

5. Preliminary environmental assessment, management measures & further investigations

5.1 Preliminary assessment

A preliminary assessment of the potential environmental impacts of the preferred Sapphire to Woolgoolga highway upgrade and likely significance of these impacts is summarised in Table 5.1. This assessment is based on the comprehensive investigations undertaken through the route planning stage and, where relevant, the findings from more recent studies focused on the preferred route. The issues that have been identified as requiring further assessment during the Environmental Assessment stage are shown in Table 5.2 and the suggested scope of those further assessments has been summarised.

This assessment has been completed with reference to two relevant publications; “Is an EIS Required? Best Practice Guidelines for Part 5 of the Environmental Planning and Assessment Act 1979”, NSW Government, Department of Urban Affairs and Planning (DUAP, now DoP) and the “EIS Guideline Roads and Related Facilities”, DUAP (now DoP) September 1996. In this regard, simple descriptors of the likely level of impact significance have been included.

The table also identifies possible environmental management and mitigation measures that the RTA currently proposes to incorporate in finalising the concept development of the Sapphire to Woolgoolga proposal. The measures represent a combination of best practice designs, techniques, systems and methods that the RTA has implemented on many recent and current highway projects. It is possible that some of these measures will be supplemented and refined as the technical design is advanced and the concurrent planned environmental impact assessments are completed over the coming months.

In considering each environmental planning issue, a level of ‘Proposed Assessment and Management’ was assigned. This indicates whether additional environmental assessment is required or whether standard management measures are sufficient to address the issue. These Proposed Assessment and Management levels are defined as follows:

- **Issues Manageable- no further assessment proposed**

No further assessment proposed on this issue as the RTA considers that the issue can be adequately managed using standard or previously approved procedures that are accepted within the industry. The proposed procedures will be identified in the relevant Environmental Management Plan (EMP) for the project and the measures will be summarised in the Environmental Assessment.

- **Define Management Measures- Design/ EMP**

The issue is not routine and may have some site specific or project peculiarities but the RTA has assessed that the standard or proven management measures can be readily adapted or tailored to address the specific circumstances to achieve an effective outcome. The proposed measures will be detailed as necessary in the refined design and/or the relevant Environmental Management Plan for the project. As well as being subject to a preliminary environmental assessment (as identified in Table 5.1), proposed future actions for these issues are identified in Table 5.3.

- **Further Environmental Assessment proposed**

The RTA considers that this issue requires further assessment during the ongoing design refinement and environmental assessment phase. Proposed measures to manage this issue will be detailed in the concept design and the Environmental Assessment. As well as being subject to a preliminary environmental assessment (as identified in Table 5.1), proposed future actions for these issues are identified in Table 5.2.

A draft Statement of Commitments has also been developed for the proposal and it is presented in Appendix A (and referred to in Table 5.1). This statement will be developed further during the

subsequent environmental impact assessment process and will be presented in the published Environmental Assessment.

Table 5.1 Environmental Investigations, Assessment, and Commitments/Management Measures

This table provides a summary of the environmental assessment issues of interest for the construction and operation of the Sapphire to Woolgoolga proposal. Further details are provided in the main body of this report and in a series of Reports and Working Papers developed during the route option identification stage. The purpose of this table is to identify those issues which are expected to be most important in the final decision process, as well as those more routine issues which can be readily managed through standard environmental management measures (ie. not key issues). In the case of the latter, this has been based in on the findings of extensive previous studies and / or design changes to the project in order to eliminate or significantly reduce environmental risks associated with the issue. Furthermore, to ensure the level of residual impacts remain acceptable and that there is a consistent approach to managing issues, the RTA includes a commitment to adopt standard conditions of approval (as developed by the Department of Planning). It is expected that this commitment would be carried through to the Environmental Assessment and ultimately to the final conditions of approval as issued by the Minister for Planning. It is noted that the judgement as to whether an issue is not a key issue will be confirmed during the detailed EA process, and that the evaluation at this time is not binding.

Issue	Existing Investigations	Potential Impact (incorporating mitigation)	Proposed Assessment and Management Level	Proposed Management Measures
CONSTRUCTION PHASE				
Noise and Vibration	Noise monitoring and modelling undertaken as part of route options assessment Working Paper.	<p>Potential for construction noise levels to exceed the criteria specified in the RTA's Environmental Noise Management Manual. However, residual impacts would be managed to acceptable levels with the application of standard noise control management measures.</p> <p>Expected level of Impact: Low – Negative</p> <p>Community consultation has consistently raised construction noise as an issue of concern, hence issue to be addressed in EA to demonstrate it can be effectively managed.</p>	Define Management Measures-Design/EMP	Residual impacts expected to be manageable through the application of appropriate management plans, controls, mitigation measures and safeguards as identified in Section 5 in the Draft Statement of Commitments (Appendix B).
Air Quality	Air quality monitoring undertaken by specialists from CW-ATC at Korora site adjacent to existing dual carriageway section of highway.	Potential for dust generation during earthworks and other construction activities and from construction vehicle movements. Local air quality impacts due to construction vehicle emissions.	Issues Manageable-no further assessment proposed	Residual impacts expected to be manageable through the application of appropriate management plans, controls, mitigation measures and safeguards as identified in

Issue	Existing Investigations	Potential Impact (incorporating mitigation)	Proposed Assessment and Management Level	Proposed Management Measures
	<p>The baseline studies indicate generally low background pollution levels.</p>	<p>Expected level of Impact: Low - Negative</p>		<p>Section 11 in the Draft Statement of Commitments (<i>Appendix B</i>).</p>
<p>Terrestrial Flora and Fauna</p>			<p>Further Environmental Assessment proposed</p>	
<p><u>Threatened Species/Habitats</u></p>	<p>Comprehensive Working Paper prepared as part of route option evaluation process.</p> <p>Comparative assessment of options in terms of ecological impacts conducted by flora / fauna specialists from CW, Ecovision, Ecotone and A Benwell as part of route selection process. Included review of substantial databases from CHCC, DEC, Forests NSW, conduct of substantial assorted field surveys, vegetation / habitat mapping, liaison with DEC and CHCC. Detailed ecological surveys completed to identify presence / extent / condition of potential species / EECs along parts of route not previously accessible. Supplementary surveys to address warm season issues (eg. migratory birds, targeted frog species) and other key information from previous work (eg. extent / density of stags).</p>	<p>Loss of or disturbance to threatened flora and fauna species.</p> <p>Potential impact on endangered ecological communities (EECs) including:</p> <p>Lowland rainforest on floodplain; Subtropical coastal floodplain forest; Swamp oak floodplain forest; Swamp sclerophyll forest</p> <p>Expected level of Impact: Moderate - Negative</p>		<p>The scope of the environmental assessment is outlined in <i>Table 5.2</i>.</p> <p>Where feasible and practical, concept design to be refined to avoid and/or minimise potential impacts on threatened / endangered flora and fauna species and endangered ecological communities. Where not feasible and practical to avoid and/or minimise potential impacts, concept design to be refined to include flora and fauna protection measures.</p> <p>Commitment to implement compensatory habitat proposals based on findings of supplementary investigations if not feasible or practical to refine concept design to avoid and/or minimise potential impacts or to include flora and fauna protection measures.</p> <p>Residual impacts expected to be manageable through the application of appropriate management plans, controls, mitigation measures and safeguards as identified in Section 7 in the Draft Statement of Commitments (<i>Appendix B</i>).</p> <p>Although the proposal is not perceived to have a significant impact on threatened and migratory species, a referral under the EPBC Act would be made to DEH to confirm that the proposal is not a</p>

Issue	Existing Investigations	Potential Impact (incorporating mitigation)	Proposed Assessment and Management Level	Proposed Management Measures
<u>Vegetation</u>	As above	Vegetation clearance and loss of habitat Expected level of Impact: Moderate - Negative		<p>“controlled action”</p> <p>The scope of the environmental assessment is outlined in <i>Table 5.2</i>.</p> <p>Footprint of road and vegetation clearance to be kept to a minimum to avoid and/or minimise potential impacts on vegetation clearance and loss of habitat. Native species of local providence to be used in landscape planting. Commitment to implement compensatory habitat proposals based on findings of supplementary investigations if not feasible or practical to avoid and/or minimise potential impacts on vegetation clearance and loss of habitat.</p> <p>Residual impacts expected to be manageable through the application of appropriate management plans, controls, mitigation measures and safeguards as identified in Section 7 in the Draft Statement of Commitments (<i>Appendix B</i>).</p>
Aquatic Ecology	Aquatic habitat assessment completed as part of the route option study Working Paper.	Potential for Impacts on aquatic habitat Expected level of Impact: Low - Negative	Issues Manageable- no further assessment proposed	<p>Major creeks are to be bridged and loss of riparian vegetation to be minimised. Design to be undertaken in accordance with DPI Fisheries Guidelines.</p> <p>Residual impacts expected to be manageable through the application of appropriate management plans, controls, mitigation measures and safeguards as identified in Section 7 in the Draft Statement of Commitments (<i>Appendix B</i>).</p>
Geotechnical / Soils / Contamination	Geotechnical investigation incorporating subsurface assessment, preliminary soil and	Movement of sediment down slopes, possibility of entering waterways, transportation ways and properties. Small scale stability concerns. Small scale soil contamination concerns.	Issues Manageable- no further assessment proposed	Adequate protection of both cut batters and fill embankments to be provided. Measures would include grassing and the provision of cut-off drains

Issue	Existing Investigations	Potential Impact (incorporating mitigation)	Proposed Assessment and Management Level	Proposed Management Measures
	<p>groundwater contamination assessment and acid sulfate soil assessment undertaken as part of Route Option stage.</p> <p>Acid Sulphate Soils (ASS) mapping shows there to be a low risk of ASS within the study area, with the exception of areas on the floodplain between Moonee and Woolgoolga and surrounding the existing highway at Arrawarra.</p> <p>DEC and Department of Agriculture have confirmed that no sites comprising a significant risk of harm under the Contaminated Land Management Act 1997 are potentially directly affected by the proposal. Soil investigations on banana plantations included identified high-risk areas (eg packing sheds). The investigations indicated that contaminant concentrations in the soil were below the adopted site assessment criteria. No cattle tick dip sites are affected</p>	<p>Expected level of Impact: Low - Negative</p>		<p>and landscaping to divert water away from the cut and fill batters. Sediment traps to be implemented. Removal of vegetation during construction only where absolutely necessary.</p> <p>Residual impacts expected to be manageable through the application of appropriate management plans, controls, mitigation measures and safeguards as identified in Section 10 in the Draft Statement of Commitments (Appendix B).</p>

Issue	Existing Investigations	Potential Impact (incorporating mitigation)	Proposed Assessment and Management Level	Proposed Management Measures
Groundwater	<p>Geotechnical investigation incorporating preliminary soil and groundwater contamination assessment as well as groundwater bore information received from DLWC.</p> <p>DEC and Department of Agriculture have confirmed that no contaminated soil or groundwater sites are affected by the proposal.</p>	<p>It is possible that deep cuts will locally lower the water table and may have adverse affects on water levels and yields in existing water bores. Low/minimal risk of groundwater contamination.</p> <p>Expected level of Impact: Low - Negative</p>	<p>Issues Manageable- no further assessment proposed</p>	<p>Continual monitoring of bores during and post-construction phase.</p> <p>Residual impacts expected to be manageable through the application of appropriate management plans, controls, mitigation measures and safeguards as identified in Section 10 in the Draft Statement of Commitments (Appendix B).</p>
Water Quality	<p>Considerable background data held by Coffs Harbour Council. No particular unusual/high sensitive areas anticipated or where impacts are unmanageable</p>	<p>Impact upon the turbidity, pH, DO, concentration of ions and TDS of local waterways</p> <p>Expected level of Impact: Low - Negative</p>	<p>Issues Manageable- no further assessment proposed</p>	<p>Monitoring of affected waterways during and post-construction phase.</p> <p>Risk analysis of all aspects of the activity that has the potential to pollute water to be undertaken, eg stormwater.</p> <p>Measures to minimise the identified risk to the environment would then be implemented. Special emphasis would be placed on gully and watercourse crossings, vehicle set down and repair areas, fuel storage and waste disposal.</p> <p>Compliance with Water Quality guidelines.</p> <p>Residual impacts expected to be manageable through the application of appropriate management plans, controls, mitigation measures and safeguards as identified in Section 10 in the Draft Statement of Commitments (Appendix B).</p>
Traffic and	<p>Concept design developed with</p>	<p>Implementation of the upgrade may be staged. Staging</p>	<p>Further Environmental</p>	<p>The scope of the environmental assessment is</p>

Issue	Existing Investigations	Potential Impact (incorporating mitigation)	Proposed Assessment and Management Level	Proposed Management Measures
Transport	regard to construction in high traffic area at southern end of project.	<p>opportunities include:</p> <ul style="list-style-type: none"> • Early provision of interchanges to access the existing and future residential areas along the route, and/or • Implementation of Class A/M upgrade to improve the safety and efficiency of the existing highway. <p>Potential traffic disruptions on highway and local roads during construction, especially along southern upgrade highway sections.</p> <p>Expected level of Impact: Moderate – Negative</p>	Assessment proposed	<p>outlined in <i>Table 5.2</i>.</p> <p>Construction traffic impacts to be assessed in Traffic Delay Assessment.</p> <p>Residual impacts expected to be manageable through the application of appropriate management plans, controls, mitigation measures and safeguards as identified in Section 4 in the Draft Statement of Commitments (<i>Appendix B</i>).</p>
Agriculture	Preliminary agricultural assessment Working Paper prepared as part of route selection process by specialists Wilkie Fleming.	<p>35 agricultural properties would be affected by the bypass alignment. Preliminary agricultural assessment identified that 17 properties would be severely disrupted.</p> <p>Potential implications for aerial spraying of bananas.</p> <p>Expected level of Impact: High - Negative</p>	Further Environmental Assessment proposed	<p>The scope of the environmental assessment is outlined in <i>Table 5.2</i>.</p> <p>Where feasible and practical, road alignment and concept design to be refined to minimise potential impacts on agricultural properties.</p> <p>Where feasible and practical, new access provided to severed parcels and / or possible land consolidation of severed parcels to be pursued.</p> <p>Acquisition to be undertaken in accordance with the <i>Land Acquisition (Just Terms Compensation) Act 1991</i></p>
Land use, Property and Access	Comparative assessment of impacts on land use / development / property Working Paper prepared as part of route selection process.	<p>Potential direct impact on approximately 130 residential, agricultural and rural residential properties along whole length of the upgrade.</p> <p>Expected level of Impact: High – Negative.</p>	Further Environmental Assessment proposed	<p>The scope of the environmental assessment is outlined in <i>Table 5.2</i>.</p> <p>Where feasible and practical, road alignment and concept design to be refined to minimise potential impacts on properties.</p> <p>Where feasible and practical, new access provided to severed parcels and / or possible land consolidation of severed parcels to be pursued.</p>

Issue	Existing Investigations	Potential Impact (incorporating mitigation)	Proposed Assessment and Management Level	Proposed Management Measures
				Acquisition to be undertaken in accordance with the <i>Land Acquisition (Just Terms Compensation) Act 1991</i>
Hazards and Risks		Potential impacts include storage of hazardous materials. Expected level of Impact: Low - Negative	Issues Manageable- no further assessment proposed	Residual impacts expected to be manageable through the application of controls, mitigation measures and safeguards as identified in Section 14 in the Draft Statement of Commitments (Appendix B).
Aboriginal heritage	Working Paper prepared by heritage specialist J Collins as part of route selection process. Ongoing consultation with LALCs, other Aboriginal representative groups and DEC. Aboriginal heritage study (incorporating a heritage assessment and field survey) for preferred route completed by heritage specialist J Collins in October 2005.	Impact from clearing of forested lands, which are valued by the Aboriginal community. Direct impact on western flank of important Aboriginal heritage site near Coffs Harbour Gun Club. 7 PADs potentially directly affected by proposal. Expected level of Impact: Moderate – Negative	Define Management Measures- Design/EMP	Further consultation with DEC and the Aboriginal community using the DEC Interim Guidelines during the further refinement of the concept design for the proposal and during the development of the Aboriginal Cultural Heritage Management Plan. Residual impacts expected to be manageable through the application of controls, mitigation measures and safeguards as identified in Section 8 in the Draft Statement of Commitments (Appendix B).
Non-Aboriginal heritage	Working Paper prepared including desktop reviews and database research as part of Route Option studies. Consultation with key government stakeholders including Australian Heritage Commission, NSW Heritage Office, National Trust, Coffs Harbour Council and Coffs Harbour Historical Society.	There is the potential that the proposal could have a very minor impact on the Solitary Islands Marine Park (SIMP) during construction where it extends to the tidal limits of Double Crossing Creek. SIMP is an item listed on the Register of the National Estate (but is not on the National Heritage List or the Commonwealth Heritage List). Other heritage items along the corridor which are affected but not formally listed on any heritage register include the Woolgoolga Nursery, the Nursery Cottage, Wedding Bells	Issues Manageable- no further assessment proposed	Relevant statutory controls would be complied with by the RTA Residual impacts expected to be manageable through the application of appropriate management plans, controls, mitigation measures and safeguards as identified in Section 9 in the Draft Statement of Commitments (Appendix B).

Issue	Existing Investigations	Potential Impact (incorporating mitigation)	Proposed Assessment and Management Level	Proposed Management Measures
		<p>State Forest and the original route of two former timber logging tramways.</p> <p>Expected level of Impact: Low – Negative</p>		<p>Potential impacts on the Solitary Islands Marine Park to be included in the referral to DEH.</p>
Resources		<p>Energy and resource use during the construction period.</p> <p>Expected level of Impact: Low - Negative</p>	<p>Issues Manageable- no further assessment proposed</p>	<p>Measures to be implemented to minimise energy use to be incorporated into the CEMP. Consideration of mass haul efficiency in design development to reduce fuel burn.</p> <p>Residual impacts expected to be manageable through the application of appropriate management plans, controls, mitigation measures and safeguards as identified in Section 12 in the Draft Statement of Commitments (Appendix B).</p>
Landscape, visual and urban design	<p>Comparative assessment of options conducted by specialist urban designers / landscape architects Hassell as part of route selection process</p>	<p>Visual impacts and loss of visual amenity along the existing highway upgrade and bypass sections in project area renowned for its scenic qualities.</p> <p>Adverse visual impacts anticipated - particularly between Sapphire and Moonee and through the southern and central sections of the Woolgoolga bypass.</p> <p>Expected level of Impact: Moderate to High Negative.</p>	<p>Further Environmental Assessment proposed</p>	<p>The scope of the environmental assessment is outlined in <i>Table 5.2</i>.</p> <p>Suitable urban design and landscape management strategies/ plans to be developed and incorporated into the project design.</p> <p>Residual impacts expected to be manageable through the application of appropriate management plans, controls, mitigation measures and safeguards as identified in Section 13 in the Draft Statement of Commitments (<i>Appendix B</i>).</p>

Issue	Existing Investigations	Potential Impact (incorporating mitigation)	Proposed Assessment and Management Level	Proposed Management Measures
OPERATIONAL PHASE				
Traffic Noise	Working Paper prepared as part of route option study. Comparative noise assessment undertaken.	<p>Positive and negative impacts depending upon specifics of location (eg noise source moved from bypassed areas, noise source introduced to new alignment). RTA would endeavour to meet appropriate DEC criteria.</p> <p>Expected level of Impact: Moderate Positive to Moderate / High Negative.</p>	Further Environmental Assessment proposed	<p>The scope of the environmental assessment is outlined in <i>Table 5.2</i>.</p> <p>RTA would endeavour to meet appropriate DEC criteria.</p> <p>Detailed noise assessment to be undertaken. Assessment will identify potential noise impacts of upgrade and proposed mitigation measures.</p> <p>Proposed mitigation measures to be incorporated into refined concept design for proposal.</p> <p>Residual impacts expected to be manageable through the application of appropriate management plans, controls, mitigation measures and safeguards as identified in Section 6 in the Draft Statement of Commitments (<i>Appendix B</i>).</p>
Cultural/Socio-economic/Community			Further Environmental Assessment proposed	
General	<p>Comparative assessment of impacts on land use / development / property as part of route selection process. Key community issues consistently identified included:</p> <ul style="list-style-type: none"> Property impacts 	<p>Community cohesion in Woolgoolga urban area enhanced due to substantial traffic diversion to bypass, including improved amenity and local community access across existing highway corridor.</p> <p>Community cohesion in west Woolgoolga rural area affected by new route.</p>		<p>The scope of the environmental assessment is outlined in <i>Table 5.2</i>.</p> <p>Design to ensure bypass remains attractive for through traffic. Where feasible and practical, maintain road access to rural properties during and after construction. New crossings to be provided for</p>

Issue	Existing Investigations	Potential Impact (incorporating mitigation)	Proposed Assessment and Management Level	Proposed Management Measures
	<ul style="list-style-type: none"> • Socio-economic • Noise and Vibration • Air Quality • Road Safety. 	<p>Issues with school bus access routes and potential conflicts with Highway traffic – see also “Local Traffic”.</p> <p>Expected level of Impact: Moderate – Negative</p>		<p>safer cross highway access for locals including at Headland Road bridge and interchanges.</p> <p>Property acquisition to be undertaken in accordance with the <i>Land Acquisition (Just Terms Compensation) Act 1991</i></p>
Local Sikh Community	Sikh Cultural Impact Assessment in Progress	<p>Community concern that impact on and or acquisition of Sikh owned / operated rural properties in bypass section could result in broader cultural effect of consequence for the community</p> <p>Expected level of Impact: Low- Negative</p>	Further Environmental Assessment Proposed	<p>The scope of the environmental assessment is outlined in <i>Table 5.2</i>.</p> <p>Proposed Management Measures to be developed through assessment</p>
Traffic and transport			Further Environmental Assessment proposed	
<u>Strategic / Regional</u>	<p>Working Paper prepared as part of Route Option Study.</p> <p>Detailed traffic surveys and studies including quantification of existing traffic patterns, forecasts of traffic growth along corridor, analysis of intersection performance, identification of traffic / road safety risk issues, assessment of historic and recent crash data for highway, estimate of safety improvement with upgrade.</p>	<p>Expected overall road safety improvements due to increased road capacity and high standard dual carriageway design. Improvements also expected with rationalised highway access points and through – local traffic separation with reduced highway connections and local access roads etc. Substantial improvements in Woolgoolga area due to reduced traffic volumes.</p> <p>Expected level of Impact: High - Positive</p>		<p>The scope of the environmental assessment is outlined in <i>Table 5.2</i>.</p> <p>Adopt standards in Pacific Highway design guideline and refine concept design to further enhance safety over project life.</p>
<u>Local</u>	Design and traffic assessments have identified and where possible quantified all changed local traffic patterns.	<p>Impacts on school bus routes and conflicts with Highway traffic</p> <p>Changed travel patterns on numerous local roads</p>		<p>The scope of the environmental assessment is outlined in <i>Table 5.2</i>.</p> <p>Design to provide for eventual off-highway local road along full length of corridor with controlled access to</p>

Issue	Existing Investigations	Potential Impact (incorporating mitigation)	Proposed Assessment and Management Level	Proposed Management Measures
	<p>Traffic assessments have estimated bypassable traffic and hence likely future volumes remaining through Woolgoolga</p>	<p>especially along southern upgrade section from Sapphire to Moonee including increased trip length and duration due to road closures, turn restrictions and deviations (but with attendant travel safety improvements)</p> <p>Reduction of traffic volumes through Woolgoolga with local traffic and accessibility benefits in the area.</p> <p>Expected level of Impact: Low – Negative</p>		<p>the highway</p> <p>Design to include features for efficient new local access.</p> <p>Design to ensure bypass section is attractive for through traffic.</p>
<p>Urban Development</p>	<p>Comparative assessment of impacts on land use / development / property as part of route selection process</p>	<p>Preferred route developed following request from CHCC for the RTA to investigate route options to minimise the potential impact on the South Woolgoolga Urban Investigation Area and to facilitate the future expansion of the township.</p> <p>Bypass section passes across the south west corner of South Woolgoolga Urban Investigation Area (currently agricultural use). No detailed development plans for area prepared to date by CHCC. Most of potential development could proceed with Bypass in place.</p> <p>Issues for residential expansion near Moonee Beach and consequences for Highway interchange design/timing</p> <p>Expected level of Impact: Low – Negative</p>	<p>Further Environmental Assessment proposed</p>	<p>The scope of the environmental assessment is outlined in <i>Table 5.2</i>.</p> <p>Amenity considerations to be considered in concept design including buffer areas, noise mitigation and landscaping</p>

Issue	Existing Investigations	Potential Impact (incorporating mitigation)	Proposed Assessment and Management Level	Proposed Management Measures
Forestry Issues	Liaison with Forests NSW to obtain data on existing forestry operations and expected long term use of Forest including access requirements	<p>Bypass section passes through substantial productive State forest lands.</p> <p>Route passes close to two parcels of land designated as Forestry Management Zone (FMZ) 3A. Depending on the final design it is possible that these could be impacted on during construction. The route also passes through one parcel of land designated as FMZ3B at its northern end</p> <p>Expected level of Impact: Moderate – Negative</p>	Further Environmental Assessment proposed	<p>The scope of the environmental assessment is outlined in <i>Table 5.2</i>.</p> <p>Review alignment and if possible, avoid or minimise impact on FMZ 3B land.</p> <p>Access to Wedding Bells State Forest from existing highway to be rationalised. Compensatory measures to be examined as part of EA.</p>
Flooding and Hydrology	A preliminary catchment analysis has been undertaken, which has identified major waterways and catchments in the northern section of the study area. Also examined location and condition of all existing road crossings. In accordance with Australian Rainfall and Runoff Volume 1, preliminary and peak discharges calculated.	<p>Concept design would be developed to ensure project does not cause any significant adverse flooding impacts, including afflux, flood levels, velocities, duration and inundation times.</p> <p>Expected level of Impact: Low – Negative</p>	Issues Manageable- no further assessment proposed	<p>All water-way crossings would be located and sized so as to not cause any significant adverse flooding impacts.</p> <p>Residual impacts expected to be manageable through the application of appropriate management plans, controls, mitigation measures and safeguards as identified in Section 10 in the Draft Statement of Commitments (<i>Appendix B</i>).</p>
Water Quality	Considerable background data held by Coffs Harbour Council. No particular unusual/high sensitive areas anticipated or where impacts are unmanageable	<p>Potential Impact upon the turbidity, pH, DO, concentration of ions, TDS and general aquatic environment of local waterways</p> <p>Expected level of Impact: Low – Negative</p>	Issues Manageable- no further assessment proposed	<p>Potential issue of accidental spills during the operational phase of the highway would be addressed. General pollution reduction measures would be in the form of detention structures or contingency plans or a combination of both and would be effective in minimising harm from accidental spills in particular.</p> <p>Areas that are deemed to have particularly high conservation and sensitivity values would be identified, and additional management methods</p>

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				<p>instigated.</p> <p>Residual impacts expected to be manageable through the application of appropriate management plans, controls, mitigation measures and safeguards as identified in Section 10 in the Draft Statement of Commitments (Appendix B).</p>
Flora/Fauna	Refer to 'Flora / Fauna' in Construction section above	<p>Biodiversity – the Woolgoolga bypass section has the potential to impact on biodiversity in the Wedding Bells State Forest.</p> <p>Expected level of Impact: Low – Negative</p>	Further Environmental Assessment proposed	<p>The scope of the environmental assessment is outlined in <i>Table 5.2</i>.</p> <p>Opportunities to avoid, minimise and/or mitigate biodiversity impacts (see above) including possible compensatory habitat.</p>
Economic	Comparative assessment of direct / indirect impacts on land use / development / property as part of route selection process. Concept design progressed with regard to local business impact in terms of property affectation. Consultation with assorted business stakeholders and CH / Woolgoolga Chambers of Commerce	<p>Positive overall impact on local economy (including tourism) due to enhanced road transport conditions and travel time / safety improvements through the study area.</p> <p>Potential impact on amenity of adjacent tourist facilities along the route.</p> <p>Although the local economy of Woolgoolga does not have a heavy reliance on highway related trade, there would be some loss in patronage to businesses along the existing Highway when a bypass is operational.</p> <p>Agricultural business implications considered under 'Agriculture'</p> <p>Expected level of Impact: Moderate - Positive to Moderate – Negative</p>	Define Management Measures- Design/EMP	<p>Implement high standard design and implement the project as soon as possible.</p> <p>Acoustic controls and urban design treatments to be incorporated into new highway design. Property access arrangements improved in terms of safety.</p> <p>Provide effective alternative access consistent with highway access control objectives</p> <p>Provide effective signposting and high standard access at northern and southern approaches to Woolgoolga.</p>
Air quality	Liaison with DEC during route selection indicated no substantial	Reduced vehicle emissions through Woolgoolga due to bypass and along existing highway between Sapphire and	Issues Manageable- no further assessment	Adopt relevant road design standard with minimal gradients and curves to facilitate free flow

Issue	Existing Investigations	Potential Impact (incorporating mitigation)	Proposed Assessment and Management Level	Proposed Management Measures
	<p>air quality issues / concerns in study area. Air quality monitoring undertaken by specialists from CW-ATC at Korora site adjacent to existing dual carriageway section of highway.</p>	<p>south Woolgoolga due to free traffic flow along new high standard dual carriageway highway.</p> <p>Additional vehicle emissions with progressive traffic growth along corridor including introduction of near-field emissions to new rural areas along bypass section.</p> <p>Expected level of Impact: Low - Negative</p>	<p>proposed</p>	<p>conditions.</p> <p>Reduction in exhaust emissions through Woolgoolga township</p> <p>Residual impacts expected to be manageable through the application of appropriate management plans, controls, mitigation measures and safeguards as identified in Section 11 in the Draft Statement of Commitments (Appendix B).</p>
<p>Hazards and wastes</p>	<p>No specific investigations into this matter, but draws on previous experience of traffic specialists including review of spill incident statistics</p>	<p>Reduced potential for hazardous material spillage or incident with higher standard road</p> <p>Expected level of Impact: Low - Positive</p>	<p>Issues Manageable- no further assessment proposed</p>	<p>Spill containment measures / facilities for incidents near sensitive environments to be incorporated into design.</p> <p>Residual impacts expected to be manageable through the application of appropriate management plans, controls, mitigation measures and safeguards as identified in Sections 14 and 15 in the Draft Statement of Commitments (Appendix B).</p>
<p>Cumulative Impacts</p>	<p>Cumulative impact assessment undertaken by RTA</p>	<p>The overall Pacific Highway program is expected to generate cumulative impacts (both beneficial and adverse) with issues relating to traffic growth (especially in heavy vehicles) being of particular community concern due to potential traffic noise and road safety concerns.</p> <p>Expected level of Impact: Low to Moderate – Positive</p>	<p>Define Management Measures- Design/EMP</p>	<p>Adopt design standard and capacity of proposal that provides acceptable safety outcome and level of service for life of project</p>
<p>Ecologically Sustainable Development</p>	<p>No specific investigations into this matter</p>	<p>Inter-generational Equity – proposal is new transport infrastructure that would benefit current and future generations by enabling safe and efficient travel through and within the area for multiple social and economic</p>	<p>Issues Manageable- no further assessment proposed</p>	<p>Commitment to ongoing maintenance and planned later stage upgrades so the proposal continues to provide functional benefits to the road user and local community.</p>

Issue	Existing Investigations	Potential Impact (incorporating mitigation)	Proposed Assessment and Management Level	Proposed Management Measures
		<p>purposes.</p> <p>Precautionary Approach – development of major new infrastructure into new rural / natural environment (especially bypass section) has the potential to introduce assorted environmental impacts, the nature and extent of which are generally well understood.</p> <p>Issues regarding ecology integrity and economic values are addressed in other sections above.</p> <p>Expected level of Impact: Low – Positive</p>		<p>From its significant experience, the RTA has developed many proven systems, methods and techniques to effectively understand and manage environmental risks. Many of these management opportunities and proposals are identified above.</p> <p>Residual impacts expected to be manageable through the application of appropriate management plans, controls, mitigation measures and safeguards as identified in Section 12 in the Draft Statement of Commitments (Appendix B).</p>

5.2 Proposed scope of environmental assessment

As identified in Table 5.1, there would be a number of relatively minor impacts associated with the construction and operation of the proposal that could be effectively managed and/or adequately mitigated through the application of standard or tailored mitigation measures (including standard conditions of approval developed by the DoP). There are also a number of more significant environmental impacts which require further investigation and assessment.

Reforms to the EP&A Act in 2005 (with the introduction of an Environmental Assessment under Part 3A) now encourage proponents to prepare more focused environmental assessments to ensure that appropriate weight is given to addressing the more significant environmental issues in detail. Management and mitigation measures to address the relatively minor impacts would be addressed through a Statement of Commitments. A Draft Statement of Commitments for the Sapphire to Woolgoolga Project is shown in Appendix B.

The more focused approach to the EA also recognises the substantial amount of assessment undertaken in the route selection process. Similarly the preliminary design for the highway upgrade has also considered environmental issues and has incorporated refinements to the alignment and design of the highway to avoid or minimise impacts.

In accordance with the preliminary environmental assessment undertaken for the project, two separate tables have been compiled and are presented below. Table 5.2 describes the proposed scope for the environmental assessment (ie. issues identified in Table 5.1 as having a proposed assessment level of “further environmental assessment proposed”). Table 5.3 identifies the issues that require mitigation measures / management issues to be developed and adapted for the proposal.

Table 5.2 Proposed Scope of Environmental Assessment

Issue	Scope of Environmental Assessment
CONSTRUCTION PHASE	
Terrestrial Flora and Fauna	<ul style="list-style-type: none"> • Describe and quantify threatened species and areas of habitat likely to be impacted • Describe type and location of mitigation measures to be implemented during construction • Outline any compensatory habitat proposals, if required.
Traffic and transport	<ul style="list-style-type: none"> • Identify and describe local road network changes during construction • Outline traffic management measures to be included in the Construction Traffic Management Plan
Agriculture	<ul style="list-style-type: none"> • Assess local agricultural industry / economy effects to farm level. NB temporary construction stage impacts and interface with longer term operation stage issues to be addressed concurrently • Outline limitations on aerial spraying and viability of alternative management methods • Assess opportunities for consolidation of severed parcels with adjacent properties
Land use, property and access	<ul style="list-style-type: none"> • Identify properties requiring full or partial acquisition • Identify, for each affected property, the approximate

	<p>number of hectares required, the total number of hectares of the operational area, and the percentage required</p> <ul style="list-style-type: none"> • Determine the impact of the proposal on the current land use of the property • Describe changes to the internal access arrangements where properties are severed by the proposal. • Identify and evaluate measures included in the design to mitigate adverse changes to access during construction.
Landscape, visual, urban design	<ul style="list-style-type: none"> • Undertake Visual Impact Assessment, including detailed account of management objectives / plan with assorted graphic to explain urban design and landscape measures that will form part of proposal • Describe how urban design and landscape management strategies / plans have been developed and incorporated into the project design
OPERATIONAL PHASE	
Traffic noise	<ul style="list-style-type: none"> • Describe the design features included to reduce road traffic noise to below road traffic noise criteria. • Describe the impact at sensitive receiver locations where operational noise is predicted to exceed road noise criteria. • Describe the management measures proposed to mitigate impacts at identified sensitive receiver locations.
Cultural/Socio-economic/community	<ul style="list-style-type: none"> • Provide details of the issues identified through community consultation and how these issues have been addressed • Address key community issues consistently identified: property impacts, Socio-economic, noise and vibration, air quality, road safety • Undertake specific assessment of cultural impacts on Sikh community
Traffic and transport	<ul style="list-style-type: none"> • Describe benefits of design and estimate crash reduction potential • Describe and quantify local road network changes including benefits and disbenefits; Prepare local traffic access strategy • Describe existing and possible future school bus routes and assess the potential benefits and disbenefits of the proposal
Urban Development	<ul style="list-style-type: none"> • Assess the impact of urban development program/proposals on design requirements/timing.

Forestry issues	<ul style="list-style-type: none"> Assess short and long term impacts on planned forestry operations. Liaison with Forests NSW to agree on land acquisition and specific access provisions for forestry operations during operation;
Terrestrial Flora and Fauna	<ul style="list-style-type: none"> Outline monitoring program of mitigation measures during operation

Table 5.3 Issues requiring definition of Management Measures

Issue	Proposed Actions
CONSTRUCTION PHASE	
Noise and vibration	<ul style="list-style-type: none"> Describe construction noise and vibration impacts Identify appropriate noise and vibration criteria Describe proposed management and mitigation measures
Aboriginal Heritage	<ul style="list-style-type: none"> Identify modifications to road design to minimise impact on significant heritage site near Coffs Harbour Gun Club Further consultation with DEC and the Aboriginal community using the DEC Interim Guidelines during the further refinement of the concept design for the proposal and during the development of the Aboriginal Cultural Heritage Management Plan.
OPERATIONAL PHASE	
Economic Impacts	<ul style="list-style-type: none"> Qualitatively assess business effects, in particular for agricultural operations and impacts of bypass on passing trade Identify measures to mitigate any adverse impacts
Cumulative Impacts	<ul style="list-style-type: none"> Identify management measures / control of main issues of community concern