



APPENDIX A7

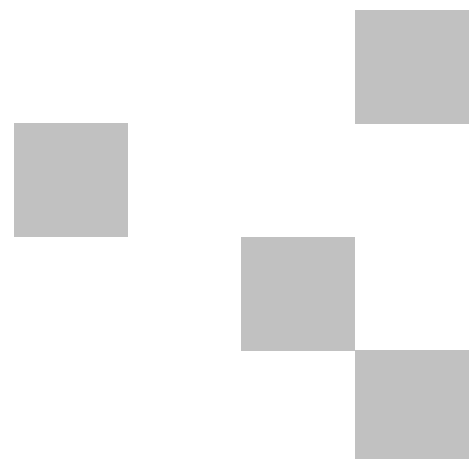
Other relevant management measures

Early Works – Wave 1 & 3 (part)

Woolgoolga to Ballina

Pacific Highway Upgrade

AUGUST 2015



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[signed]

Rob Blyth



[signed]

Douglas Caldwell



[signed]

Jeff Boylan

Golding Contractors Pty Ltd
Project Manager

Golding Contractors Pty Ltd
Environmental Manger

Roads and Maritime
Authorised Delegate

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Contents

1	Other environmental mitigation and management measures.....	4
2	Compliance management	16
2.1	Roles and responsibilities	16
2.2	Training.....	16
2.3	Monitoring and inspection	16
2.4	Auditing.....	16
2.5	Reporting	16

Tables

Table 1-1	Visual, urban design and landscape management and mitigation measures.....	5
Table 1-2	Traffic and transport management and mitigation measures	8
Table 1-3	Land use and property management and mitigation measures	11
Table 1-4	Social and economic management and mitigation measures	15

Glossary / Abbreviations

CEMP	Construction Environmental Management Plan
CoA	Condition of Approval
EA	Environmental Assessment
EEC	Endangered Ecological Community
ENM	Excavated Natural Material
EPA	Environment Protection Authority
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EPA	NSW Environment Protection Authority
EPL	Environmental Protection Licence
EWMS	Environmental Work Method Statements
FM Act	<i>Fisheries Management Act 1994</i>
NOW	NSW Office of Water
OEH	Office of Environment and Heritage
ESCP	Erosion and Sediment Control Plan
RMS, Roads and Maritime Services	Roads and Maritime
VENM	Virgin Excavated Natural Material
WARR Act	<i>Waste Avoidance and Resource Recovery Act 2001</i>
CWEMP	Construction Waste and Energy Management Plan
WRAPP	Waste Reduction and Purchasing Policy

1 Other environmental mitigation and management measures

A range of environmental requirements are identified in the various environmental documents, including the EIS, Submissions / Preferred Infrastructure Report, supplementary assessments, Conditions of Approval and RMS documents, and from recent experience on similar road projects.

Relevant management measures and requirements for the project are included within the plans attached to this CEMP (Appendix B):

- Appendix B1 - Construction traffic and access management plan
- Appendix B2 - Construction flora and fauna management plan
- Appendix B3 - Construction noise and vibration management plan
- Appendix B4 - Construction soil and water quality management plan
- Appendix B5 - Construction heritage management plan
- Appendix B6 - Construction air quality management plan
- Appendix B7 - Construction waste and energy management plan
- Appendix B8 – Ancillary facilities management plan
- Appendix B9 – Borrow sites management plan
- Appendix B10 – Construction contaminated land management plan
- Appendix B11 – Construction acid sulphate materials management plan

Other relevant management measures to be addressed in construction (Visual, urban design and landscape, Traffic and transport, Land use and property and Social and economic) which have not been captured by specific plans are described in this document, see Tables 1.1 to 1.4.

Table 1-1 Visual, urban design and landscape management and mitigation measures

ID	Measure / Requirement	When to implement	Responsibility	Reference
VISUAL, URBAN DESIGN AND LANDSCAPE				
UD1	<p>The project will be carried out in accordance with the urban design and landscaping strategy, as identified in Section 11.4.1 of this EIS. Detailed landscape design for all project batters, and median planting areas will be developed in accordance with the Landscape Guidelines (RTA, 2008), the requirements of the Working Paper – Biodiversity (Section 5.2.2) and the landscape strategy to provide a robust, successful and effective planting design.</p>	Pre-construction	Project Engineer / Site Engineer	Submissions / PIR (UD3)
UD2	<p>The built form of the project, including consideration of the height, bulk, scale, materials and finishes for:</p> <ul style="list-style-type: none"> · Bridges. · Retaining walls. · Cuttings and embankments. · Road barriers. · Signage. · Fences. · Clear zones. · Topsoil management. · Water quality control ponds. · Fauna crossing. · Place marking and cultural plantings. <p>The project will be designed in accordance with the design principles identified in Working Paper – Urban Design, Landscape Character and Visual Impact, and relevant Roads and Maritime guidelines.</p>	Pre-construction	Project Engineer / Site Engineer	Submissions / PIR (UD4)
UD3	<p>Measures to mitigate visual impacts to viewpoints will be implemented, as identified in Table 11-42 and Working Paper – Urban Design,</p>	Construction	Construction Manager / Environmental Site Representative	Submissions / PIR (UD6)

ID	Measure / Requirement	When to implement	Responsibility	Reference
	Landscape Character and Visual Impact. If any further viewpoints were identified during detailed design that have a moderate-high or high impact, screen planting also be considered.			
UD4	Disturbed areas will be progressively revegetated throughout the construction period.	Construction	Construction Manager / Environmental Site Representative	Submissions / PIR (UD7)
UD5	<p>Where required, typical landscape treatments for ancillary facilities in forest areas will include:</p> <ul style="list-style-type: none"> · Providing screen planting. · Considering reinstatement of disturbed forest in heavily forested. · Considering the importance of the visual landscape at each location and allowing restoration of important forest vegetation to prominent ridge lines or other landscape elements where feasible and reasonable. · Negotiating with private landowners, as applicable, to determine future treatments for other non-forested ancillary facility locations. · Re-grading disturbed areas to achieve a sustainable and functional landform. · Stabilising all surfaces in accordance with good engineering and environmental practice. 	Construction	Construction Manager / Environmental Site Representative	Submissions / PIR (UD8)
UD6	<p>Typical landscape treatments for ancillary facilities in agricultural areas will include:</p> <ul style="list-style-type: none"> · Considering returning remnant agricultural land to agricultural uses. · Providing screen planting. · Reinstating riparian vegetation through ancillary facilities, where practicable, in the open landscape. · Considering the visual landscape at each ancillary facility and considering restoration of important forest vegetation to prominent ridge lines or other landscape elements where feasible 	Construction	Construction Manager / Environmental Site Representative	Submissions / PIR (UD9)

ID	Measure / Requirement	When to implement	Responsibility	Reference
	<p>and reasonable.</p> <ul style="list-style-type: none"> · Re-grading disturbed areas to achieve a sustainable and functional landform. · Stabilising all surfaces in accordance with good engineering and environmental practice. 			
UD7	The extent of excavation and the landscaping strategy at borrow sites will be reviewed considering material requirements on the project and the visual impact on the resultant cuttings.	Pre-construction	Project Engineer / Site Engineer	Submissions / PIR (UD10)
UD8	Landscape and rehabilitation works will be monitored and remedial measures implemented where required until vegetation has stabilised.	Operation	Project Engineer / Site Engineer	Submissions / PIR (UD13)
UD9	The mounding profile of any earth mound will blend suitably into the existing landscape setting. Any mounding to be landscaped will be compacted in 1.5 metre layers with 1:3 maximum batter slopes where reasonable in consideration of constraints within the project corridor. Where feasible and reasonable, permanent mounds will be treated with ameliorants and overlaid with topsoil to minimum 150 millimetres to ensure suitable planting conditions are achieved.	Construction	Construction Manager / Environmental Site Representative	Submissions / PIR (UD14)

Table 1-2 Traffic and transport management and mitigation measures

ID	Measure / Requirement	When to implement	Responsibility	Reference
TRAFFIC AND TRANSPORT				
T&T1	<p>Construction traffic management plans will be prepared and implemented for work sites. They will include:</p> <ul style="list-style-type: none"> • Identification of all public roads to be used by construction traffic. • Management methods to direct construction traffic to use identified roads. • Identification of all public roads that may be partially or completely closed during construction, and the expected timing and duration of closures. • Details on likely impacts on existing traffic (including pedestrians, vehicles, cyclists and disabled persons). • Temporary traffic arrangement measures, including property access. • Details on access to construction sites, including entry and exit locations, and measures to prevent construction vehicles queuing on public roads. • A response plan for any incident involving construction traffic. • Mechanisms for monitoring, reviewing and amending the success of the plans. <p>The traffic management plans be prepared in consultation with councils.</p>	Pre-construction and construction	Project Engineer / Site Engineer	Submissions / PIR (T&T1)
T&T2	<p>Traffic control schemes will be inspected as follows:</p> <ul style="list-style-type: none"> • Pre-start and pre-closedown inspections of short-term traffic controls. • Weekly inspections of long-term traffic controls. • Night-time inspections of long-term traffic controls. 	Construction	Construction Manager / Environmental Site Representative	Submissions / PIR (T&T3)
T&T3	<p>Vehicle movement plans and haulage route plans will be prepared. Drivers will be briefed on these vehicle movement plans during project induction.</p> <p>Deliveries be planned to occur outside peak traffic periods, where possible.</p> <p>To minimise queuing of construction vehicles on the highway, site personnel use two-way radios to call up haulage trucks from layover areas on a 'just in time' basis.</p>	Construction	Construction Manager / Environmental Site Representative	Submissions / PIR (T&T4)
T&T4	<p>Applications for Road Occupancy licences will be submitted to Roads and Maritime Services and the relevant council at least 10 working days prior to proposed occupancy.</p>	Pre-construction and construction	Project Engineer / Site Engineer	Submissions / PIR (T&T5)

ID	Measure / Requirement	When to implement	Responsibility	Reference
T&T5	Pre-construction road dilapidation reports will be prepared for all roads likely to be used by construction traffic. Post-construction road dilapidation reports will be prepared following the completion of construction for all roads assessed prior to construction. Dilapidation resulting from construction activity will be repaired. Copies of road dilapidation reports will be sent to the relevant roads authority.	Pre-construction and construction	Project Engineer / Site Engineer	Submissions / PIR (T&T6)
T&T6	Access be maintained to properties during construction including, where necessary and feasible, temporary alternative access unless otherwise agreed with property owners. Where any legal access is permanently affected, alternative access to an equivalent standard to and from a public road will be provided where a property has no other legal means of access and where such alternative access is feasible and practical. Where alternative access arrangements are not feasible or practical and a property is left with no access to a public road, negotiations will be undertaken with the relevant property owner for acquisition of the property in accordance with the provisions of the <i>Land Acquisition (Just Terms Compensation) Act 1991</i> .	Construction	Construction Manager / Environmental Site Representative	Submissions / PIR (T&T7)
T&T7	Where changes in access affect bus stop locations, temporary alternatives will be provided in conjunction with bus operators and affected schools to maintain access during construction.	Construction	Construction Manager / Environmental Site Representative	Submissions / PIR (T&T8)
T&T8	Where access to State forest land is affected during construction, a new access route will be provided in consultation with the Department of Primary Industries (Forests NSW).	Construction	Construction Manager / Environmental Site Representative	Submissions / PIR (T&T9)
T&T9	Where maritime traffic access to the Clarence and Richmond rivers is affected during construction of bridge crossings, appropriate signage will be provided indicating alternative means of access and the timing of the works.	Construction	Construction Manager / Environmental Site Representative	Submissions / PIR (T&T10)
T&T10	Access to the Clarence and Richmond rivers will be maintained for industry and recreational waterway users.	Construction	Construction Manager / Environmental Site Representative	Submissions / PIR (T&T11)
Access and connectivity				
T&T11	The layout of the intersection at Yamba Road will be reviewed to better meet the needs of truck movements from Harwood Mill, where reasonable and feasible.	Pre-construction	Project Engineer / Site Engineer	Submissions / PIR (T&T13)
T&T12	The need for a full interchange at Yamba Road will be investigated should traffic growth warrant it in the future and when funding is available.	Pre-construction	Project Engineer / Site Engineer	Submissions / PIR (T&T14)

ID	Measure / Requirement	When to implement	Responsibility	Reference
T&T13	The need for a full interchange with south facing ramps at Watts Lane, Harwood will be investigated should traffic growth warrant it in the future and when funding is available.	Pre-construction	Project Engineer / Site Engineer	Submissions / PIR (T&T15)
T&T14	The need for the overpass and the arrangement of local access at Chatsworth Road will be reviewed at the detailed design stage depending on specific staging and delivery of the highway.	Pre-construction	Project Engineer / Site Engineer	Submissions / PIR (T&T16)
T&T15	The need for the overpass and arrangement of local access at Carrols Lane will be reviewed at the detailed design stage depending on specific staging and delivery of the highway.	Pre-construction	Project Engineer / Site Engineer	Submissions / PIR (T&T17)
T&T16	Connectivity between the shared user path from Harwood Bridge to Yamba Road would be reviewed to refine pedestrian and cyclist access	Pre-construction	Project Engineer / Site Engineer	Submissions / PIR (T&T18)

Table 1-3 Land use and property management and mitigation measures

ID	Measure / Requirement	When to implement	Responsibility	Reference
LAND USE AND PROPERTY				
LU1	Ongoing communication and consultation will be undertaken with directly affected property owners about the property acquisition process. This includes the provision of information on the timing of acquisitions, and the process for property acquisitions under the <i>Land Acquisition (Just Terms Compensation) Act 1991</i> and Roads and Maritime' Land Acquisition Policy (RTA, 1999).	Pre-construction	Project Engineer / Site Engineer	Submissions / PIR (LU1)
LU2	Ongoing consultation will be undertaken with directly affected property owners during the detailed design phase to identify measures to mitigate potential impacts on the use and viability of land. This will relate to matters such as adjustments to fencing, access, farm infrastructure and relocation of impacted ancillary structures, as required.	Pre-construction	Project Engineer / Site Engineer	Submissions / PIR (LU2)
LU3	Property adjustments will be completed for fencing, access tracks, cattle underpasses and other farm infrastructure in consultation with the impacted land owner.	Pre-construction	Project Engineer / Site Engineer	Submissions / PIR (LU3)
LU4	The Fencing Strategy will be further developed during detailed design, in consultation with relevant stakeholders. This will build upon the principles of the strategy described in Chapter 3 of the Submissions and Preferred Infrastructure Report (Roads and Maritime, 2013).	Pre-construction	Project Engineer / Site Engineer	Submissions / PIR (LU4)
LU5	Sterilisation and severance of land uses and lots will be minimised by amalgamating severed parcels of land together, where possible, with provision of road access, in accordance with the project's remnant land use strategy.	Pre-construction	Construction Manager / Environmental Site Representative	Submissions / PIR (LU5)
LU6	Where required, acquisition of State forests will be minimised in accordance with the provisions of the <i>Forestry Act 2012</i> . Revocation of land dedicated or reserved as national parks or nature reserves will be in accordance with the <i>National Parks and Wildlife Act 1974</i> . Acquisition of land owned by Local Aboriginal Land Councils will be in accordance with the provisions of the <i>Aboriginal Land Rights Act 1983</i> .	Pre-construction	Project Engineer / Site Engineer	Submissions / PIR (LU6)
LU7	A remnant land strategy to minimise land use severance and sterilisation, and a mitigation strategy for final land uses will be developed in consultation with cane industry stakeholders, Coffs Harbour City, Clarence Valley, Richmond Valley and Ballina Councils.	Pre-construction	Project Engineer / Site Engineer	Submissions / PIR (LU7)
LU8	Access to properties near construction works will be maintained, including where required for the movement of farm equipment and livestock between properties, unless otherwise agreed with	Construction	Construction Manager / Environmental Site Representative	Submissions / PIR (LU9)

Woolgoolga to Ballina CEMP

ID	Measure / Requirement	When to implement	Responsibility	Reference
	landowners.			
LU9	Where temporary changes to property access are required during construction, alternative access will be determined in consultation with affected property owners and tenants.	Construction	Construction Manager / Environmental Site Representative	Submissions (LU10) / PIR
LU10	There will be ongoing communication with local communities about changes to the local road network, including likely delays and disruptions and alternative accesses if required.	Construction	Construction Manager / Environmental Site Representative	Submissions (LU11) / PIR
Construction impacts to primary industry, including forestry, an agriculture uses				
LU11	Where possible, onsite reuse of any spoil is the preferred solution for managing the impacts, although alternative options for the reuse or disposal of spoil will be identified in the surplus material management plan.	Construction	Construction Manager / Environmental Site Representative	Submissions (LU12) / PIR
LU12	The management of surplus material will be further developed during detailed design, in consultation with relevant stakeholders. This will build upon the principles of the strategy described in Chapter 3 of the Submissions and Preferred Infrastructure Report (Roads and Maritime, 2013).	Pre-construction	Project Engineer / Site Engineer	Submissions (LU13) / PIR
LU13	Forestry Corporation of NSW will be able to harvest millable timber in affected State forests prior to works commencing. However, consideration will also be given to opportunities for the productive use of trees removed from non-State forest areas of the project, including ancillary facilities where necessary.	Construction	Construction Manager / Environmental Site Representative	Submissions (LU14) / PIR
LU14	Environmental management measures will be implemented to minimise potential for impacts on adjoining agricultural uses, including from changes in water quality and spread of weeds and pests.	Construction	Construction Manager / Environmental Site Representative	Submissions (LU15) / PIR
LU15	Where pesticides are required during construction, implement appropriate environmental management measures to avoid potential impacts on adjoining agricultural properties.	Construction	Construction Manager / Environmental Site Representative	Submissions (LU16) / PIR
LU16	There will be ongoing consultation and communication with managers of agricultural properties to identify any potential impacts on nearby construction workers from farm operations (ie use of pesticides on agricultural properties).	Construction	Construction Manager / Environmental Site Representative	Submissions (LU17) / PIR
LU17	Ongoing consultation and communication will be undertaken with commercial fishing and relevant aquaculture operators about construction activities within and near the Clarence and Richmond rivers. Stakeholders include the estuary prawn trawl fishery, and estuary general fishery within the Clarence River, the NSW Department of Primary Industries (Fisheries) and licensed fishing interests within the Richmond River regarding the timing and duration of construction, potential impacts (including changes to river access)	Construction	Construction Manager / Environmental Site Representative	Submissions (LU18) / PIR

Woolgoolga to Ballina CEMP

ID	Measure / Requirement	When to implement	Responsibility	Reference
and proposed mitigation measures.				
Utilities and infrastructure				
LU18	Relocation or adjustment of infrastructure will be planned to minimise disruptions and impacts on surrounding properties.	Construction	Construction Manager / Environmental Site Representative	Submissions (LU19) / PIR
LU19	Communication will be undertaken with nearby communities about the timing and duration of potential disruptions to infrastructure.	Construction	Construction Manager / Environmental Site Representative	Submissions (LU20) / PIR
Property management				
LU20	Roads and Maritime' land that is required for the project will be appropriately maintained. This will be undertaken by regional Roads and Maritime officers or a designated local authority. Roads and Maritime manage the leasing and maintenance of property identified as suitable for tenants.	Operation	Construction Manager / Environmental Site Representative	Submissions (LU21) / PIR
Operational impacts to primary industries				
LU21	Ongoing consultation will be undertaken with owners of agricultural properties affected by the project – through acquisition, changes to local access or fragmentation of properties – about potential impacts on farming operations and potential measures to manage or mitigate identified impacts.	Operation	Construction Manager / Environmental Site Representative	Submissions (LU23) / PIR
LU22	Consultation with Forestry Corporation will be undertaken regarding access to and within State forests where required, in accordance with the <i>Forestry Act 2012</i> .	Operation	Construction Manager / Environmental Site Representative	Submissions (LU24) / PIR
LU23	Consultation with Forestry Corporation will be undertaken regarding the relocation of fire trails directly impacted by the project's construction or operation.	Operation	Construction Manager / Environmental Site Representative	Submissions (LU25) / PIR
LU24	The Cane Farm Strategy will be further developed during detailed design, in consultation with relevant stakeholders. This will build upon the principles of the strategy described in Chapter 3 of this Submissions and Preferred Infrastructure Report.	Pre-construction	Project Engineer / Site Engineer	Submissions (LU26) / PIR
Property access				
LU25	As far as possible, property accesses will be reinstated or new access provided, in consultation with impacted landowners.	Operation	Construction Manager / Environmental Site Representative	Submissions (LU27) / PIR
LU26	Access to national parks and nature reserves will be reinstated in consultation with the relevant department in Office of Environment and Heritage.	Operation	Project Engineer / Site Engineer	Submissions (LU28) / PIR

ID	Measure / Requirement	When to implement	Responsibility	Reference
Mining and petroleum production				
LU27	Consultation will be undertaken with land owners operating quarries adjacent to the project, including those near Tucabia, Broadwater and Bagotville, and relevant NSW State government agency. Consultation aim to identify appropriate management measures for each affected quarry, particularly regarding operational approvals in terms of site access, extraction limits, blasting limits, and timing of works, noise and vibration.	Pre-construction	Project Engineer / Site Engineer	Submissions (LU29) / PIR
LU28	Consultation will be undertaken with the relevant State Government agency to consider any future coal seam gas production in the vicinity of the project.	Pre-construction	Project Engineer / Site Engineer	Submissions (LU30) / PIR
Utilities and infrastructure				
LU29	Consultation will be undertaken with service and utility providers to verify locations, impacts and any relocation or construction protection work required.	Operation	Construction Manager / Environmental Site Representative	Submissions (LU31) / PIR

Table 1-4 Social and economic management and mitigation measures

ID	Measure / Requirement	When to implement	Responsibility	Reference
SOCIAL AND ECONOMIC				
SE1	Consultation will be undertaken with local business owners, industry and tourism operators directly affected by construction and located closest to construction works. The focus will be on the timing, duration and likely impact of construction activities, to identify appropriate measures to manage potential impacts.	Pre-construction construction	and Construction Manager / Environmental Site Representative	Submissions / PIR (SE1)
SE2	Consultation will be undertaken with managers of community services and facilities near the proposed construction works, to ensure that potential impacts are appropriately managed.	Pre-construction construction	and Construction Manager / Environmental Site Representative	Submissions / PIR (SE2)
SE3	Consultation will be undertaken with residents and local communities closest to construction works about construction activities, including timing, duration and likely impacts.	Pre-construction construction	and Construction Manager / Environmental Site Representative	Submissions / PIR (SE3)
SE4	Roads and Maritime will work with Councils affected by the upgrade, where relevant, to support strategies by local councils and/or chamber of commerce and industry to promote townships and villages as stopovers for tourist.	Construction operation	and Construction Manager / Environmental Site Representative	Submissions / PIR (SE5)
SE5	Maintain access to properties near to the project during construction, including, where required, for the movement of farm equipment and livestock between properties, and for access to the Berry Exchange and other affected agribusinesses.	Construction	Construction Manager / Environmental Site Representative	Submissions / PIR (SE7)
SE6	Where temporary changes to property access are required during construction, alternative access will be determined in consultation with affected property owners and tenants.	Construction	Construction Manager / Environmental Site Representative	Submissions / PIR (SE8)
SE7	Undertake consultation with the Harwood Island Public School and other community facilities located adjacent to the project about proposed changes to local access.	Operation	Construction Manager / Environmental Site Representative	Submissions / PIR (SE9)
SE8	Undertake early and ongoing communication and consultation with emergency services to allow planning for potential changes to response patterns and input into the design development.	Operation	Construction Manager / Environmental Site Representative	Submissions / PIR (SE10)

2 Compliance management

2.1 Roles and responsibilities

The Golding Project Team's organisational structure and overall roles and responsibilities are outlined in *Section 4.2 of the CEMP*. Specific responsibilities for the implementation of environmental controls are detailed in *Chapter 1 of this Plan*.

2.2 Training

Details regarding staff induction and training are outlined in Chapter 5 of the CEMP.

2.3 Monitoring and inspection

Regular monitoring and inspections will be undertaken during construction.

Additional requirements and responsibilities in relation to inspections, in addition to those in Table 1-1, are documented in *Section 8.2 of the CEMP*.

2.4 Auditing

Audits (both internal and external) will be undertaken to assess the effectiveness of environmental mitigation and management measures, compliance with this sub plan, CoA and other relevant approvals, licenses and guidelines.

Audit requirements are detailed in *Section 8.3 of the CEMP*.

2.5 Reporting

Reporting requirements and responsibilities are documented in the *Sections 8.3, 8.4 and 8.5 of the CEMP*