been identified in reviewing the bridging options to mitigate these impacts.

Similar analysis of flow paths and topography with regard to the Swamp Mahogany communities showed that the catchment for the Swamp Mahogany communities would essentially be the same. As a result the Proposal is not expected to have any substantial effect on the moisture regime for the Swamp Mahogany communities located to the west of the alignment and no additional mitigation measures were developed.

The key findings from the review are as follows:

- The majority of surface and sub-surface water flow paths to threatened orchids downhill of the proposed alignment are not affected by the alignment.
- There are two populations of threatened orchid species, or four plants, where flow paths would be significantly affected by the alignment.
- Of the four bridging options considered, only two options appeared to be suitable in that they would have reduced impacts on construction timing and staging, in addition to potentially lower impacts on threatened orchid species. These options would cost between \$1.44M and \$1.66M.

- There is a high risk of damage to at least three of the four orchids due to the very close proximity to the construction works.
- There is a high risk that a bridge in the vicinity of the four individual orchids could generate pedestrian and trail bike traffic that could threaten the survival of an even larger number of orchids than just these plants.
- There are a number of additional benefits from the bridging options including improved passage for most terrestrial fauna species in the area, including the bandicoot (potential seed disperser for *Rhizanthella* sp.) and the ichneumon wasp (fertilising species of *Cryptostylis* sp.), and improved cross-fertilisation, seed dispersal and visual cues.
- The proposed drainage culverts would maintain the water flow to gullies and the local topography would therefore retain the moist conditions that support the Swamp Mahogany population.
- The bandicoot is a mobile species, and it has been stated in the SIS that the species is likely to use the Stuart Street underpass and other drainage structures close to the orchid populations. It is therefore likely that this potential orchid species disperser would continue to range on both sides of the proposed upgrade.

Due to the lack of substantial additional benefits to threatened orchid species that would be derived, the potential risks and the large capital costs involved, the inclusion of an orchid bridge in the concept design is not supported. An extensive range of mitigation measures is included within the Orchid Management Plan currently in preparation (refer to Section 6.2 below).

6.2 Orchid Management Plan

An Orchid Management Plan is currently being prepared by Parsons Brinckerhoff in consultation with DEH and DEC. The Plan examines the residual impacts of the Proposal, following mitigation and design changes, on three species of orchids; the leafless tongue orchid, *Cryptostylis hunteriana*, eastern underground orchid, *Rhizanthella slateri*, and red helmet orchid *Corybas dowlingii*. The Plan would also address in-situ management requirements including pre, during and post construction mitigation measures, the proposed translocation plan, monitoring requirements and contribution to the preparation of Recovery Plans for *Cryptostylis hunteriana* and *Rhizanthella slateri*.

A copy of the table of contents for the Orchid Management Plan is provided in **Appendix F** of this Submissions Report. This Plan would be developed and finalised in consultation with the DEC and DEH.

As a part of the preparation of the Orchid Management Plan, and the ongoing orchid monitoring program, additional surveys were undertaken which are described below in Section 6.2.1.

6.2.1 Additional Orchid Surveys

Additional surveys targeting threatened orchids were undertaken in 2005 by Parsons Brinckerhoff. A complete copy of the survey results can be found in the revised confidential Appendix K found in **Appendix G** including population numbers of *Cryptostylis hunteriana* and *Rhizanthella slateri*. The survey findings indicate that two new populations of *Cryptostylis hunteriana* were found outside the project footprint.

6.3 Addendum to the Biological Impact Assessment

The SIS prepared for the Bulahdelah Bypass identified that the Proposal would be likely to directly affect 1.8 hectares of Wet Meadow vegetation community. This community meets the classification of Freshwater Wetlands on Coastal Floodplains, which is listed as an Endangered Ecological Community (EEC) pursuant to the TSC Act. At the time of writing of the SIS, this community had only a preliminary listing. It was stated in the SIS that the RTA would review the issue following the display of the EIS and SIS subject to the final determination of this EEC.

Additional field survey and a test of significance was carried out for the EEC as required under Section 94 of the TSC Act and Section 5A of the EP&A Act by Parsons Brinckerhoff. The test concluded that the removal of 1.8 hectares (representing 7.8% of the total 23.1 hectare area of community) of poor condition Freshwater Wetlands on Coastal Floodplains subject to ongoing disturbance is unlikely to have a significant impact on the recovery of this community. No mitigation measures would be required additional to those already included in the EIS for minimising the impacts of the Proposal on the Freshwater Wetlands on Coastal Floodplains community.

A copy of the Addendum to the Biological Impact Assessment is provided in **Appendix B**.

6.4 Green-thighed Frog Survey

DEC in its submission to the EIS raised the issue of when and for how long additional surveys would be undertaken for the Green-thighed Frog as stated in the EIS. As a result of this submission, Stage I of Green-thighed Frog surveys would be undertaken in the summer months of 2006 when at least 75-100mm of rainfall has fallen in the study area over a 24 hour period. Further survey times and methodology would be dependent on whether individuals are located during the Stage I survey period.

7 Preferred Project and Statement of Commitments

7.1 Preferred Project

Having considered public submissions for the Bulahdelah Upgrade the RTA have decided that the concept design of the Proposal as described in the EIS and without modification is the Preferred Project. A description of the Preferred Project is provided in Chapter 6 of the Bulahdelah EIS Main Volume.

7.2 Statement of Commitments

Table 7.1 overleaf contains the Statement of Commitments for the Preferred Project for the Bulahdelah Upgrade. Commitments are derived from the EIS, submissions to the EIS, additional studies subsequent to the EIS and the DoP Conditions of Approval Database. The Bulahdelah EIS forms part of the Statement of Commitments for the Preferred Project. Table 7.2 provides definitions for the Statement of Commitments

Note: Commitments marked with a * are additional commitments as result of additional studies and/or commitments made in this submissions report.

Table: 7.1: Statement of Commitments for the Bulahdelah Upgrade

This Statement of Commitments prevails in the event of any inconsistency with the requirements for the Construction and Operation of the Activity arising out of the EIS and Submissions Report.

	Implementation plan and deliverables	Phase
I.	Desired Environmental Outcome – Compliance and auditing – To implement a system for audit and inspection that ensures the successful performance of Environmental Management Plans and this Statement of Commitments.	
I.1	The RTA will: a) carry out the Bulahdelah Upgrade consistent with: i. the procedures, safeguards and mitigation measures identified in the EIS and SIS; ii. additional measures identified in the Submissions Report, and iii. this Statement of Commitments. b) notify in writing the Director General, Planning (D-G), relevant Government Departments and Great Lakes Shire Council, four weeks prior, unless other wise agreed, of the start of the Activity's construction. c) bring to the D-G's attention any matter that may require further assessment by the D-G. d) comply with any requirements of the D-G arising from the D-G's assessment of: i. any reports, plans or correspondence that are submitted to satisfy these Commitments; and ii. the implementation of any actions or measures contained in such reports, plans or correspondence.	All Pre-construction All All
I.2	Environmental Management Representative The RTA will: a) request the D-G's Approval for the appointment of an Environmental Management Representative (EMR), who is independent from the project team, at least eight weeks before Construction commences (or within any other time agreed to by the D-G). In its request the RTA will provide the following information: i. qualifications and experience of the EMR including demonstration of general compliance with relevant Australian Standards for environmental auditors; ii. authority and independence (from the RTA or its contractors) of the EMR including details of the RTA's internal reporting structure; and iii. resourcing of the EMR role.	Pre-construction

	Implementation plan and deliverables	Phase
I.2	b) ensure the EMR is available: i. for sufficient time to undertake the EMR role. This timing shall be agreed between the RTA and the EMR and be advised to the D-G in the request for approval; ii. at any other time requested by the D-G; iii. during any Construction activities identified in the CEMP that require the EMR's attendance; and iv. for the duration of Construction. c) ensure the EMR is authorised to: i. consider and advise the D-G and the RTA on matters specified in these Commitments and compliance with such; ii. determine whether work falls within the definition of Construction where clarification is requested by the RTA; iii. review the CEMP; iv. periodically monitor the RTA's activities to evaluate compliance with the CEMP. Periodic monitoring must involve site inspections of active work sites at least fortnightly; v. provide a written report to the RTA of any non-compliance with the CEMP observed or identified by the EMR. Non compliance must be managed as identified in the CEMP; vi. issue a recommendation to the RTA to stop work immediately if in the view of the EMR an unacceptable impact on the environment is occurring or is likely to occur. The stop work recommendation may be limited to specific activities causing an impact if the EMR can easily identify those activities. The EMR may also recommend that the RTA initiate reasonable actions to avoid or minimise adverse impacts; vii. review corrective and preventative actions to monitor the implementation of recommendations made from audits and site inspections; viii. certify that minor revisions to the CEMP are consistent with the approved CEMP; and ix. provide regular (as agreed with the D-G) reports to the D-G on matters relevant to carrying out the EMR role including notifying the D-G of any stop work recommendations.	All All
I.3	The D-G may at any time immediately revoke the approval of an EMR appointment by providing written notice to the RTA. Interim arrangements for EMR responsibility following the revocation must be agreed in writing between the D-G and the RTA.	All
I.4	The RTA will prepare and submit a Pre-Construction Compliance Report to the D-G at least four weeks before construction commences (or within any other time agreed to by the D-G). The Pre-Construction Compliance Report will include: i. details of how the Commitments required to be addressed before construction were complied with; ii. the time when each relevant Commitment was complied with, including dates of submission of any required reports and/or approval dates; and iii. details of any approvals or licences required to be issued by relevant Government Departments before construction commences.	Pre-construction
I.5	The RTA will notify in writing the D-G, relevant Government Departments and Great Lakes Shire Council, four weeks prior, unless otherwise agreed, of the start of the Activity's Operation.	Pre-construction
I.6	The RTA will prepare and implement an audit and inspection plan. The audit and inspection plan may be incorporated in the CEMP.	All

	Implementation plan and deliverables	Phase
1.7	Construction Compliance Report The RTA will: a) prepare the first Construction Compliance Report to report on the first six months of construction and submit it a maximum of eight weeks after expiry of that period (or at any other time interval agreed to by the D-G). The second, and subsequent, Construction Compliance Reports will be submitted at maximum intervals of six months from the date of submission of the first Construction Compliance Report (or at any other time interval agreed to by the D-G) for the duration of construction. The Construction Compliance Reports will include information on: i. compliance with the CEMP and the Statement of Commitments; ii. compliance with any approvals or licences issued by relevant Government Departments for construction; iii. the implementation and effectiveness of environmental controls. The assessment of effectiveness should be based on a comparison of actual impacts against performance criteria identified in the CEMP; iv. environmental monitoring results, presented as a results summary; v. the number and details of any complaints, including a summary of main areas of complaint, action taken, response given and intended strategies to reduce recurring complaints; vi. details of any review and amendments to the CEMP resulting from construction during the reporting period; and vii. any other matter relating to compliance with the Statement of Commitments or as requested by the D-G. b) provide the D-G, Great Lakes Shire Council and any other Government Department nominated by the D-G with a copy of the Construction Compliance Reports. c) make the Construction Compliance Reports publicly available.	Construction Construction Construction
1.8	The RTA will submit an Environmental Impact Audit Report - Construction to the D-G a maximum three months after construction is complete (or at any other time interval agreed to by the D-G). This report will be submitted to other relevant Government Departments upon the request of the D-G. The Environmental Impact Audit Report – Construction will: i. identify the major environmental controls used during construction and assess their effectiveness; ii. summarise the main environmental management plans and processes implemented during construction and assess their effectiveness; iii. identify any innovations in construction methodology used to improve environmental management; and iv. discuss the lessons learnt during construction, including recommendations for future Activities.	Construction / Operation
1.9	The RTA will submit a Pre-Operation Compliance Report to the D-G at least four weeks before operation commences (or within any other time agreed to by the D-G). The Pre-Operation Compliance Report includes: i. details of how the Commitments required to be addressed before operation were complied with; ii. the time when each relevant Commitment was complied with, including dates of submission of any required reports and/or approval dates; and iii. details of any approvals or licences issued by relevant Government Departments for the Activity's Operation.	Construction

	Implementation plan and deliverables	Phase
1.10	The RTA will submit an Environmental Impact Audit Report -Operations to the D-G a maximum 24 months after the Activity begins operation. The Environmental Impact Audit Report - Operation will be submitted to other relevant Government Departments upon the request of the D-G. The Environmental Impact Audit Report - Operation will: i. be certified by an independent person at the RTA's expense. The certifier's details will be provided to the D-G before the Environmental Impact Audit Report – Operation is prepared; ii. compare the operation impact predictions made in the EIS, Submissions Report and any supplementary studies with the actual impacts; iii. assess the effectiveness of implemented mitigation measures and safeguards; iv. assess compliance with the systems for operation maintenance and monitoring; v. discuss the results of consultation with the local community particularly any feedback or complaints; and vi. be made Publicly Available.	Operation
2.	Desired Environmental Outcome – Environmental Management: To manage the potential environmental impacts of the Project in order to meet the requirements identified in the EIS, SIS and Submissions Report.	
2.1	Construction Environmental Management Plan (CEMP) The RTA will: a) prepare a Construction Environmental Management Plan (CEMP) consistent with the DoP Guidelines for CEMP preparation. b) ensure that the mitigation measures identified in the EIS, Submissions Report and this Statement of Commitments are incorporated into the CEMP. The CEMP will: i. state how the mitigation measures identified in Table 7-1 of this Submissions Report will be implemented (this table); ii. include a construction program, identifying construction activities and their location and timing; iii. cover any relevant environmental elements identified by the RTA, or its contractor, from their environmental due diligence investigations; iv. contain the Construction Sub Plans required by these Commitments; v. be prepared following consultation with relevant Government Departments and Great Lakes Shire Council; vi. be publicly available; vii. include a community consultation and notification strategy (including local community, Relevant Government Departments, Great Lakes Shire Council), and complaints management system; viii. include environmental management details such as: - identification of statutory obligations which the RTA is required to fulfil during construction, including all approvals and licences; - an environmental management structure indicating the responsibility, authority and accountability for personnel relevant to the CEMP; - details of the construction personnel induction and training program; - emergency response procedures; ix. include implementation details such as: - identification of relevant environmental elements; - measures to avoid and/or control environmental impacts; - the tools to be used to implement the CEMP such as plans, schedules and work instructions; x. include monitoring and review details such as: - performance criteria; - performance monitoring methods; - auditing and corrective actions procedures; and - CEMP review procedures.	Pre-construction Pre-construction

	Implementation plan and deliverables	Phase
3.2	b) ensure the community liaison group includes: a. the EMR, b. representatives from the RTA and the head contractor; c. representatives from the Great Lakes Shire Council; and d. representatives identified and selected from relevant community and business groups and individual members of the community adjoining the Activity. c) provide a chairperson for the community liaison group. The chairperson will be independent of the RTA and may be elected from the community liaison group membership. d) Provide meeting facilities for the community liaison group and take notes of the community liaison group meetings. These meeting notes will be available to the community liaison group members within 14 days of the meeting and should be endorsed by the Chairperson. e) provide access for site inspections by the community liaison group . f) provide the community liaison group with regular information on the progress of Construction and related environmental performance. g) nominate two representatives to attend community liaison group meetings. h) maintain community liaison group for the duration of Construction unless otherwise approved by the D-G. i) where reasonably required by the Chairperson: i. arrange consultant(s) to explain technical information to the community liaison group ; and ii. invite representatives from relevant Government Departments or other individuals to attend the community liaison group meetings.	Pre-construction / Construction Pre-construction / Construction Pre-construction / Construction Pre-construction / Construction Pre-construction / Construction Construction Pre-construction / Construction
3.3	The RTA will: a) ensure that the local community and businesses are advised of construction activities that could cause disruption. Methods to disseminate this information will be identified in the CEMP. Information to be provided will include: i. details of any traffic disruptions and controls; ii. construction of temporary detours; and iii. work approved to be undertaken outside standard construction hours, in particular noisy works, before such works are undertaken. b) establish an Activity internet site before construction commences and maintain the internet site until construction ends. This internet site will contain: i. periodic updates of work progress, consultation activities and planned work schedules. The site will indicate the date of the last update and the frequency of the internet site updates; ii. a description of relevant approval Authorities and their areas of responsibility; iii. a list of reports and plans that are publicly available under this Approval and details of how these can be accessed; iv. contact names and phone numbers of relevant communications staff; v. the 24 hour toll-free complaints contact telephone number; and vi. updates of work progress, construction activities and planned work schedules where significant changes in noise or traffic impacts are expected.	Construction Pre-construction

	Implementation plan and deliverables	Phase
3.3	c) prepare a Construction Complaints Management System as part of the Community Involvement Plan, before construction commences and maintain the system for the duration of construction. The Construction Complaints Management System will be consistent with AS 4269 "Complaints Handling" and include: i. a 24 hour, toll free telephone number listed with a telephone company and advertised; ii. a system to receive, record, track and respond to complaints within a specified timeframe. When a complaint cannot be responded to immediately, a follow-up verbal response on what action is proposed will be provided to the complainant within two hours during night-time works and 24 hours at other times; iii. a process for the provision of a written response to the complainant within 10 days, if the complaint cannot be resolved by the initial or follow-up verbal response; and iv. a mediation system for complaints unable to be resolved. d) include information on all complaints received, including the means by which they were addressed and whether resolution was reached with or without mediation, in the Construction Compliance Reports. e) establish display centre(s), staffed and maintained as identified in the Community Involvement Plan. Where required, the display centre(s) may: i. provide facilities to enable members of the community to obtain information about the Activity; ii. be open during times identified in the Community Involvement Plan and advised to the community; iii. contain information (written and/or graphics) covering at least: - construction activities and programs including temporary works that will affect Sensitive Receivers, commercial and industrial land uses, pedestrians and public transport users; - overall architectural and landscape designs with graphics, such as sections, sketches, perspective views etc, for key elements; iv. provide a computer with internet access to the Activity's internet site; and v. provide a phone line that allows the community to contact the Proponent. f) advertise in relevant newspapers before construction commences, and then at maximum three monthly intervals, the: i. nature of the works proposed for the next three months; ii. areas in which these works are proposed; iii. construction hours; and iv. a contact telephone number.	Pre-construction / Construction Pre-construction Pre-construction / Construction All
3.4	The RTA will consult property owners about implementing mitigation measures that affect their property. Mitigation measures will be implemented according to a program derived from that consultation and will be consistent with these Statement of Commitments.	All
4.	Desired Environmental Outcome –Traffic and Access: To maintain access to property and maintain traffic movements on the road network through all phases of the Activity.	
4.1	The RTA will: a) prepare pre-construction road dilapidation reports for all roads likely to be used by construction traffic. These reports will be prepared before construction commences. b) prepare post construction road dilapidation reports for the roads assessed prior to construction following the completion of construction by the RTA. Any damage resulting from construction, except that resulting from normal wear and tear, will be repaired at the RTA's cost. Alternatively the RTA may negotiate an alternative arrangement for road damage with the relevant roads authority. c) provide copies of the dilapidation reports to the relevant roads authority.	Pre-construction Operation All

	Implementation plan and deliverables	Phase
4.2	The RTA will prepare a Construction Traffic Management Sub Plan as part of the CEMP. The Sub Plan will include: i. the requirements included in Appendix F of the Bulahdelah EIS – Main Volume, Table FI, pF.17; ii. identification of all public roads to be used by construction traffic, in particular roads proposed to transport large quantities of construction materials. The expected timing and duration of road usage will be stated; iii. management methods to ensure construction traffic uses identified roads; iv. identification of all public roads that may be partially or completely closed during construction and the expected timing and duration of these closures. Consideration will be given to programming construction works to minimise road closures during peak hours and/or holiday periods; v. impacts on existing traffic (including pedestrians, vehicles, cyclists and disabled persons); vi. temporary traffic arrangements including property access; vii. access to construction sites including entry and exit locations and measures to prevent construction vehicles queuing on public roads; viii. a response plan for any construction traffic incident; and ix. monitoring, review and amendment mechanisms.	Pre-construction
4.3	The RTA will implement the Construction Traffic Management Sub Plan.	Construction
4.4	The RTA will: a) ensure that access to properties is maintained during construction and, where necessary and feasible, provide temporary alternative access. b) ensure that where any legal property access is permanently affected by the Activity, that alternative access to an equivalent standard to and from a public road is provided where a property has no other legal means of access and where such alternative access is feasible and practical. Alternatively, where alternative access arrangements are not feasible or practical and a property is left with no access to a public road, ensure that negotiations are undertaken with the relevant property owner for the acquisition of the property in accordance with the provisions of the <i>Land Acquisition (Just Terms Compensation) Act 1991</i>.	Construction Construction
4.5	The RTA will undertake the traffic monitoring required in Appendix F of the Bulahdelah EIS – Main Volume, Table FI, pF.17.	Operation

	Implementation plan and deliverables	Phase
5.	Desired Environmental Outcome – Construction Noise and Vibration: To manage Noise and Vibration generated during the construction and minimise the affects of construction noise and vibration on the community.	
5.1	The RTA will: a) prepare a Construction Noise and Vibration Management (NVM) Sub Plan. The Sub Plan will be prepared in consultation with the Great Lakes Shire Council and the community liaison group and assign responsibility and timing of mitigation and monitoring measures. The Sub Plan will include: i. Noise and Vibration Management measures listed in Appendix F of the Bulahdelah EIS – Main Volume, Table F.1 p F.3-F.5; ii. an education program for construction personnel about noise minimisation; iii. identification of each construction activity, including Ancillary Facilities, and their associated noise sources; iv. identification of all potentially affected Sensitive Receivers; v. the appropriate construction vibration criteria identified within these Statement of Commitments; vi. determination of appropriate noise and vibration objectives for each identified Sensitive Receiver; vii. noise and vibration monitoring, reporting and response procedures; viii. assessment of potential noise and vibration from each construction activity including noise from construction vehicles and any traffic diversions; ix. a description of management methods and procedures and specific noise mitigation treatments that will be implemented to control noise and vibration during construction; x. justification for any activities outside the construction hours specified in the Statement of Commitments This includes identifying areas where construction noise will not be audible at any Sensitive Receiver; xi. procedures for notifying residents of construction activities that are likely to affect their noise and vibration amenity; and xii. contingency plans to be implemented in the event of non-compliances and/or noise complaints. b) seek approval from D-G for the Construction NVM sub plan as part of the CEMP.	Pre- construction Pre-construction
5.2	The RTA will undertake pre – construction noise monitoring as required by the Noise and Vibration Management measures listed in Appendix F of the Bulahdelah EIS – Main Volume, pF.3.	Pre-construction
5.3	The RTA will: a) implement measures as identified in the NVM Sub-Plan to reduce noise impact of construction activities including blasting to nearby residences. b) ensure that public address systems used at any construction site are not used outside the normal construction hours listed in the EIS Table F.1pF.3 unless otherwise approved through the NVM Sub Plan. Public address systems will be designed to minimise noise spillage off-site. c) schedule rock breaking, rock hammering, sheet piling, pile driving and any similar activity only between the following hours unless otherwise approved in the NVM Sub Plan: i. 9 am to 12 pm and 2 pm to 5 pm, Monday to Friday; and ii. 9 am to 12 pm, Saturday. d) ensure that wherever practical, and where Sensitive Receivers may be affected, driven piles are not used. If driven piles are required they will only be installed where approved in the NVM Sub Plan.	Construction Construction Construction Construction

	Implementation plan and deliverables	Phase
5.3	e) limit vibration caused by construction and received at any Structure outside the Activity to the following unless, otherwise approved in the NVM Sub Plan: i. (German Standard DIN 4150 Part 3 Structural Vibration in Buildings. Effects on Structures; and ii. the evaluation criteria presented in British Standard BS 6472 - Guide to Evaluate Human Exposure to Vibration in Buildings (1Hz to 80 Hz) for low probability of adverse comment. f) undertake blasting between the hours of 9:00 am and 3:00 pm, Monday to Friday, and 9:00 am to 12:00 pm on Saturday, unless otherwise approved in the NVM Sub Plan. g) ensure that the vibration level due to blasting activities will meet the requirements of any relevant DEC Licence. The guideline “Technical Basis for Guidelines to Minimise Annoyance due to Blasting Overpressure and Ground Vibration” prepared by the Australian and New Zealand Environment and Conservation Council (ANZECC) would generally apply to blasting. h) undertake blasting trials if blasting is to be used. Results from the trials will be used to determine site-specific blast designs that will enable the performance criteria specified in the Construction NVM Sub Plan to be satisfied. i) make all reasonable attempts to contact sensitive receivers located within 500 metres of a blast location. The contact will be made at least 48 hours before a blast and advice given to the receiver will include a schedule of blast time(s) and a telephone number and contact name. j) undertake the noise monitoring requirements as per the Noise and Vibration Management measures listed in Appendix F of the Bulahdelah EIS – Main Volume, pF.5.	Construction Construction Construction Construction Construction Construction
6.	Desired Environmental Outcome – Operational Noise: The RTA will design and construct operational noise treatments on the Bulahdelah Upgrade to achieve the goals established in the NSW Government’s “Environmental Criteria for Road Traffic Noise”.	
6.1	The RTA will: a) prepare an Operation Noise Management Report detailing its investigation of “Reasonable and Feasible” operation noise mitigation methods. The RTA will seek the approval of the D-G for the Operation Noise Management Report at a time agreed to by the D-G. The Operation Noise Management Report will: i. consider the NSW Government’s “Environmental Criteria for Road Traffic Noise” (ECRTN) and the RTA’s “Environmental Noise Management Manual” (ENMM); ii. identify the operation noise criteria; iii. identify Sensitive Receivers; iv. predict noise levels at all Sensitive Receivers; v. detail “Reasonable and Feasible” noise mitigation measures, physical and managerial. An analysis for the entire Activity will be undertaken in accordance with Practice Note IV of the RTA’s “Environmental Noise Management Manual”; vi. consider urban design issues relating to noise control measures; vii. identify which noise mitigation measures will be implemented, including their location, type and when they would be implemented; and viii. detail noise monitoring, reporting and complaint response procedures. b) implement the requirements of the Operational Noise Management Report.	Construction Construction / Operation

	Implementation plan and deliverables	Phase
6.2	The RTA will assess the adequacy of the implemented traffic noise mitigation measures one year after opening the Activity. Should the assessment indicate traffic noise levels exceeding those predicted in the Operation Noise Management Report, the RTA will i. advise the D-G; and ii. investigate and implement further “Reasonable and Feasible” mitigation measures in accordance with the NSW Government’s ECRTN and RTA’s ENMM. The selection of these measures will be undertaken in consultation with affected property owners and be consistent with the Operation Noise Management Report.	Operation
6.3	The RTA will undertake the monitoring of operation noise in accordance with Practice Note VIII of the RTA’s ENMM	Operation
7.	Desired Environmental Outcome – Flora and Fauna: To manage adverse impacts on native vegetation, fauna and their habitats, and threatened flora and fauna in accordance with the strategies contained in the EIS.	
7.1	The RTA will: a) prepare a Flora and Fauna Management Sub Plan. The Sub Plan will be prepared in consultation with relevant Government Departments and Great Lakes Shire Council and include: i. Flora and Fauna measures listed in Appendix F of the Bulahdelah EIS – Main Volume, Table F.1 p F.11-F13. ii. plans showing: - terrestrial vegetation communities; important flora and fauna habitat areas; locations where threatened species, populations or ecological communities were recorded; and areas to be cleared. The plans will also identify vegetation adjoining the Activity where this contains important habitat areas and/or threatened species, populations or ecological communities; - aquatic vegetation communities; important habitat areas; locations where threatened species, populations or ecological communities were recorded; and areas to be cleared. The plans will also identify vegetation adjoining the Activity where this contains important habitat areas and/or threatened species, populations or ecological communities; iii. methods to manage impacts on flora and fauna species (terrestrial and aquatic) and their habitat which may be directly or indirectly affected by the Activity. These will include: - procedures for vegetation clearing, soil management and managing other habitat damage (terrestrial and aquatic) during construction; - methods to protect vegetation both retained within, and also adjoining, the Activity from damage during construction; - a habitat tree management program including fauna recovery procedures and habitat maintenance (e.g. relocating hollows or installing nesting boxes); - methods to minimise damage to aquatic habitats; - where possible, and where consistent with DEC or DPI Fisheries requirements, strategies for re-using in rehabilitation works individuals of any threatened plant species that would be otherwise be destroyed by the Activity; - performance criteria against which to measure the success of the methods; iv. rehabilitation details including: - identification of locally native species to be used in rehabilitation and landscaping works, including flora species suitable as a food resource for threatened fauna species; - methods to remediate affected aquatic habitats or fish passages; - the source of all seed or tube stock to be used in rehabilitation and landscaping works including the identification of seed sources within the Activity. Seed of locally native species within the Activity should be collected before construction commences to provide seed stock for revegetation; - methods to re-use topsoil (and where relevant subsoils) and cleared vegetation; - measures for the management and maintenance of all preserved, planted and rehabilitated vegetation (including aquatic vegetation);	Pre-construction

	Implementation plan and deliverables	Phase
7.1	v. a Weed Management Strategy including: - identification of weeds within the Activity and adjoining areas; - weed eradication methods and protocols for the use of herbicides; - methods to treat and re-use weed infested topsoil; - strategies to control the spread of weeds during construction; vi. a program for reporting on the effectiveness of terrestrial and aquatic flora and fauna management measures against the identified performance criteria. Management methods will be reviewed where found to be ineffective. b) * develop an Orchid Management and Translocation Plan. The Plan will be prepared in consultation with the DEC, DEH and DPI (Forests). Issues that will be considered during the preparation of the Plan will include: i. Research into orchid pollination, seed collection, propagation and translocation; ii. Orchid translocation trials based on research outcomes; iii. Additional targeted orchid habitat survey in the Bulahdelah area; and iv. Consideration of options to protect suitable existing orchid habitat in the Bulahdelah area. c) * form an inter-agency advisory group to co-ordinate communication between Agencies involved in orchid management and translocation issues on this project. The inter-agency advisory group will include representatives from the RTA, DEC, DEH and DPI (Forests); d) seek approval from the D-G for the Flora and Fauna Management sub plan. e) * seek approval from the D-G for the Orchid Management and Translocation Plan.	Pre-construction
	f) * undertake Green-thighed Frog surveys in the summer months of 2006 when at least 75-100mm of rainfall has fallen in the study area over a 24 hour period. The results of this survey will be forwarded to the DEC for their information.	Pre-construction
	g) undertake the design and construction of bridges and culverts in consultation with the DEC and DPI Fisheries. The RTA will ensure the design and construction of bridges and culverts are consistent with DPI Fisheries Guidelines.	Pre-construction
7.2	The RTA will:	
	a) implement all construction requirements of the Flora and Fauna Management Sub Plan , including the requirements of the Orchid Management and Translocation Plan .	Construction
	b) establish contractual systems for the Construction Contractor to conduct inspections and monitor compliance with plan requirements.	Pre-construction
	c) conduct inspections as detailed in Appendix F of the Bulahdelah EIS – Main Volume, Table F.1 p F.13.	Construction
	d) undertake ongoing monitoring and additional studies in accordance with the Orchid Management and Translocation Plan	Construction

	Implementation plan and deliverables	Phase
7.3	The RTA will: a) implement post construction requirements of the Flora and Fauna Management Sub Plan, including the requirements of the Orchid Management and Translocation Plan. b) implement operation phase requirements included in Appendix F of the Bulahdelah EIS – Main Volume, Table F.1 p F.11 c) undertake ongoing monitoring and additional studies in accordance with the Orchid Management and Translocation Plan.	Operation Operation Operation
8.	Desired Environmental Outcome – Aboriginal Heritage – To manage adverse impacts on indigenous heritage in accordance with the strategies contained in the EIS.	
8.1	The RTA will: a) prepare an Indigenous Heritage Management Sub Plan as part of the CEMP. The RTA will consult with all relevant Aboriginal groups and the DEC when preparing the Sub Plan. The Sub Plan will include: i. Aboriginal heritage measures listed in Appendix F of the Bulahdelah EIS – Main Volume, Table F.1 p F.16 ii. details of the archaeological investigations to be undertaken and any associated licences or approvals required; iii. procedures to be implemented if previously unidentified Aboriginal objects are discovered during construction; and iv. an education program for construction personnel on their obligations for Aboriginal cultural materials. b) *ensure that the culvert at the healing stream is designed to allow for the retention of as much of the natural stream bed as possible.	Pre-construction Pre-construction
8.2	The RTA will: a) implement the Indigenous Heritage Management Sub Plan. b) should it become aware of any unexpected Indigenous Heritage object(s) during the course of construction, immediately cease all work likely to affect the object(s) and inform the DEC in accordance with the National Parks and Wildlife Act 1974.	Construction Construction
9.	Desired Environmental Outcome – Non-Indigenous Heritage – To manage adverse impacts on heritage items and structures in accordance with the strategies contained in the EIS.	
9.1	The RTA will: a) prepare a Non-Indigenous Heritage Management Sub Plan as part of the CEMP. The Sub Plan will be prepared in consultation with the Heritage Office and Great Lakes Shire Council and include: i. “Historic Heritage” measures listed in Appendix F of the Bulahdelah EIS – Main Volume, Table F.1 p F.16. ii. details of any investigations to be undertaken and any approvals required; iii. procedures to be implemented if previously unidentified Non-Indigenous relics are discovered during construction; and iv. an education program for construction personnel on their obligations for Non-Indigenous relics.	Pre-construction
9.2	The RTA will: a) implement the Non-Indigenous Heritage Management Sub Plan.	Construction

	Implementation plan and deliverables	Phase
	b) should it become aware of any unexpected Non-Indigenous Heritage object(s) during the course of construction, immediately cease all work likely to affect the object(s) and inform the Heritage Council in accordance with the Heritage Act 1977.	Construction
9.3	The RTA will implement “Historic Heritage” measures listed in Appendix F of the Bulahdelah EIS – Main Volume, Table F.1 p F.16.	Operation
10.	Desired Environmental Outcome – Soil and Water Management – To manage soil and water impacts to achieve the objectives of Landcom’s guideline “Managing Urban Stormwater - Soils and Construction” (2004), the Acid Sulfate Soils Manual (1998), the RTA’s Code of Practice for Water Management (1999).	
10.1	The RTA will prepare a Soil and Water Management (S&WM) Sub Plan in consultation with relevant Government Departments and Great Lakes Shire Council as part of the CEMP. The Sub Plan will: i. Include the hydrology, water quality and soil measures listed in Appendix F of the Bulahdelah EIS – Main Volume, Table F.1 p F.8-F.11. ii. where relevant, be consistent with the Landcom’s guideline “Managing Urban Stormwater – Soils and Construction”, the RTA’s “Guidelines for the Control of Erosion and Sedimentation in Roadworks” and the DIPNR “Constructed Wetlands Manual”; iii. identify the construction activities that could cause soil erosion or discharge sediment or water pollutants from the site; iv. describe management methods to minimise soil erosion or discharge of sediment or water pollutants from the site including a strategy to minimise the area of bare surfaces during construction; v. describe the location and capacity of erosion and sediment control measures; vi. identify the timing and conditions under which construction stage controls will be decommissioned; vii. include contingency plans to be implemented for events such as fuel spills; and viii. identify how the effectiveness of the sediment and erosion control system will be monitored, reviewed and updated.	Pre-construction
10.2	The RTA will prepare an Acid Sulfate Soil Management Sub Plan in consultation with relevant Government Departments as part of the CEMP. The Sub Plan will: i. be consistent with the “Acid Sulfate Soils Manual” (Acid Sulfate Soil Management Advisory Committee, 1998) or update; ii. include a contingency plan to deal with the unexpected discovery of actual or potential acid sulphate soils; and iii. include a water quality monitoring program.	Pre-construction
10.3	The RTA will prepare a Spoil and Fill Management Sub Plan as part of the CEMP. The Sub Plan will include: i. the locations of major (defined as a volume greater than 500 cubic metres) spoil stockpiles; ii. the source of imported fill material and where it will be stockpiled and used; and iii. methods to re-use or dispose excess or unsuitable spoil material including estimated volumes and disposal sites.	Pre-construction
10.4	The RTA will investigate the potential for changes in the groundwater table before any major earthworks (defined as a cut or fill area with depth or height exceeding five metres). Where a potential for change is identified the RTA will: i. assess the significance of the change and any resultant effects within and outside the road reserve; and ii. where necessary, design and implement measures to manage the changes. Management measures will be determined in consultation with the regional office of DNR	Pre-construction
10.5	The RTA will implement water monitoring program before Construction in accordance with the Bulahdelah EIS Main Volume EIS Appendix F pF.8.	Pre-construction

	Implementation plan and deliverables	Phase
10.6	The RTA will ensure all operation stage controls for stormwater drainage and water pollution are located, designed, constructed, operated and maintained to meet the requirements of the RTA's "Code of Practice for Water Management – Road Development and Management". These controls will be designed in consultation with relevant Government Departments and Great Lakes Shire Council.	All
10.7	The RTA will: a) implement the S&WM sub plan, the Acid Sulfate Soil Management Sub Plan and the Spoil and Fill Management Sub Plan. b) consult an appropriately qualified soil conservationist according to a schedule identified in the S&WM Sub Plan to: - undertake inspections of temporary and permanent erosion and sedimentation control devices; - ensure that the most appropriate controls are being implemented; - check that controls are being maintained in an efficient condition; and - check that controls meet the requirements of any relevant approval and/or licence condition. c) implement a monitoring program during construction in accordance with the Bulahdelah EIS Main Volume EIS Appendix F pF.8. d) report the results of inspections undertaken by the soil conservationist and any follow-up actions in the Construction Compliance Reports required by this Statement of Commitments	Construction Construction Construction Construction
10.8	The RTA will: a) implement operational water management controls as listed in Appendix F of the Bulahdelah EIS – Main Volume, Table F.1 p F.8. b) implement a maintenance and inspection program for operational controls as listed in Appendix F of the Bulahdelah EIS – Main Volume, Table F.1 p F.8-F.11.	Operation Operation
11.	Desired Environmental Outcome – Air Quality – To manage adverse air quality impacts on the community to meet air quality targets identified in the EIS.	
11.1	The RTA will prepare an Air Quality Management Sub Plan as part of the CEMP. The Sub Plan will identify and include: i. the air quality measures listed in Appendix F of the Bulahdelah EIS – Main Volume, Table F.1 p F.5. ii. potential sources of dust; iii. dust management objectives consistent with DEC guidelines; iv. a monitoring program to assess compliance with the identified objectives. Monitoring for dust deposition and particulate concentration will be undertaken according to the DEC Guideline "Approved Methods for Sampling and Analysis of Air Pollutants in New South Wales"; v. mitigation measures to be implemented, including measures during weather conditions where high level dust episodes are probable (such as strong winds in dry weather); and vi. a progressive rehabilitation strategy for exposed surfaces with the aim of minimising exposed surfaces.	Pre-construction

	Implementation plan and deliverables	Phase
11.2	The RTA will: a) implement the Air Quality Management Sub Plan .	Construction
	b) ensure that all plant and equipment used in connection with the Activity are: i. maintained in a proper and efficient condition; and ii. operated in a proper and efficient manner.	Construction
	c) ensure that construction vehicles using public roads are maintained to prevent any loss of load, whether dust, liquid or soils. Facilities will be provided at exit points of all construction sites/compounds to minimise tracking mud, dirt or other material onto a public road or footpath. In the event of any spillage, the RTA will remove the spilled material as soon as practicable within the working day of the spillage.	Construction
	d) implement a dust monitoring program in accordance with the Bulahdelah EIS Main Volume EIS Appendix F pF.5.	Construction
12.	Desired Environmental Outcome – Green house gases and energy – To manage energy consumption and greenhouse gas generation during construction in accordance with the strategies contained in the EIS.	
12.1	The RTA will: a) promote the reduction of greenhouse gases by adopting energy efficient work practices including: i. developing and implementing procedures to minimise energy use; and ii. conducting awareness programs for all site personnel regarding energy conservation methods.	Pre-construction
	b) conduct energy audits during the Activity to identify and address energy waste.	Construction
12.2	The RTA will: a) use electrical energy derived from a renewable energy source accredited by the Sustainable Energy Development Authority (SEDA) for the supply of at least 50% of the on-site electrical energy requirements for the Activity's construction site compound.	Construction
	b) report on the power consumption (green power or other) in the Construction Compliance Reports.	Construction

	Implementation plan and deliverables	Phase
16.3	Flooding issues The RTA will: a) undertaken an independent review of the detailed design to ensure the flooding requirements in the Bulahdelah EIS - Main Volume EIS Volume, Technical Paper 8 and this statement of commitments are complied with. b) endeavour to resolve amicably any dispute between itself and any landowner about alterations to flooding characteristics caused by the Activity. If the parties cannot reach a mutually satisfactory resolution then the dispute resolution requirements of this Statement of Commitments (the complaints management system) will apply.	Pre-construction All
16.4	Property impacts The RTA will: a) undertake a risk assessment before construction commences to determine which structures or properties may be affected by construction activities and therefore need to be inspected. The risk assessment will be undertaken by geotechnical and construction engineering experts with appropriate registration on the National Professional Engineers Register. b) conduct inspections of structures on all properties, subject to landowner agreement, within: i. 200 metres of blasting; ii. 50 metres of construction activities that generate vibration impacts; and iii. any other locations identified by the Proponent in the risk assessment. c) undertake the property inspections consistent with AS 4349.1-1995 Inspection of buildings - Property inspections - Residential buildings d) advise the owners of all properties on which property inspections are conducted at least two weeks before the inspection of its scope and methodology and of the process for making a property damage claim. e) provide the owner of each property inspected with a copy of the property inspection report at least three weeks before construction commences. f) maintain a register of all properties inspected indicating whether the owner accepted or refused the property inspection offer. A copy of the register will be provided to the D-G upon request g) where liable, rectify any property damage caused directly or indirectly (for example from vibration or from groundwater change) by the Activity's construction or operation at no cost to the property owner(s). Alternatively the RTA may negotiate compensation for the property damage with the property owner. h) reinstate a water supply of equivalent quality and quantity where a licensed bore, dam or other property water supply is adversely affected by the Activity the RTA. Alternatively the RTA may negotiate compensation for the loss with the landowner.	Pre-construction Pre-construction Pre-construction Pre-construction Pre-construction All Construction / Operation Construction / Operation

Table 7.2: Definitions for the Statement of Commitments

Term	Definition
Activity	The activity described in Chapter 5 of the Bulahdelah EIS Main Volume.
Ancillary Facility	Temporary facility for Construction that does not form part of the Activity. Examples are an office and amenities compound, batch plant (concrete or bitumen), materials storage compound
Construction	Includes all work in respect of the Activity other than survey, acquisitions, fencing, investigative drilling or excavation, building/road dilapidation surveys, minor clearing (except where threatened species, populations or ecological communities would be affected), establishing site compounds (in locations meeting the criteria of the Conditions), or other activities determined by the EMR to have minimal environmental impact (e.g. minor access roads, minor adjustments to services/utilities, etc.).
Department, the	Department of Planning.
D-G	Director-General of the Department (or delegate).
Director-General's Agreement	A written advice from the Director-General (or delegate).
Director-General's Approval	A written approval from the Director-General (or delegate). Where the Director-General's Approval is required under a Condition the Director-General will endeavour to provide a response within one month of receiving an approval request. The Director-General may ask for additional information if the approval request is considered incomplete. When further information is requested the time taken for the Proponent to respond in writing will be added to the one month period.
Director-General's Report	The report provided to the Minister by the Director-General of the Department under section 75I of the EP&A Act.
EIS	Means the <i>Bulahdelah Upgrading the Pacific Highway Environmental Impact Statement Main Volume</i> (Parsons Brinckerhoff 2004).
Minister, the	Minister for Planning.
Operation	Means the Operation of the Activity, but does not include commissioning trials of equipment or temporary use of parts of the Activity during Construction.
Proponent	Means RTA
Publicly Available	Available for inspection by a member of the general public (for example available on an internet site or at a display centre).

Term	Definition
Reasonable and Feasible	Consideration of best practice taking into account the benefit of proposed measures and their technological and associated operational application in the NSW and Australian context. Feasible relates to engineering considerations and what is practical to build. Reasonable relates to the application of judgement in arriving at a decision, taking into account: mitigation benefits, cost of mitigation versus benefits provided, community views and nature and extent of potential improvements.
Relevant Government Departments	Generally means one or more of the, DoP, DEC (including EPA and NPWS functions), Department of Primary Industries (including NSW Fisheries), Commonwealth DEH.
Submissions Report	Means the <i>Bulahdelah Submissions Report / Supplement to the Draft EIS</i> (RTA 2005).
River	Has the meaning given under the NSW <i>Water Management Act 2002</i> . In summary, this is “any watercourse, whether perennial or intermittent and whether comprising a natural channel or a natural channel artificially improved”.
Sensitive Receiver	Residence, education institution (e.g. school, TAFE college), health care facility (e.g. nursing home, hospital) and religious facility (e.g. church).
Stages	Stages refers to the: • division of an Activity into multiple contract packages; and/or • Construction or Operation of an Activity in discrete sections.
Structure	Residence, farm shed or other building.

8 Conclusion

This Submissions Report demonstrates that:

- Statutory obligations have been met;
- The EIS and SIS have been considered;
- All issues arising from the submissions and additional correspondence since the EIS and SIS exhibition have been considered and written responses to the issues have been provided;
- In responding to these issues and to other correspondence, additional studies have been undertaken which include consideration of likely impacts and the measures which might be used to mitigate these impacts. Additional and modified mitigation measures have been proposed in light of the submissions received and the additional studies;
- Having considered the submissions received, the RTA is satisfied that the Proposal, as described in the EIS, should proceed with no modifications as discussed in the Preferred Project Report and that the environmental management measures in Statement of Commitments be implemented.

In consideration of the above, the RTA proposes to seek approval of the Minister for Planning under Part 3A of the EP&A Act for the Proposal as described in Chapter 7 of this Submissions Report. Additionally, if the Proposal receives the necessary approvals under NSW legislation, the RTA would seek approval of the Commonwealth Minister for Environment and Heritage under the EPBC Act for the Proposal as described in Chapter 7 of this Submissions Report.

9 References

Australian Museum Business Services 2001 *An Investigation of the Use of Road Overpass Structures by Arboreal Marsupials*, report prepared for the Roads and Traffic Authority by Australian Museum Business Services, East Sydney, NSW.

Bali R. 2000 *Discussion Paper – Compensating for Edge Effects*. Report prepared for Roads and Traffic Authority, Sydney, NSW.

Bali, R. 2005 *Discussion Paper - Compensating For Edge Effects*. Report prepared for the Roads and Traffic Authority.

Forman R.T.T., Sperling D, Bissonette J.A., Clevenger A.P., Cutshall C.D., Dale V.H., Fahrig L., France R., Goldman C.R., Heanue K., Jones J.A., Swanson F.J., Turrentine T. & Winter T.C. 2003 *Road Ecology: Science and Solutions*. Island Press, Washington.

Land for Wildlife 1991 *Nest boxes for wildlife*. Land for Wildlife Victoria note No. 14.

Little, S.J., Harcourt, R.G. and Clevenger, A.P. 2002 *Do Wildlife Passages Act as Prey-Traps?* Biological Conservation **107**:135-145

Catling 1994 *Brunswick Heads Bypass Pacific Highway Environmental Impact Assessment Report* (NSW Roads and Traffic Authority: Sydney)

Department of Environment and Conservation (DEC) 2005 *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales*, DEC Goulburn Street, Sydney NSW.

Department of Environment and Conservation (DEC) 2004 *Environmental Guidelines: Assessment, classification and management of liquid and non-liquid wastes* DEC Goulburn Street, Sydney NSW.

Roads and Traffic Authority 2003 *Traffic Control at Work Sites*

Roads and Traffic Authority 1988 *Road Design Guide*

Umwelt Environmental Consultants 2003 *Bulahdelah Aboriginal Place Nomination Assessment*. Prepared for the NSW National Parks and Wildlife Service

Australian Network for Plant Conservation (ANPC) 2004 *Guidelines for the Translocation of Threatened Plants*. Canberra ANPC.

Roads and Traffic Authority 1998 *Community Involvement Practice Notes and Resource Manual*

PlanningNSW 2003 *Community Engagement in the NSW Planning System* prepared for PlanningNSW by Elton Consulting,

Roads and Traffic Authority 2001 *RTA Environmental Noise Management Manual*

Department of Housing 1998 *Managing Urban Stormwater –Soils and Construction*

Acid Sulfate Soil Management Advisory Committee (ASSMAC) 1998 *Acid Sulfate Soils Manual*

