

New M5

Environmental Impact Statement

Biodiversity Offset Strategy

Appendix T



November 2015

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Abbreviations

Abbreviation	Description
BAR	Biodiversity Assessment Report
BOS	Biodiversity Offset Strategy
CEEC	Critically Endangered Ecological Community
CMA	Catchment Management Authority
CRCIF	Cooks River / Castlereagh Ironbark Forest
DotE	Commonwealth Department of the Environment
DECCW	NSW Department of Environment, Climate Change and Water (now OEH)
EEC	Endangered Ecological Community
EIS	Environmental Impact Statement
ELA	Eco Logical Australia Pty Ltd
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i> (NSW)
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Commonwealth)
FBA	Framework for Biodiversity Assessment
FM Act	<i>Fisheries Management Act 1994</i> (NSW)
GGBF	Green and Golden Bell Frog
IBRA	Interim Biogeographic Regionalisation for Australia
LGA	Local Government Area
MNES	Matters of National Environmental Significance
NPWS	NSW National Parks and Wildlife Service (part of OEH)
DPE	NSW Department of Planning and Environment, formerly the Department of Planning and Infrastructure
OEH	NSW Office of Environment and Heritage
PCT	Plant Community Type
SEARs	Secretary's Environmental Assessment Requirements
SSD	State Significant Development
SSI	State Significant Infrastructure
TEC	Threatened Ecological Community
TSC Act	<i>Threatened Species Conservation Act 1995</i> (NSW)
VIS	Vegetation Information System

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Executive summary

Roads and Maritime Services (Roads and Maritime), is seeking approval to construct and operate the New M5 (the project); which would comprise a new multi-lane road link comprising connections of new motorway tunnels (around nine kilometres long) between the existing M5 East Motorway east of King Georges Road and St Peters. The project would also include an interchange and connections to the existing road network at St Peters.

Approval is being sought under Part 5.1 of the Environmental Planning and Assessment Act 1979 (EP&A Act). The project is declared to be State significant infrastructure (SSI) under section 115U(2) of the EP&A Act by reason of the operation of clause 14 and Schedule 3 of the *State Environmental Planning Policy (State and Regional Development) 2011*. Accordingly, the project is subject to assessment under Part 5.1 of the EP&A Act and requires the approval of the Minister for Planning. An environmental impact statement (EIS) is therefore also required.

On 11 August 2015, the Commonwealth Minister for the Environment determined that the project has the potential to significantly impact on a matter of national environmental significance and is therefore a 'controlled action'. This means that approval of the project will be required from the Commonwealth Minister for the Environment in addition to environmental and planning approvals required under State legislation.

Under the Bilateral Agreement relating to environmental assessment (February 2015) between the Commonwealth Government and the NSW Government, this EIS has been adopted for the purpose of meeting the assessment requirements of both the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and the NSW EP&A Act.

The New M5 is subject to the requirements of the *NSW Biodiversity Offsets Policy for Major Projects*. Under this policy, development impacts are assessed via the Framework for Biodiversity Assessment (FBA), with the production of a Biodiversity Assessment Report (BAR) and a Biodiversity Offset Strategy (BOS). The BOS outlines the offsets required for unavoidable biodiversity impacts, that is, those residual impacts which remain after impacts have been avoided, minimised and mitigated to the extent that is reasonable and feasible. The aim of this BOS is to demonstrate that appropriate offsets for the residual impacts to biodiversity are available and can be delivered.

There are two Plant Community Types (PCT) and one threatened species requiring offsets. No ecosystem credits are currently available for the PCTs, but there are several interested parties who have expressed an interest in providing the required credits through the establishment of a Biobanking agreement. There are credits available for the species credits species, the Green and Golden Bell Frog (*Litoria aurea*), which would satisfy the majority of the credits required. Negotiations are ongoing with a range of interested parties, and it is likely that the offsets required would be achieved in large part through Biobanking agreements. However it is also possible that the BOS would include, at least in part, supplementary measures where the required credits are unavailable.

However, all efforts are being made to offset all Matters of National Environmental Significance (MNES) on a strict like for like basis and other measures will only be pursued in way that is consistent with Commonwealth Offsetting policy and in consultation with the Commonwealth.

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1 Introduction

This Biodiversity Offset Strategy (BOS) accompanies the Technical Working Paper: Biodiversity Assessment Report (BAR) for the New M5 Environmental Impact Statement (EIS). This BOS (Stage 3) should be read in conjunction with the BAR, which outlines in detail the impacts assessed and the rationale for assessment (Stages 1 and 2).

1.1 Requirements under the Framework for Biodiversity Assessment

The NSW Government has developed a NSW Biodiversity Offsets Policy for Major Projects (OEH 2014a), including State Significant Development (SSD) and State Significant Infrastructure (SSI). As part of an application for a Major Project under the *Environmental Planning & Assessment Act 1979* (EP&A Act), a proponent must prepare an EIS that addresses the Secretary's Environmental Assessment Requirements (SEARs) provided by the NSW Department of Planning and Environment (DP&E).

Under the NSW Biodiversity Offsets Policy for Major Projects, the SEARs require the Framework for Biodiversity Assessment (FBA) to be applied to assess impacts on biodiversity. The FBA (OEH 2014b) outlines the assessment methodology to quantify and describe the biodiversity values on the development site, and the biodiversity offsets required for any unavoidable impacts.

The FBA requires proponents to provide offsets on a like for like basis. This means that the biodiversity present at the development site should be the same type of ecological community (in the case of a Threatened Ecological Community (TEC)) or have the same habitat values (in the case of a threatened species) as the biodiversity present at the offset site.

Some flexibility to the "like for like" rules is available for species and communities which are not listed on the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) as a nationally threatened species or ecological community, provided they are not listed as a Critically Endangered Ecological Community (CEEC) or Critically Endangered threatened species under the *Threatened Species Conservation Act 1995* (TSC Act). This flexibility allows for a wider range of offsets to be provided.

In addition, both NSW and Commonwealth offset policies (DSWEPaC 2012) allow other conservation measures to be used in lieu of offsets in some instances.

Under NSW policy, these are known as supplementary measures and are defined as: *another measure undertaken as part of the BOS that is likely to lead to improvements in biodiversity or other environmental values that are not on an offset site*. NSW policy requires that supplementary measures be of an equivalent cost to the provision of offsets.

Under Commonwealth policy, these are known as other compensatory measures and there is a limit on how much offsetting can be provided using these measures.

However, all efforts are being made to offset all Matters of National Environmental Significance (MNES) on a strict like for like basis and other measures will only be pursued in way that is consistent with Commonwealth Offsetting policy and in consultation with the Commonwealth.

1.1.1 Impacts to be offset

The BAR outlined that the following impacts requiring an offset to be determined.

Table 1: Plant community types requiring offsets

PCT	Area impacted (hectares)	Credits required
Broad-leaved Ironbark – <i>Melaleuca decora</i> shrubby open forest on clay soils of the Cumberland Plain, Sydney Basin Bioregion (PCT 725)	1.40	31
Paperbark swamp forest of the coastal lowlands of the NSW North Coast Bioregion and Sydney Basin Bioregion (PCT 1064)	1.82	27

Table 2: Species credit species requiring offsets

Species	Area impacted (hectares)	Credits required
<i>Litoria aurea</i> (Green and Golden Bell Frog)	7.82	203

2 Offset investigations

There are two options, or a combination of the two, available under the FBA to fulfil offset requirements that are relevant to this project:

- Retiring biodiversity credits – like for like offsets are secured and credits retired
- Contributing to supplementary measures.

Biodiversity credits are generated when a landholder agrees to enter a Biobanking agreement. A Biobanking agreement:

- Provides annual in perpetuity payments to landholders to actively manage their land for its habitat values in accordance with a management plan
- Is supported by a robust monitoring and compliance framework administered by the NSW Office of Environment and Heritage
- Is attached to property title and obligations to manage the land (and receive annual payments) transfers to new owners if the property is sold.

A process to determine if any credits were available for all the required offsets was followed. This process is outlined in **Table 3**.

Table 3: Process to identify biodiversity credits for the New M5

Step	Activity
Check credits available	For the relevant item, check the OEH biodiversity credits register to determine if matching credits have been issued and are available
Check expression of interest	Check the OEH Biobank site expression of interest (EOI) register to determine if a landholder may have matching credits that are not yet issued
Put a request on the credits wanted register	Place a 'credits wanted' request on the OEH credits wanted register for the approximate number and type of credits
Seek candidate sites	Undertake a desktop assessment of vegetation types, tenure and patch size to shortlist potential sites and landholders.
Test landholder interest	Use the shortlist to contact landholders to determine interest in entering into a Biobanking agreement and selling credits to Roads and Maritime
Investigate options for supplementary measures and estimate costs	The indicative cost of supplementary measures is estimated using similar credits already sold as part of the Biobanking scheme as a surrogate

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3 Efforts to secure credits

3.1 Cooks River / Castlereagh Ironbark Forest CEEC

The Cooks River / Castlereagh Ironbark Forest is listed under the TSC Act as an Endangered Ecological Community (EEC) and the EPBC Act as a CEEC. Cooks River / Castlereagh Ironbark Forest is synonymous with the PCT *Broad-leaved Ironbark Melaleuca decora shrubby open forest on the clay soils of the Cumberland Plain, Sydney Basin Bioregion (PCT 725 or ME002)* hereafter referred to as Broad-leaved Ironbark Melaleuca decora shrubby open forest. The offset requirements for Broad-leaved Ironbark Melaleuca decora shrubby open forest as determined by the application of the FBA calculator (ELA 2015) were 31 ecosystem credits.

3.1.1 Reasonable steps to secure like for like credits

Examination of credits available

In December 2014, the OEH biodiversity credits register was searched to determine if credits were available for purchase for the Broad-leaved Ironbark Melaleuca decora shrubby open forest PCT. No credits were available for purchase.

Examination of biobank site EOI register

The OEH Biobank site EOI register has been checked on a regular basis to determine if any landholders were seeking to enter into a Biobanking agreement that included the Broad-leaved Ironbark Melaleuca decora shrubby open forest PCT (PCT 725 or ME002).

Credits wanted register

On 16 December 2014, a request for credits for *Broad-leaved Ironbark Melaleuca decora shrubby open forest* (PCT 725 or ME002) was registered on the OEH BioBanking public registers web page. The major project policy states that 'reasonable steps' includes advertising on the credits wanted register for at least six months.

During the six month period, there was one approach by a landholder's representative with *Broad-leaved Ironbark Melaleuca decora shrubby open forest* ecosystem credits available. The landholder (Landholder A) was willing to consider a Biobanking agreement on land containing *Broad-leaved Ironbark Melaleuca decora shrubby open forest*. It is understood that Landholder A is familiar with the Biobanking scheme, having entered into an agreement in the Warringah LGA. Discussions with this Landholder A are ongoing.

Identifying candidate sites

A spatial analysis of the Sydney Metropolitan Catchment Management Authority (OEH 2013) vegetation mapping was conducted. This assessment searched for areas with the following characteristics:

- Contained mapped Broad-leaved Ironbark Melaleuca decora shrubby open forest on the clay soils of the Cumberland Plain, Sydney Basin Bioregion (PCT 725 or ME002)
- Were larger than 10 hectares
- Were in the same IBRA subregion as the development site or in adjoining IBRA subregions.

This exercise identified a number of candidate sites which were then shortlisted for further exploration with the landowners to determine their interest in registering Biobanking agreements over their land.

In addition to this desktop exercise, three local councils were contacted to determine if there were areas of *Broad-leaved Ironbark Melaleuca decora shrubby open forest* that could be established as Biobanking sites. Councils contacted were Liverpool City, Penrith City and Hawkesbury City Councils.

Penrith Council did not have any public lands that had *Broad-leaved Ironbark Melaleuca decora shrubby open forest* available for a Biobanking agreement. Liverpool Council are currently considering whether they are able to take up a Biobanking agreement on council managed land that supports the PCT according to OEH (2013). Hawkesbury City Council did not reply.

Approaches were made to one private landholder (Landholder B). Landholder B was interested in having an initial discussion. Discussions with this landholder will continue.

A summary of the reasonable steps taken to identify and secure the ecosystem credits required for *Broad-leaved Ironbark Melaleuca decora shrubby open forest* are outlined in **Table 4**.

Table 4: Summary of reasonable steps to identify and secure Broad-leaved Ironbark Melaleuca decora shrubby open forest ecosystem credits

Step	Activity	Outcome
Are credits available?	Checked public register in December 2014 and regularly since	No credits available
Is there an EOI of relevant credits?	Checked public register in December 2014 and regularly since	No EOI for these credits
Credits wanted register	Put a request for credits on register on 16 December 2014	Approach by representative of one landholder (Landholder A) – likely to fulfil entire credit requirement if Biobanking agreement registered
Identify candidate sites	Conduct desktop assessment	A number of sites with mapped remnant PCT were identified. Ten sites of the PCT covering approximately 250 hectares of land were shortlisted. Aerial imagery was inspected to determine how much of the parcels were vegetated. Of these, a list of potential sites was constructed for further exploration.

Step	Activity	Outcome
Landholder attitude	Contact local Councils Liaise with landholders	Penrith Council does not have any Broad-leaved Ironbark Melaleuca decora shrubby open forest on public lands Liverpool Council is considering their position. If a Bioanking site was registered, it would likely fulfil all of the credit requirements for this ecosystem. An approach to a private landholder (Landholder B) was made. This landholder was interested in hearing about the scheme. Discussions will continue as they have indicated a desire to develop discussions further.

3.1.2 Supplementary measures

The currently estimated cost of providing offsets for the residual unavoidable impacts for this PCT would be approximately \$465,000 for 31 credits at \$15,000 per credit (based on the current market). While no trades of this PCT have been made, the cost of similar PCTs found on the Cumberland Plain suggest that this predicted credit price is reasonable. While all efforts would be made to seek 100 per cent of offsets via purchase and retirement of biodiversity credits, if there is a shortfall, ten per cent of the offset obligation amounting to an estimated \$46,500 would be invested in the conservation measures listed below, in consultation with the Commonwealth and the State.

Measures relevant to CRCIF (Broad-leaved Ironbark Melaleuca decora shrubby open forest) and which meet the Tier One supplementary measures include actions that are outlined in the Cumberland Plain Recovery Plan (DECCW 2010) or the priority action statements outlined on the OEH website for CRCIF. Priority actions included the following:

Update mapping

One of the key actions to protect and recover the CRCIF is to identify its current extent and condition. The Cumberland Plain Recovery Plan identified 708 hectares of CRCIF in priority conservation lands. This action could be funded to provide up to date and spatially explicit mapping that has been ground-truthed.

Target weeds on public land

A proposed measure could be to develop and promote a landscape-scale response to African Olive invasion on public and private lands within the Cumberland Plain. If this action was pursued, it should be undertaken in consultation with OEH and local councils.

Undertake research

There is a provision in the major projects offset policy to provide funds for research. However the research component is capped at 10 per cent of the total offset. This is consistent with the Commonwealth Government's policy.

The Cumberland Plain Recovery Plan outlines key areas for research to assist recovery of ecological communities on the Cumberland Plain. The key themes are:

- Investigating ecological restoration
- Increasing our understanding of threatened species, populations and communities
- Improving management practices and responses.

Suggested research topics relevant to CRCIF could include the following:

- developing and refining revegetation techniques appropriate to Cumberland Plain threatened ecological communities that re-establish understorey diversity and structure
- determining the role of pollination vectors in habitat restoration
- undertaking trials to establish the propagation requirements for key Cumberland Plain species (including threatened species, populations and communities) to assist with restoration
- researching ecosystem dynamics, particularly response to disturbance and the role of soil seed banks
- identifying key species with tolerance to salinity for revegetation in riparian areas and areas affected by salinity
- establishing the relationship between remnant size and ecological value
- understanding habitat requirements for sustainable fauna populations, including the bushland corridor requirements necessary to facilitate movement of fauna
- developing a system of target species/bio-indicators to assess vegetation condition and ecological resilience of Cumberland Plain threatened ecological communities and remnants
- investigating the impact of fire on fauna.

Outcomes

At this stage, supplementary measures are unlikely to be required. If retirement of credits is not achieved, some of these measures should be explored in consultation with OEH, local councils and the approvals authorities.

3.2 Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner Bioregions EEC

Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner Bioregions is listed as an EEC under the TSC Act. The *Paperbark swamp forest of the coastal lowlands of the NSW North Coast Bioregion and Sydney Basin Bioregion (PCT 1064 or ME050)*, hereafter referred to as the Paperbark swamp forest, is a component of the Swamp Sclerophyll Forest EEC. The offset requirements for Paperbark swamp forest as determined by the application of the FBA calculator (ELA 2015) were 27 ecosystem credits.

3.2.1 Reasonable steps to secure like for like credits

Examination of credits available

No credits were available for this PCT. No credits for this PCT have been issued or retired according to the OEH biodiversity credits search page.

Examination of EOI page

No expressions of interest to enter into a BioBanking agreement for this PCT have been registered on the OEH EOI page.

Credits wanted register

Searches of the expressions of interest page have revealed there were no expressions of interest to establish a biobanking agreement that involved this PCT. There have been no credits for the *Paperbark swamp forest* PCT issued or transactions since the inception of the scheme.

A credits wanted request was placed on 11 August 2015.

Searches for potentially interested landholders are continuing.

Identifying candidate sites

When a proponent is unable to locate a 'like for like' offset after taking reasonable steps, there is an option to apply the variation rules. This option is available for the Paperbark swamp forest PCT as it is not listed under the EPBC Act. The Major Project Offsets Policy variation rules allow for impacts on ecosystem species to be offset with PCTs of the same vegetation formation that has undergone equal or greater levels of clearing, as the PCT requiring offsets.

Paperbark swamp forest is in the 'forested wetlands' vegetation formation. According to the Vegetation Information System (VIS), which lists all plant community types in NSW, the Paperbark swamp forest PCT is 50 per cent cleared. A review of PCTs in the forested wetland vegetation formation produced a list of candidate PCTs which have undergone equal or greater levels of clearing than the *Paperbark swamp forest*. These PCTs are shown in **Table 5**.

Table 5: PCTs in the Forested Wetland vegetation formation with more than 50 per cent clearance

BVT / PCT number	PCT name	CMA
HN594/ME026/ SR649/ 1232	Swamp Oak floodplain swamp forest, Sydney Basin Bioregion and South East Corner Bioregion	HN, SR ME
HN595/ME023/ SR650/HU635 1234	Swamp Oak swamp forest fringing estuaries, Sydney Basin Bioregion and South East Corner Bioregion	HN, HCR, SR, ME
HN578/1386	Rough-barked Apple - red gum grassy woodland of the MacDonald River Valley on the Central Coast, Sydney Basin Bioregion	HN
SR542/828	Floodplain wetlands of the coastal lowlands, southern South East Corner Bioregion	SR
SR546/839	Forest Red Gum - Woollybutt - Pithy Sword-sedge swamp woodland in dune swales near Pambula, southern South East Corner Bioregion	SR
SR665/1318	White Sally Wattle - <i>Leptospermum emarginatum</i> riparian scrub of the Bega and Towamba valleys, southern South East Corner Bioregion	SR
HU532/780	Coastal floodplain sedgelands, rushlands, and forblands of the North Coast	HCR

CMA names are as follows HN = Hawkesbury Nepean, HCR = Hunter Central Rivers, SR = Southern Rivers, ME = Sydney Metropolitan

A search of the credits issued register was performed to determine if any credits of the alternate PCTs were readily available (**Table 6**). While some credits have been issued for two of these PCTs, none were available for purchase and retirement.

Table 6: Availability of credits of alternate PCT

BVT / PCT number	PCT name	Credits available
HN594/ME026/ SR649/ 1232	Swamp Oak floodplain swamp forest, Sydney Basin Bioregion and South East Corner Bioregion	Credits issued in SR but none available
HN595/ME023/ SR650/HU635 1234	Swamp Oak swamp forest fringing estuaries, Sydney Basin Bioregion and South East Corner Bioregion	Credits issued in SR and HCR but none available
HN578/1386	Rough-barked Apple - red gum grassy woodland of the MacDonald River Valley on the Central Coast, Sydney Basin Bioregion	None issued, none available
SR542/828	Floodplain wetlands of the coastal lowlands, southern South East Corner Bioregion	None issued, none available
SR546/839	Forest Red Gum - Woollybutt - Pithy Sword-sedge swamp woodland in dune swales near Pambula, southern South East Corner Bioregion	None issued, none available
SR665/1318	White Sally Wattle - <i>Leptospermum emarginatum</i> riparian scrub of the Bega and Towamba valleys, southern South East Corner Bioregion	None issued, none available
HU532/780	Coastal floodplain sedgelands, rushlands, and forblands of the North Coast	None issued, none available

CMA names are as follows: HCR = Hunter Central Rivers, SR = Southern Rivers

3.2.2 Supplementary measures

The currently estimated cost of providing offsets for the residual unavoidable impacts for this PCT would be approximately \$405,000 for 27 credits at \$15,000 per credit (based on the current market). While no trades of this PCT have been made, the cost of similar PCTs suggest that this predicted credit price is reasonable. While all efforts would be made to seek 100 per cent of offsets via purchase and retirement of biodiversity credits, if there is a shortfall, ten per cent of the offset obligation amounting to \$40,500 would be invested in the conservation measures listed below, in consultation with the NSW authorities.

OEH has identified the following management actions as being relevant to this community:

- Undertake weed control for Bitou Bush and Boneseed at priority sites in accordance with the approved Threat Abatement Plan and associated PAS actions.
- Determine location, species composition and threats to remaining remnants to assist with prioritising restoration works.
- Collect seed for NSW Seedbank. Develop collection program in collaboration with Botanic Gardens Trust - all known provenances (conservation collection).

As before, any supplementary measure should be determined in consultation with the consent authority and with advice from OEH.

3.3 Green and Golden Bell Frog

The Green and Gold Bell Frog is listed as 'Endangered' under the NSW TSC Act and as 'Vulnerable' under the EPBC Act. It is a species credit species, meaning that the credits for this species may be sought wherever they are available and are not restricted to any particular IBRA region or sub-region. Because the Green and Gold Bell Frog is listed under both the State and Federal legislation, an application to vary the offset rules is not applicable.

The offset requirements for the Green and Golden Bell Frog as determined by the application of the FBA calculator (ELA 2015) were 203 species credits.

Consistent with the Guidelines for preparing Assessment Documentation relevant to the EPBC Act: WestConnex New M5 Project (EPBC 2015/7520), consideration has also been given to whether there is any significant residual impacts not addressed by the FBA (ie not related to vegetation clearance) that need to be offset.

Given the extensive mitigation and management strategy set out in the Biodiversity Assessment Report which is designed to manage impacts on the RTA ponds and enhance adjacent habitat, it is considered that there will be no significant residual impacts arising from impacts to the RTA frog ponds or adjacent habitat that requires offsetting.

3.3.1 Reasonable steps

Examination of EOI page

A search of the EOI register for establishing biobank agreements revealed that there were two interested parties (EOI 12 and EOI 154) seeking to establish a Biobanking agreement with Green and Golden Bell Frog credits.

Of the two EOI parties, one has not registered a Biobanking agreement and has not confirmed that there are Green and Golden Bell Frogs present on that site (EOI 12). The owner of that EOI is located in the Macleay-Hastings IBRA subregion. The other party (EOI 154) has credits available (credit owner 204) (see below).

Credits wanted request

On 16 December 2014, a request for credits for the Green and Golden Bell Frog was registered on the OEH Biobanking public registers web page. During the six month period, two approaches were made by interested parties.

One of the two interested parties has 175 credits available for sale (credit owner ID 204). These credits have been issued in the Macleay-Hastings IBRA sub-region. These credits would satisfy most of the credits required, which is 203 credits.

The second party has not registered a Biobanking agreement, but may be willing to do so. If an agreement was pursued, the credits would be available in the Sydney Basin Bioregion in the Cumberland IBRA subregion.

In October 2015, the original credits wanted request was updated. A third party with potential Green and Golden Bell Frog credits responded to this renewed credits wanted request. This party is in the process of submitting an application for a Biobank agreement at a site in the Macleay-Hastings IBRA sub-region.

Roads and Maritime are in discussions with all interested parties.

3.3.2 Other measures

Roads and Maritime own land at Marsh Street directly adjacent to the existing M5 East Motorway and in proximity to the existing RTA ponds. The creation of new Green and Golden Bell Frog habitat at this location is being pursued as part of the management plan for this species at this location as part of the overall management of the Arncliffe Green and Golden Bell Frog population. If needed, this action will be used as a supplementary measure for this species.

In addition, a Biobanking agreement (supported by the annual payments from the BioBanking Trust Fund) could provide the basis for the secure long term funding for the management of any recreated habitat. Active management is essential to the ongoing persistence of this species at Arncliffe due to the ongoing threats of plague minnow (*Gambusia holbrooki*), weed infestation and disease.

4 Conclusion

Roads and Maritime is committed to providing a BOS that offsets the impacts of the proposed development consistent with the requirements of the FBA and Major Projects Offsets Policy. The BAR has identified the number and type of credits that are required to be offset as a result of the proposed development. Roads and maritime has been actively pursuing these credits. To date, Roads and Maritime have been unable to secure and retire the required credits, but there is potential to do this.

The development of the BOS is ongoing, however works undertaken to date, suggest that BOS is may include both the retirement of relevant ecosystem and species credits through Biobanking agreements, and where credits cannot be obtained for the full offset amount, the provision of supplementary measures. .

However, all efforts are being made to offset all Matters of National Environmental Significance (MNES) on a strict like for like basis and other measures will only be pursued in way that is consistent with Commonwealth Offsetting policy and in consultation with the Commonwealth.

The following biodiversity credits are being sought for the residual unavoidable impacts resulting from the project:

- 31 credits for Broad-leaved Ironbark - *Melaleuca decora* shrubby open forest on clay soils of the Cumberland Plain, Sydney Basin Bioregion (PCT 725)
- 27 credits for Paperbark swamp forest of the coastal lowlands of the NSW North Coast Bioregion and Sydney Basin Bioregion (PCT 1064)
- 203 credits for Green and Golden Bell Frog.

Contact with landholders has been made and these landholders have expressed an interest in pursuing establishment of biodiversity credits for Cooks River /Castlereagh Ironbark Forest and Green and Golden Bell Frog on their land. At this stage, expressions of interest are being sought for Swamp Sclerophyll Forest. These discussions and expressions of interest continue and it is expected that within three years of approval, all offsets would be secured.

While indicative, the anticipated costs to secure biodiversity credits are likely to be \$885,000 for the ecosystem credits and \$1,230,000 for the species credits. .

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