NSW EPA

Your reference: SSI-4963
Our reference: DOC13/91466
Contact: Robert Donohoe, (02) 6640 2518

12 DEC 2013

Ms Kylie Seretis
Manager – Roads, Infrastructure Projects
Department of Planning
GPO Box 39
SYDNEY NSW 2001

Dear Ms Seretis

Pacific Highway Upgrade – Woolgoolga to Ballina Project (SSI-4963) – Exhibition of Preferred Infrastructure Report

I refer to the Preferred Infrastructure Report (PIR) for the Woolgoolga to Ballina Pacific Highway Upgrade Project, and accompanying appendices, received by the Environment Protection Authority (EPA) on 20 December 2013. Thank you for the opportunity to provide comments on the Woolgoolga to Ballina PIR.

The EPA and Office of Environment and Heritage (OEH) have reviewed the information provided in the PIR and accompanying documents. The EPA notes and appreciates the additional detail provided in the PIR documents, particularly in relation to the mitigation and management provisions.

This submission identifies issues where additional detail or correction is requested, and then focuses on providing the Department of Planning and Infrastructure (DP&I) with recommended conditions of approval to address these issues.

Detailed comments and recommended conditions of approval, from both EPA and OEH are provided in the various attachments to this letter, as follows Attachment 1 (EPA Project Noise & Vibration Comments), Attachment 2 (EPA Biodiversity Comments), Attachment 3 (NPWS Park Estate and Biodiversity Related Comments) and Attachment 4 (OEH Aboriginal Cultural Heritage Comments).

The EPA is satisfied that the PIR as it currently stands has appropriate provisions to adequately mitigate and manage air quality related issues, water quality outcomes and erosion and sediment control over the construction phase of the project. No further comments have therefore been provided in relation to these issues at this stage of the process.

Detailed comments have been provided in relation noise, vibration and biodiversity management. In relation to each of the issues raised a recommended condition of approval or comment regarding the content of a condition of approval is provided.

Based on this assessment of the PIR, the EPA has determined that it is able to support the proposal, subject to any recommended conditions of approval addressing the issues raised in this letter.

As previously advised, in relation to the information provided in the PIR, it is noted that the proposal, if approved, will require an Environment Protection Licence as these activities are scheduled under the provisions of the *Protection of the Environment Operations Act 1997* (POEO Act). The proponent will need

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to make a separate application to the EPA to obtain this licence prior to the commencement of any scheduled activities.

If you have any questions, or wish to discuss this matter further please contact Robert Donohoe (6640 2518).

Yours sincerely

BRETT NUDD
Manager North Coast Region
Environment Protection Authority

Attachment 1: EPA Noise and Vibration Comments

Attachment 2: EPA Biodiversity Comments

Attachment 3: NPWS Park Estate and Biodiversity Related Comments

Attachment 4: OEH Aboriginal Cultural Heritage Comments

Attachment 1 – EPA's Noise and Vibration Comments .

The Environment Protection Authority (EPA) has reviewed the '*Pacific Highway Woolgoolga to Ballina Upgrade – PIR, including Appendix F Revised Operational Noise Assessment and Appendix H Changes made to the Mitigation and Management Measures of the Proposals EIS.*

The review has **confirmed that the EPA continues to have no significant concerns** in relation to the proponent's assessment outcomes and proposed commitments to mitigate and manage the project's noise and vibration.

In relation to the Lang Hill site that is to be utilised as a quarry resource, a review of Appendix G Lang Hill Environmental Work Method Statement (EWMS), notes that blasting will be required with two sensitive receivers identified as being impacted by these activities.

As acknowledged in the EWMS, it will be critical to have sufficiently robust sensitive receptor and community consultation commitments in the project's Construction Noise and Vibration Management Plan and Community Communications Strategy to enable alleviation of impacts to affected receptors both at sites such as Lang Hill and across the broader project.

EPA considers that any blasting should be assessed in detail against ANZECC guidelines. It is acknowledged that the blasting management measures identified at CNV18 to CNV31 under Appendix H will predominantly ensure appropriate mitigation and monitoring provisions are implemented by the proponent.

The EPA acknowledges the increased commitments to mitigate and manage the project's noise and vibration impacts as identified in Appendix H. The EPA, however, reiterates that the implementation of the Construction Noise and Vibration Management Plan referred to in Section 3.3.4 of the EIS WP will not, in many cases, be able to reduce the impacts from the works to a level that approaches the relevant construction noise and vibration goals. This increases the relevance of a rigorous community engagement strategy and consideration of enhanced at receptor mitigation treatments where relevant.

As previously advised, the key construction noise issues which will need to be managed in seeking to comply with the relevant construction noise and vibration goals will be:

- effective communication with and management responses to the concerns of the affected community;
- the need for clear justification, clear community support and prior approval to carry out any construction works outside the recommended standard hours defined in Section 2.2 of the Interim Construction Noise Guideline (ICNG), including the adoption of the proposed construction hours (6am to 7pm Mon-Fri, 8am to 5pm Sat);
- the early erection of temporary and, where possible, operational noise barriers and/or other mitigation measures;
- the need to minimise any construction traffic movements outside standard hours, and particularly at night time (10pm to 7am), to reduce the potential for sleep disturbance as much as possible; and
- the need to carry out an assessment of the potential noise and vibration impacts from blasting, and a strategy to minimise and manage those impacts.

Suggested Conditions of Approval – Noise and Vibration and Hours of Operation

1. In relation to the Department of Planning and Infrastructure's (DP&I) approval conditioning of this project, the EPA suggests that the Nambucca Heads to Urunga (NH2U) Pacific Highway project's conditions of approval under the heading **"Construction Noise and Vibration Goals"** C7 to C11 provides a satisfactory framework for both the proponent and agencies to manage through the construction phase of the proposal.

2. Similarly, the EPA suggests the adoption of the NH2U projects conditions of approval under the heading **"Construction Hours"** C3 to C6 noting that the W2B projects proposed Mon to Friday construction hours are to be 6am to 7pm. In particular condition C4 for the NH2U project would appear to be an opportunity for this proposal to effectively undertake works in remote locations.

NSW EPA

Attachment 2 – EPA's Biodiversity Comments

Reference	EPA comment	RMS Response
Appendix J Page 40 site 6	The EPA does not support the use of an ancillary facility at 'site 6' as this area is located in a priority koala movement corridor. Following recommendations from the *2010 Clarence Valley Council Biodiversity Management Strategy,* the 'Bundjalung National Park – Woombah – Ashby Link' is identified as one of three critical koala movement pathways within the Local Government Area. Most importantly this corridor links old growth coastal remnants at Iluka via coastal lowlands which follow the Clarence River valley to the coastal ranges. This movement corridor is fragmented and is therefore classified in the Council document as a stepping stone corridor. Consequently it has been nominated by Council as a priority area for restoration and conservation planning. There are recent koala records immediately east and west of the proposed alignment at this location which confirms the value of the corridor. Consideration also needs to be given to the value of maintaining this corridor at a landscape level to enable dispersing koala access to fragmented habitat between sub-populations. It is important to note that the Iluka koala population is at risk from wildfire events which further add weight to the importance of maintaining potential re-colonisation movement corridors from nearby koala populations to the west. The Pacific Highway Upgrade will create a significant barrier to koala movement at this location and enhanced connectivity for koalas at this location is required. Recommended MCoA: **Between Ch95.7 to Ch97.1 identify and implement enhanced connectivity structures for koalas, in consultation with the EPA. This must include consideration of a wildlife landbridge of sufficient dimension (width) to provide adequate connectivity functionality.** The PIR also identifies 'site 6' as a potential site for vegetation rehabilitation post-construction. The EPA supports rehabilitation of this RMS owned land with a focus on providing primary koala feed trees from the local area.	
Appendix J Page 75	The EPA seeks clarification of the following statement: *"that the gullies and creeks at this location (Arrawarra Creek and Arrawarra Gully) are only marginal for the Giant Barred Frog (Lewis 2013) and the species was not confirmed"*. This statement is contradicted by evidence of a persistent Giant Barred Frog population in Arrawarra Creek. Recent (Autumn 2013) monitoring data from the Sapphire to Woolgoolga Pacific Highway Upgrade (*Benchmark Environmental Management, 2013*) also confirms adult and tadpole Giant Barred Frog individuals at this location. Whilst it may not be optimal habitat at this location (following literature) it has evidently remained continuously	

	occupied as have other 'sub-optimal' sites on the Sapphire to Woolgoolga Pacific Highway Upgrade (and other Pacific Highway Upgrade projects). The EPA believes that the presence of this species was underestimated during environmental studies for the Sapphire to Woolgoolga project and is also currently underestimated in studies for the Woolgoolga to Ballina project. This view is supported by the fact that Giant Barred Frog individuals were detected in Dirty Creek as a result of additional survey work undertaken by RMS during investigations for a proposed design refinement. In addition targeted threatened fish surveys at Halfway Creek also opportunistically revealed the presence of Giant Barred Frog tadpoles – implying a breeding population is present. Recommended MCoA: **Targeted surveys for Giant Barred Frog are undertaken during ideal detection periods in areas of optimal and sub-optimal habitat. Where Giant Barred Frog is located an assessment of habitat connectivity will be undertaken and appropriate measures developed in consultation with the EPA to mitigate the highway barrier affect.**	
Appendix J Page 87	The length of the culvert at **Ch20.88** has increased from 43m to (around) 60m due to an increase in fill height. The EPA recommends the height of the culvert is subsequently increased from 2.4m to 3m to improve and/or maintain its functionality following this increase in length. The EPA is involved in the detailed design refinement stage for all Pacific Highway Upgrade projects. Where a structure is proposed in the EIS it is assessed by the EPA on its merits to mitigate the barrier impact; however, subsequent changes in final design often result in structural dimensions that fail to provide effective fauna connectivity mitigation. To overcome this issue the EPA recommends a stronger commitment is made and suggests the following condition of approval. Recommended MCoA: **Limit design changes to both dedicated and combined fauna connectivity structures of no more than 5% in length. In the event that design changes are greater than 5% the EPA recommends that there is a corresponding increase in culvert height (to length) to maintain effective habitat connectivity.**	
Appendix J Page 96	The EPA recommends relocating the southbound Pine Brush rest area 200m further north to improve access by the endangered coastal emu population that may utilise the overpass at this location. The emu connectivity strategy currently relies on the efficacy of the low level bridges over waterways to provide habitat connectivity and if this fails the various overpasses on the project may present the only viable crossing option.	
Appendix J Page 383	This list should be amended to include a commitment to construct and enhance overpass structures in sections 3 and 4 if the bridges fail to provide emu habitat connectivity (refer recommended MCoA). See comments on the Emu Management Plan for specific recommendations relating to provision of overpasses.	
Appendix J Page 390	The EPA acknowledges and supports the additional assessment and design improvements specifically relating to koala mitigation in the Wardell Heath area. The importance of maintaining a functional koala movement corridor in this area between the east and west of the highway cannot be understated as is supported by comments in the EIS and local government data (*Koala Habitat and Population Assessment: Ballina Shire Council, Biolink December 2013*). However the EPA does not support the current level of proposed mitigation and the deferral 'to investigate connectivity improvements' during detailed design. Consequently an alternative approach is recommended by the	

	EPA, as detailed in the following MCoA: • **The fauna connectivity structure at Ch156.3 is increased in height from 1.2m to 3.0m and is no longer than 52m in length.** • **The fauna connectivity structure at Ch156.9 is increased in height from 1.2m to 3.0m and is no longer than 53m in length.** • **The fauna connectivity structure at Ch157.1 is increased in height from 1.8m to 3.0m and is no longer than 59m in length.** • **The fauna connectivity structure at Ch157.6 is increased in height from 1.2m to 3.0m and is no longer than 50m in length.** The EPA believes improvements at these specific locations in combination with the current proposal will provide adequate opportunity for dispersing koalas to connect with habitat on both sides of the proposed alignment in section 10.	
Appendix J Page 397	The following statement from the EIS *"It would therefore be considered appropriate in this context to consider the shortfalls identified above, with a view to adding additional structures during detailed design where feasible and reasonable"* requires firm commitment in the form of a **project approval condition**. This additional commitment should also be included in the supplementary mitigation list on page 449. The EPA agrees with the identified likely shortfall in arboreal connectivity and recommends the proposed targeted glider surveys are further supplemented with additional survey and assessment work to identify these shortfalls and identify additional structures/measures to address these shortfalls. Further specific comments and recommendations are provided in EPA comments on the Threatened Glider Management Plan.	
Appendix H section 3.2.1	The EPA is seeking clarification as to whether this draft Strategy was developed solely to address Matters of National Environmental Significance (MNES). From the EPA's review it appears as though this Strategy was written to only address impacts to MNES. The document appears to be driven by the requirements of the Department of Environment's Biodiversity Offset Policy and Principles, and does not appear to address state requirements and impacted species. This version of the Biodiversity Offset Strategy no longer recommends applying the previously agreed 4:1 offset ratio applied to impacted areas when calculating the quantum of offset required. Section 3.2.1 proposes to identify the *"size of offsets required"* but this calculation has only been estimated for MNES and disregards the commitments made in previous draft Biodiversity Offset Strategy estimates The recently approved Oxley Highway to Kempsey Biodiversity Offset Strategy proposes the simple application of a 4:1 offset ratio for all native vegetation impacted. A blanket 4:1 ratio was proposed by the RMS in acknowledgement that all remnant vegetation represents high conservation value as either an EEC, threatened species habitat or as a wildlife movement corridor. Application of a 4:1 offset ratio for all impacted vegetation removes the need to separate threatened species habitat and EEC from non-EEC vegetation and from non-EEC vegetation in moderate to good condition that is likely to support threatened species. This complex calculation was required for the Warrell Creek to Urunga Biodiversity Offset Strategy and would be difficult to implement for the Woolgoolga to Ballina project without adequate threatened species habitat condition and extent mapping. In order to simplify the offsetting process the EPA would support a MCoA, which required all native vegetation to	

	be offset at a ratio of 4:1:.	
Appendix H Section 5.3	OEH offset principles for major projects 'principle number 3' requires the proponent to target offsets that include the impacted threatened species and their habitats. Therefore the proponent should demonstrate the presence of the nominated impacted threatened species at each proposed offset site. This is a similar requirement to commonwealth impacted species. OEH offset principles for major projects 'principle number 5' requires suitable offsets to be determined prior to approval. There is a similar requirement at a commonwealth level. The EPA acknowledges that RMS has undertaken considerable work in the area of identifying suitable lands for offsetting purposes and will be further developing the projects offset deliverables over the next 12 months. The EPA suggests that the project's offset commitment need to be further formalised through a MCoA which includes offsetting timelines, processes, principles and extent of offset per impacted community.	
Appendix H General comment	The EPA is aware of the advantages to the RMS in securing offset land adjacent to the new alignment. However the location of these parcels of land typically compromises their value as offsets as follows: • High level of disturbance and edge effects from the new highway. • Lack of connectivity east/west (which is inconsistent with the Offset Strategy section 6.2 Decision making framework – *"Offset land would comprise land that enables connectivity between adjacent areas of vegetation, where possible").* • Potential changes in habitat values resulting from the highway eg/ loss of Hollow Bearing Trees, changes in species composition due to changes in hydrology and loss/increase of herbivore grazing pressure and potential increase in predators. The EPA therefore recommends that offsets shouldn't be located immediately adjacent to the highway, unless RMS can demonstrate that an offset property immediately adjacent to the highway meets the project's offset strategy.	
Appendix K Ecological Monitoring Program Page 7	*"Ensure that the location of any threatened flora species, threatened ecological communities and habitat are mapped".* The EPA offers the following comments regarding this statement: • It is acknowledged that EEC mapping is refined during the detailed design process (just prior to construction) and is invariably different from the low resolution mapping in the EIS. This refined EEC layer is captured for every Pacific Highway Upgrade project and should be routinely reported and assessed against estimates in the EIS and included in updates in the relevant biodiversity offset strategy. The EPA recommends a simple tracking process is implemented to capture this data. • The EPA is aware that RMS has engaged ecologists to undertake further threatened species habitat surveys along the project route to inform mapping records and mitigation and management frameworks for the project. This is supported by the EPA. Recommended MCoA: **Where the proponent undertakes further ecological surveys to inform mapping, design, mitigation and management for the project, any survey information that is likely to significantly change mitigation and management approaches, is forwarded to the Department of Planning and Infrastructure for assessment and any necessary consultation**.	

	• Figures 2-1 to 2-11 in the Threatened Mammal Management Plan are titled *'Threatened mammal records, predicted habitat and connectivity structures'* however these maps illustrate vegetation communities. Therefore, it is assumed these vegetation surveys are synonymous with known and likely habitat. In the absence of survey data the EPA has confirmed with RMS that its position is to assume threatened species presence and be considering appropriate mitigation measures. EPA notes that the additional survey effort referred to above will further positively inform and refine this position.	
Appendix K Ecological Monitoring Program Page 8 Section 2.1.2	The EPA recommends hollow bearing trees are retained for at least 48 hours after stage 1 works. There is no evidence to support success of a shorter retention period.	
Appendix K Threatened Mammal Management Plan Page 8	Please note, the Long-nosed Potoroo may not be restricted to wet and dry heath on sandy soils habitat. The vegetation throughout the Wardell heath area is diverse and the Long-nosed Potoroo population is seemingly abundant in this restricted remnant. Recent camera baiting surveys (commissioned by *Ngunya Jargoon Indigenous Protected Area*) revealed presence of Long-nosed Potoroos and their young at three out of four camera stations. Similar high yielding surveys were completed by OEH researchers (*Distribution of the Long-nosed Potoroo, OEH, 2012*). This data suggests that all potential potoroo populations fragmented to the west of the alignment will very likely become isolated from the larger remnant. Also the 10ha directly impacted by highway construction is likely to contain the Long-nosed Potoroo therefore targeted surveys are recommended in these areas.	
Appendix K Threatened Mammal Management Plan Page 14 and 22	*"Impacts on known roosting habitat or a roosting colony have not been identified and no artificial roost sites have been identified at this stage of the project despite targeted surveys".* The EPA recommends that further assessments to clarify the impacts to threatened microbat habitation in culverts and bridges proposed for replacement during the upgrade is required. The targeted surveys mentioned above only assessed two structures - representing a small percentage of the total number of structures to be impacted by the upgrade. It would appear that RMS is proposing to use more intrusive measures to remove microbats from structures despite the opportunity to plan year(s) in advance. The EPA recommends microbat mitigation measures should be developed and implemented at least 12 months in advance of the disturbance. The success of microbat management strategies relies on providing artificial roosts which cannot by achieved following the current late stage management proposal. Page 400 of Appendix J highlights the success of the bat box replacement strategy on the Tintenbar to Ewingsdale Pacific Highway Upgrade project. The reason for this success is likely to be that bat boxes were established 9 months prior to disturbance. Recommended MCoA: **A microbat management strategy is developed for each project stage, including the installation of alternative roost boxes 12 months prior to the disturbance taking place.**	
Appendix K Threatened Mammal Management	*"Targeted surveys would be undertaken in the pre-construction phase to further inform the management plan by confirming the presence of threatened mammals, collect baseline population data, habitat quality information and identify ongoing monitoring locations for the threatened mammals detailed in this plan. This survey would be undertaken pre-construction within known and likely habitat....."*	

Plan Page 18 Section 4.3	The EPA notes that the above statement commits the RMS to undertaking targeted surveys in likely habitat to identify the need to refine and/or *add* connectivity structures. If so this represents a very large percentage of the entire footprint for each threatened mammal (see comments above regarding assumption of presence). The approach utilised in the previous EIS draft resulted in connectivity structures in areas of potential habitat. The EPA would seek to be consulted if the findings from any targeted surveys result in significant changes to the projects fauna connectivity structure designs, mitigation strategy or management provisions outlined in this current PIR revision. Also note that the proposed surveys will not provide baseline population data but rather an estimate of relative density (which is suitable for this purpose). Further to this discussion, Table 4-1 describes a performance indicator goal as the "*confirmation of important habitats for threatened mammals prior to commencement of construction*". This process needs to be defined to adequately clarify the intent ofwhat appears to be a 'once only' survey, including further defining the criteria that establishes '*important habitat*'. The EPA expects that this data is also likely to be useful to refine the mapped areas of known threatened species for EPBC offset calculator purposes. The EIS has captured important ecological data at a very low resolution over an expansive area and deferred the refinement of mitigation to preconstruction targeted surveys. Not only is this approach presented throughout the body of the EIS but is also highlighted by the DP&I commissioned independent review and opinions of experts in their various peer reviews (Appendix K). The proposed targeted surveys must clearly identify the objective is 'to conduct surveys where there are gaps in areas of known or likely habitat and the results will trigger the need for an assessment of habitat connectivity requirements'. Section 7.2.3 recommends that it "*would be optimum to conduct two surveys as the baseline prior to construction and then continue with biannual surveys.*". The EPA believes two surveys over a period of 12 months would be sufficient to target under-surveyed areas of suitable habitat and to establish sub-population presence/relative density. Recommended MCoA: **The proponent must undertake targeted surveys of threatened species in areas of known or likely habitat to assess the adequacy of proposed mitigation measures. If additional sub-populations are located the proponent will refine or provide additional connectivity structures following the agreed design principles from the EIS.**	
Appendix K Threatened Mammal Management Plan 7.2.3	This section of the EIS proposes biannual monitoring for five years starting from the baseline preconstruction surveys. Given these surveys are required at least 12 months prior to construction and construction will take at least four years this leaves no opportunity for operational monitoring. The EPA recommends operational surveys are conducted every two years over an eight year period to capture long term trends. Also, for most species of concern, there is little value in surveying over the period of construction.	
Appendix K Threatened Mammal Management Plan 7.3.3	The EPA agrees that success of the crossing structures will be proven if it meets the design objective over three consecutive monitoring periods (consisting of two events each). However the current performance threshold states that this could equate to a single use of the structure, or multiple uses by the same individual. The EPA believes the performance threshold should relate to the survival of the adjacent fauna population or potentially the measure of relative density For example if monitoring reveals an adjacent population crash (relative to control populations)	

	and the structure has not been used by the adjacent population this should be seen as a mitigation fail and require instigation of contingency plans. If monitoring over an eight year period is undertaken, there will be sufficient opportunity for revegetation to establish and local populations to recover and familiarise with the new highway environment and connectivity structures. The altered environment will re-establish a new 'baseline' population and it is this re-established population that requires ongoing access to habitat to remain viable in the long term. Therefore the EPA proposes an ecological monitoring approval condition that: **measures the success of the connectivity structure relative to the population density of the adjacent population.** The EPA has also observed that initial investigation and use of fauna passage may occur prior to monitoring taking place. This is also a period of high fauna mortality from vehicle strike. The EPA encourages initial monitoring to take place during the first high detection season immediately following completion of construction rather than waiting six months.	
Appendix K Emu Management Plan Page 4 CeMP2	The adoption of the recommended rabbit proof fencing is not supported by the EPA. Adoption of this type of fence is also inconsistent with all other references to emu fencing and fencing trials in the EIS (other than a single reference to a raised Glenugie style fence). The EPA is willing to include this style of fencing in emu fencing trials however it is recommended that the current 1.8m chain mesh floppy top exclusion fencing is predominantly used. Please note that Dr Stephen Davies' recommendations solely consider emus and will not be effective in excluding koalas and Brush-tailed Phascogales. A barbed wire strand on top is also detrimental to gliders that will invariably attempt to glide the span of the highway.	
Appendix K Emu Management Plan Page 17	*"If during the operational phase emus are found to be unable or unwilling to use designated crossing structures provisional options would be developed that could be implemented if research and/or monitoring identify that additional or alternative measures are required".* At present the performance measures and corrective actions triggering construction of additional emu crossing structures and/or modifying existing overpasses is not clearly articulated. Nor is it triggered until five years of 'nil' emu movement across the project (post construction) has elapsed. The current connectivity goal could equate to as little as a single crossing of an individual emu in this five year period. It is also suggested that if emus do not cross the project during construction it would be less likely that they will once the road is operable. Rather than waiting up to nine years (four years construction + five years post) before implementing contingency measures the EPA recommends that the need for additional mitigation (ie. additional overpass structures and/or existing overpasses widened to accommodate emus) is triggered if no emus traverse the project during construction or the first two years of operation. The EPA recommends that this trigger is confirmed in the MCoA. At this point in time it is unknown if emus will cross the project once construction begins. If emus do continue to cross the project during construction careful note should be taken of the location, direction of travel, the time of year and the number of individuals as this should be considered as a new 'baseline' for future movement comparisons. It would be reasonable to use this figure as the baseline for future evaluation of crossing structures across the project rather than a single successful complete passage (as is currently proposed). *"The location of additional measures is still to be decided based on further inputs from the monitoring program and*	

discussions with the agencies, It is noted that there is a commitment to include an additional structure somewhere between Wooli Road and Sommervale Road in Section 3, subject to further population monitoring".

The EPA agrees that plans should be made now to incorporate an additional emu overpass and to modify the following two structures if monitoring results trigger the need for additional mitigation:

- Firth Heinz Road overpass **ch51.86**
- Bostock Road overpass **ch55.499**.

The EPA considers that the RMS proposed contingency emu overpass structure at **ch48.300** is inappropriately situated between two hill crests.

The EPA is concerned that reliance on overpass construction and modification will not be feasible once the highway is operable. The EPA has raised this issue previously with RMS in an attempt to better understand the impediments and disruptions to undertaking the installation of an overpass post-construction. It is preferable that RMS considers further targeted and refined surveys in these locations and a design decision is made pre-construction to install an overpass in a suitable emu movement location.

However if RMS proposes to continue with the construction/post-construction mitigation decision making option the following is suggested:.

In summary the EPA proposes the following recommended MCoAs:

1. **If during construction or in the first two years of operation emus do not cross the project in both directions, this will trigger the construction of additional overpass measures.**

2. **If overpass construction is triggered the RMS will construct/modify the three overpasses to at least 50m wide consisting of low height emu habitat and separated low speed vehicle traffic.**

<u>Additional emu offsets</u>

As an alternative to the RMS proposal the EPA recommends (MCoA) **provision of additional targeted emu offsets** if the following conditions are met:

- if after five years post construction there is little or no complete passage of emus across (including over and under) the new road,

- and/or monitoring reveals the emu activity levels are declining by more than 15% compared to 'prior to construction' baseline studies.

Targeted offset funding should also be provided to fund priority actions identified in the Endangered Emu Population in the NSW North Coast Bioregion and Port Stephens Local Government Area Priority Action Statement. This document is currently being developed by OEH, with its availability likely to coincide with the

	timing of this project's approval decision..	
Appendix K Emu Management Plan Page 24 section 5.3.1	The EPA review has indicated there is an absence of management provisions in the event that an emu nest is found within or adjacent to the project boundary? It is recommended that a MCoA require the development of a strategy to deal with this potential occurrence, in consultation with local wildlife carer, Kerry Crannie.	
Appendix K Threatened Frog Management Plan Page 1-1	This plan seems to have omitted consideration of the threatened Wallum Froglet due to it being deemed not to be at great risk from the project. The EPA would like to see further consideration of the Wallum Froglet in this plan (refer MCoA below).	
Appendix K Threatened Frog Management Plan Page 4-1	As previously discussed during comments on Appendix J the EPA agrees with the following statement relating to the objective of targeted frog surveys – *"The targeted surveys would therefore aim to firstly identify the location of threatened frog populations for each upgrade section, and identify and map known and potential habitat for the target species".* To achieve this aim the EPA recommends the following MCoA: **Targeted surveys for threatened frogs are undertaken during times of maximum (seasonal and weather related)detection periods in areas of optimal and sub-optimal habitat that have not been surveyed to date. Where threatened frog sub-populations are located an assessment of habitat connectivity will be undertaken and appropriate measures developed to mitigate the highway barrier affect.** The targeted survey results will provide insights into habitat utilisation, the size of the sub-population and therefore the habitat connectivity requirements. The EPA maintains that there is no evidence to suggest that any Australian frog will completely traverse structures under roads other than bridges. This view is supported by the expert review.	
Appendix K Threatened Frog Management Plan Page 7-3	*"Control sites would be locations along the road where there are no crossing structures".* The EPA recommends that wherever a sub-population of a threatened frog occurs it should likely have access to a habitat connectivity structure. The EPA expects control sites to be in suitable locations that have no interactive relationship with the highway project given that they are to be used to assess local populations unaffected by highway upgrade activities. The following statement *"Monitoring of control sites would use broadly the population survey methods outlined in section 7.2. As frogs would be unlikely to be calling from connectivity structures, active searching of these structures would be required"* implies that there will be culverts at control sites. See comment above regarding the location of control sites.	
Appendix K Threatened Glider Management Plan Page 11	The EPA understands that there will be three separate targeted glider surveys prior to construction? • The first round of surveys will be undertaken for pre-clearing and clearing surveys to inform CEMP/EMP provisions, • The second round of surveys will target gliders in areas of known and potential habitat to refine and identify the need for additional arboreal crossing structures, and	

	• The third round of surveys to establish population baseline and begin monitoring. Discussion on targeted surveys on page 16 states that targeted surveys will only occur where glider mitigation is currently proposed. This will be useful to refine the location of mitigation measures. As highlighted in the independent review there are only 20 crossing structures proposed over the project length of 155km. Each arboreal crossing structure is likely to be dominated by a family group hence this is likely to restrict broader use. This is very unlikely to sufficiently break the barrier effect for the majority of the 155km. To address this issue the EPA provides the following recommended MCoA: **Undertake targeted glider surveys in all areas of potential habitat (including fragmented linkages) that have not yet been surveyed to inform an assessment of the adequacy of the concept arboreal mitigation strategy. If the assessment reveals inadequate provision of mitigation the RMS shall provide crossing structures within a crossing zone at each location.**	
Appendix K Threatened Glider Management Plan Additional comments	The EPA has observed impacts to widened medians on projects recently constructed that restrict their effectiveness. This is due to a number of reasons but namely placement in the widened median of temporary and permanent basins, temporary uses such as stockpiles, compounds, storage and compulsory tree removal for drainage, fencing and safety concerns. The EPA recommends that widened medians are protected from these obstructions in order to maintain their intended purpose, i.e. glider tree retention. Clearing gaps between trees should be no wider than 40m. A typical glide distance for Squirrel Gliders in northern NSW is 23m (*Goldingay and Taylor, 2010*). Gliders are likely to attempt to glide between trees over distances greater than this however there will be an unknown point at which gliders will not attempt to glide irrespective of tree heights. Successful glider mitigation using retained trees on the Hume Highway does not exceed 40m and glider expert, Kylie Soanes from Melbourne University, recommends canopy gaps of no greater than 35m. Arboreal mitigation structures have had limited success in providing complete passage for Squirrel Gliders. To date there are no recorded crossing on rope bridges greater than 75m in length. Please note, the EPA also supports the provision of 'crossing zones' which consist of at least a mixture of rope bridges and glider poles. This is to cater for a greater number of glider family groups and to allow for error in placement or other unknown factors limiting use (it is noted that the majority of rope bridges used in south east Australia have either not been used or show very little use by the target species due to the factors alluded to above). In summary the EPA recommends the following three MCoAs; 1. **Where practicable remnant vegetation in widened medians will be retained throughout construction.** 2. **Canopy gaps associated with widened medians will be no greater than 40m between the median and the road verge.** 3. **Rope bridges will be no greater than 75m in length. Distance between glide poles will be no greater**	

	than 40m.	
	EPA Flora and Invertebrate Review Comments	
Appendix J Section 3.14. Pages 119-121	The EPA notes the relocated southbound rest area is on and/or located immediately adjacent to land which is currently being rehabilitated to satisfy Conditions of Consent in relation to Ballina Shire Council concerns. The EPA notes that this project proposal requires the subject rehabilitation area to be protected in perpetuity. Consequently, the proposed rest area should be suitably positioned so that it does not impact on this existing offset area.	
Appendix J Pages 130, 212 and 217 Table 3-21	The PIR indicates that the project will impact on 2.5ha of state listed Lowland Rainforest EEC, while Table 4-1 of the Lowland Rainforest and Threatened Rainforest Plants Management Plan (LRTRPMP) indicates that 4.2 hectares of Lowland Rainforest will be directly impacted by the project. The Littoral Rainforest estimates of 0.23 hectares are also contrasted against the 0.5 hectares reported in Table 4-1. The number of threatened plants directly impacted by the highway upgrade in Table 3-21 is inconsistent with Table 4-2 of the LRTRPMP The EPA recommends that RMS reviews the PIR and attachments to correct these references to ensure consistency throughout the PIR and any subsequent documents.	
Appendix J Page 136	**Key Issue** The EPA supports RMS's intention to revegetate the approach to the fauna bridge located at Wardell. However, the size and extent of the proposed revegetation enhancement program remains unknown. The EPA also agrees that the area is an "*important north-south regional link in the landscape*". Consequently, to increase the likelihood that the target fauna species will utilise the fauna connectivity structure, the EPA suggests that revegetation works in this area should be maximised, including considering the cleared pasture land to the south of the highway. While the PIR indicates this area will be revegetated during construction, the EPA notes this commitment is partially compromised given the land immediately adjoining the land bridge is likely to be impacted by a proposed ancillary site. The EPA also considers security lights associated with the ancillary site have the potential to have a adverse ecological impact on the Southern Pink Underwing Moth (*Phyllodes imperialis southern subspecies*) and Atlas Rainforest Ground-beetle. Given the above issues, the EPA recommends the relocation of the ancillary site to assist in mitigating adverse impacts to invertebrate species and the functionality of the fauna bridge.	
Appendix J Chapter 6.2	This section of the PIR identifies that edge effects occur to a depth of 30 metres. The EPA notes the EIS identified that edge effects occur to a depth of 50m (refer page 27 of LRTRPMP). In the absence of any supporting evidence and for project consistency purposes the EPA suggests that the original edge	

	effect provision of 50m is adopted. If it is agreed that 50m is the most appropriate measure the edge affected calculations will need to be revised. The abovementioned reduced edge effect calculations are also expected to affect the Biodiversity Offset calculations identified in Chapter 8 of Appendix J.	
Appendix K	**Key Issue** The EPA notes the current EEC Management Plan (MP) has only been prepared for Lowland and Littoral Rainforest EEC. The EPA is of the view MPs should be prepared for the range of other state significant EECs which are known to be impacted by the Project. It is also recommended that all MPs prepared for the project should be directly linked to the overall Construction Flora and Fauna Management Plan as has been undertaken under MCoA B31(b) of the Warrell Creek to Urunga Highway Upgrade. **Recommended MCoA** Where the following EEC communities are directly or indirectly impacted by the project, the proponent must prepare an Endangered Ecological Community (EEC) Management Plan for each community : Coastal Cypress Pine Forest, Subtropical Coastal Floodplain Forest, Freshwater Wetlands, Swamp Sclerophyll Forest, Swamp Oak Floodplain Forest.	
Appendix K Ecological Monitoring Program (EcMP)	The EcMP only proposes to monitor and control noxious weeds. This approach is inconsistent with *Guide 6: Weed Management* of the *Roads and Maritime Biodiversity Guidelines, Protecting and managing biodiversity on RTA projects* (RTA 2011). Consequently, this section of the EcMP needs to be revised.	
EcMP Page 20	The EcMP only proposes to monitor and control noxious weeds. This approach is inconsistent with *Guide 6: Weed Management* of the *Roads and Maritime Biodiversity Guidelines, Protecting and managing biodiversity on RTA projects* (RTA 2011). Consequently, this section of the EcMP needs to be revised.	
Appendix K Lowland Rainforest and Threatened Rainforest Plants Management	The EPA considers that the current version of the LRTRPMP provides a rigorous approach to the management of the subject vegetation communities. However, it is considered the subject MP needs further refinements based on the expert review recommendations. Some of these issues are discussed in the following text. The EPA notes that a range of key recommendations provided by the expert review have not been finalised and included into the current version of the LRTRPMP. In particular, the EPA is of the opinion the experts recommendation RCMP 12, 16, 26 36, 43, 49 and 52 should all be addressed in the final	

Plan (LRTRPMP) Pages 5-11	version of the plan and suggests a MCoA to confirm this requirement.	
LRTRPMP Figures 2-3 and 2-4	The distribution of threatened plants is not consistent with the earlier April version of the LRTRPMP. This may directly affect the threatened species calculations detailed in Table 4-2. Revision of this information is required.	
Section 4.1	Section 4.1 identifies that edge effects occur to a distance of 20 metres. See EPA comments above regarding our preferred position on the assessment of edge effects.	
LRTRPMP Sections 4.2.1 and 4.2.2 and Table 4-1	Does not identify the areas of rainforest EEC indirectly affected by the highway upgrade. As previously mentioned edge effected calculations should be based on the original distance of 50m.	
LRTRPMP Section 4.4	States "*Lowland Rainforest impacted to three hectares and reduced the areas of Littoral Rainforest impact from 0.4 to 0.2 hectares*". The EPA queries these totals given Table 4-1 confirms the project will directly impact on 4.2 hectares of Lowland Rainforest and 0.5 hectares of Littoral Rainforest. Please note that the area of impact is expected to increase when the 50m edge affected calculation is further considered. The exact area of impact needs to be confirmed.	
LRTRPMP Sections 5.2 and 5.3.1	The relevant section of the MP states "*Seeds and other propagation material to be collected from threatened rainforest plants prior to clearing works*". Given the purpose of the seed collection is to create Lowland Rainforest EEC the EPA considers this commitment should be extended to ensure the seed collection and propagation program includes, to the greatest extent practicable, all species of flora associated with the subject EECs. The approach is also consistent with the conclusion reached by Andrew Benwell (refer dot point 29).	
LRTRPMP Sections 5.3.1	While EPA supports the following commitment "*To maintain genetic diversity, indirect genetic management would be required in the form of a species genetic study or determining genetic variability through species habitat type and geographic position that can indirectly measure differences between populations*" the EPA suggests that RMS needs to provide further detail on the approaches that will be utilised to achieve this outcome.	
LRTRPMP Sections 5.3.1	The EPA does not support the sowing of rainforest seeds directly into an offset site given this application is likely to be unsuccessful and given it is inconsistent with current rainforest regeneration practices. All collected rainforest seed should be propagated at "*qualified rainforest nurseries or plant propagators, under appropriate quarantine conditions.*., For further information please refer to Andrew	

	Benwell's review.	
LRTRPMP Sections 5.3.1	The recommended planting seasons appear to be incorrect. Planting on the north coast is usually conducted late summer/ early autumn to obtain maximum propagation success. This coincides with seasonal rainfall and reduced temperatures. The plant propagation timing issue should be addressed by RMS.	
LRTRPMP Table 6-1	The EPA notes the following statement "*The landscaping design includes details on revegetation requirements for areas adjacent to threatened plants and translocation/offset areas*" This approach is inconsistent with Andrew Benwell's recommendation RCMP. The EPA's preference in this instance is to support the recommendation of Andrew Benwell,, and ensure that it is reflected in the LRTRPMP.	
LRTRPMP Table 7-7	Only specifies maintenance requirements for the first year after construction. Maintenance requirements should extend into the operational phase until it is demonstrated that a sustainable outcome has been achieved.	
LRTRPMP Section 8.6	The EPA agrees with the subject performance measures, however, it is suggested that the Strategy needs to consider that if the performance measures are not achieved within the five year timeframe the program whether any further ongoing action is required to achieve the performance measures.	
Appendix K Threatened Flora Management Plan (TFMP)	The EPA considers that the current version of the TFMP provides a rigorous approach to the management of the subject vegetation communities. However, it is considered the subject MP needs further refinements based on the expert review recommendations. Some of these issues are discussed in the following text.	
TFMP Section 4.3.1	The EPA supports Andrew Benwell's conclusion that all threatened flora surveys should be done by a botanist with expertise in this field rather than an ecologist with a broader skill set.	
TFMP Section 4.3.3	The relevant section of the plan states "*Seed collection and propagation of threatened plant species would be applied to replace those populations directly lost as a result of construction*". Given the propagated seed is to be used at "*translocated sites and for compensatory planting in offset areas*" the EPA considers this commitment should be extended to ensure that the seed collection and propagation program is extended to include all species of flora associated with the subject vegetation communities.	
TFMP Section 5.3.6	The EPA does not support restricting the maintenance schedule for three years. The EPA considers ongoing maintenance should be performed for the life of the each revegetation program. The EPA also notes Table 8.1 confirms maintenance activities will occur over a six year period.	
TFMP Section 6.2 Tables 6-2 and 7-1	The EPA notes performance targets/ management goals are inconsistent throughout this section of the MP. The EPA does not support the project achieving "*An increase in weed coverage by 10% or weed coverage more than 30% in revegetation areas.*" This outcome is inconsistent with TFIMP35 of Andrew Benwell's critical review which recommended	

	weed density of "less than 5%". The weed density account should also be applicable for both in situ plants and all revegetation areas.	
Appendix K Threatened Invertebrate Management Plan (TIMP)	The EPA considers that the current version of the TFMP provides a rigorous approach to the management of the subject threatened species of invertebrates. However, it is considered the subject MP needs further refinements based on the expert review recommendations. Some of these issues are discussed in the following text.	
TIMP Section 3.2	While the EPA supports an introduction of a " *A monitoring program for rehabilitation areas and retained habitat in the vicinity of the project.*" it is noted that RMS will need to ensure unrestricted access to the subject land parcels.	
TIMP Sections 4.3.2 7.2.1	Given that RMS's invertebrate expert Don Sands concludes habitat disturbance should not occur within 100m (refer TIMP18) of breeding sites the EPA suggests that the proposed baseline assessments and the following monitoring program should be based on this criterion. The EPA notes that inconsistencies occur in relation to the geographic extent of the proposed monitoring program. For instance, Section 4.3.1 refers undertaking surveys up to 100m from the road reserve. Section 4.3.2 refers to recording and marking species that occur within 20m of the project. In comparison, Section 7.2.1 surveys will extend out to a distance of 500m. Revision of these aspects of monitoring program is suggested to ensure consistency.	
TIMP Section 4.3.4.1	Confirms that the collection of plant propagation material will be undertaken " *by an experienced ecologist/ horticulturalist*" For consistency the EPA recommends the plant collection measures contained within Section 4.3.3 of the LRTRPMP should apply.	
TIMP Section 5.3.5 and Table	**Key Issue** In relation to the disturbance of Pink Underwing Moth from street lights the MP confirms that street lighting installed at a distance greater that 500m has no impact on Pink Underwing Moth behaviour (flight, feeding, avoidance). The EPA notes that Table 5-1 confirms that street lighting will be installed within 100m of the species' habitat. The EPA is concerned that this reduced separation distance will likely have an adverse impact on this species and asks that RMS adopts additional mitigation measures to reduce potential impacts?	
TIMP General Comment	**Key Issue** The EPA is of the view the Lowland Rainforest associated with the Southern Pink Underwing Moth (*Phyllodes imperialis southern subspecies*) and Atlas Rainforest Ground-beetle is of conservation significance. The EPA agrees with RMS's invertebrate expert Don Sands (page 53 invertebrate report)	

	that the subject habitats should be protected as a conservation reserve. While the subject land parcels are currently under private ownership it is envisaged RMS will be required to purchase the land parcels to construct the highway. Consequently, upon purchase of the subject land parcels the EPA suggests that some consideration should be given to the rehabilitation and securing of these areas in perpetuity. **Recommended Action** D&PI to request RMS to consider the subject landscapes as part of the overall ecological offsets package that are protected in perpetuity.	
TIMP General Comment	The EPA agrees with RMS invertebrate expert Don Sands that weed management associated with the Southern Pink Underwing Moth (*Phyllodes imperialis southern subspecies*) in lowland rainforest needs to be ongoing. Currently the TIMP limits weed control works to a period of three (3) years post construction.	
TIMP General Comment	It appears that a number of recommendations/observations included within Don Sands critical review remain unaddressed. Further review of this information is warranted.	

Attachment 3: NPWS Park Estate and Biodiversity Related Comments

Contact for comments: Janet Cavanaugh (ph: 02 6641 1551)

The National Parks and Wildlife Service (NPWS – part of the Office of Environment and Heritage) provides the following comments in relation to the project's Preferred Infrastructure Report (PIR).

NPWS suggests the following details require correction

- "the Whiptail Wallaby (Pretty Faced Wallaby) is endangered under the TSC Act See page 2-85 in Chapter 2.
- Coastal emu's are no longer known to occur in the region north of Iluka Road See page 2-91 in Chapter 2. There are recent sightings in the area west of Bundjalung SCA.
- "All biodiversity offsets would be located within the NSW North Coast Bioregion" See page 2-102. The majority of the project sits within the South Eastern Queensland Bioregion and this factor needs to be considered in the biodiversity offset strategy for the project.

- Ban Yabba Nature Reserve (page 3-30) – should be Banyabba Nature Reserve.

The document still indicates that Yaegl Nature Reserve is covered by a SEPP14 wetland dominated by swamp mahogany (see page 4-84 and also p.384 in Appendix J). Statutorily, wetland 220a largely disappeared with the gazettal of the nature reserve although a small part remains on the southern edge of the reserve (SEPP14 does not apply to areas reserved under the NPW Act – (NPWS notes that this detail was acknowledged by RMS in previous submissions). The vegetation in about 95% of the reserve is dominated by *Melaleuca quinquenervia*, and, as such, the vegetation community should be identified as Paperbark Swamp Sclerophyll Forest, not Swamp Oak EEC.

Attachment 4: OEH Aboriginal Cultural Heritage Comments

Environmental Assessment – Upgrading the Pacific Highway– RMS – Woolgoolga to Ballina

Following a review of the '*Upgrading the Pacific Highway- Woolgoolga to Ballina Upgrade- Ancillary facilities and Design Changes – Aboriginal Cultural Heritage Assessment'*, (Sept 2012) and the '*Upgrading the Pacific Highway- Woolgoolga to Ballina Upgrade– Aboriginal Cultural Heritage Assessment* '(Sept 2013) OEH notes the following points for consideration:

- The second last dot point in 1.2. Scope of assessment refers to the assessment undertaken including both the scientific (archaeological) and the social (largely cultural determined by the RAPs). However the following report does not appear to provide a balanced documentation of these duel aspects of the assessment. OEH encourages a partnership approach to the management of Aboriginal cultural heritage

- Effective heritage management requires knowledge of values or cultural significance. An understanding of what makes a place culturally significant and why, enables appropriate decisions to be made about the management of that place. OEH recognises and acknowledges that Aboriginal people are the primary source of information about the significance of their heritage and how this is best protected and conserved and therefore advocate for RAPs having an active role in any Aboriginal cultural heritage planning process.

- OEH encourages the maintenance of continuous consultation processes with the Aboriginal community for the entire project area, particularly in those areas recently identified for impact. OEH considers that for consultation to be effective it needs to be fair, transparent and demonstrate a two way respectful dialogue.

Lang Hill eWMS

The draft Appendix G Lang Hill Environmental Work Method Statement was provided to the Office of Environment and Heritage (OEH) on 27 November 2013 requesting comments on Aboriginal cultural heritage. OEH is providing comments to the Environment Protection Authority for inclusion in a consolidated response to this matter.

OEH has reviewed the documentation provided and considers that Appendix G Lang Hill eWMS contains work methods, processes and activities required to carry out the approved project works that provide adequate contingencies to manage Aboriginal cultural heritage values within the Department of Planning and Infrastructure approval area. However, OEH has identified matters that require further consideration as set out below:

1. The information contained within the Lang Hill eWMS table refers to the clear delineation of '*Aboriginal heritage sites*' to avoid potential damage to heritage items (#3 & #6).OEH recommends careful consideration be given to the choice of material for the fence/barricade between the work area and the known surface expression of the "*Aboriginal heritage sites*' to ensure no impact on any associated sub-surface cultural heritage material.

2. OEH recommends that the pre-construction salvage (#1 in relation to '*areas Aboriginal artefacts are unlawfully disturbed* ') also considers any potential indirect impacts from the approved project activities.

For more information on this matter please contact Ms Rosalie Neve on (02) 6659 8221