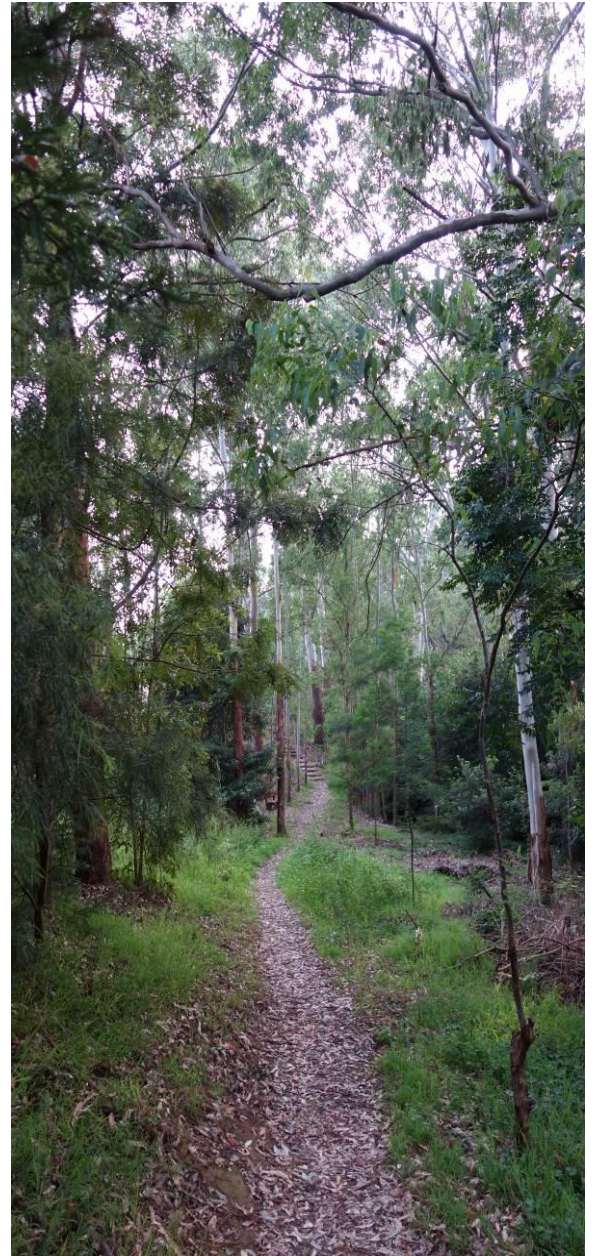




North West Rail Link

Biodiversity Offset Package (revised July 2018)

Prepared for
Transport for NSW
25 July 2018



DOCUMENT TRACKING

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Abbreviations

ABBREVIATION	DESCRIPTION
BBAM	Biobanking Assessment Methodology
BGHF	Blue Gum High Forest
BOS	Biodiversity Offset Strategy
BOP	Biodiversity Offset Package
CMA	Catchment Management Authority
CPW	Cumberland Plain Woodland
CSSTF	Coastal Shale Sandstone Transition Forest
DECCW	former NSW Department of Environment, Climate Change and Water (now OEH)
DGRs	Director-General's Requirements
DSEWPaC	Former Commonwealth Department of Sustainability, Environment, Water, Populations and Communities (now DoE)
DoE	Commonwealth Department of the Environment
DP&I	Former NSW Department of Planning and Infrastructure (now 'Planning and Infrastructure')
EA Report	Ecological Assessment Report
EIS	Environmental Impact Statement
ELA	Eco Logical Australia Pty Ltd
ENV	Existing Native Vegetation (as relevant to the Growth Centres Biodiversity Certification Order)
EP&A Act	NSW <i>Environmental Planning and Assessment Act 1979</i>
EPBC Act	Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i>
IoM	Improve or Maintain
LGA	Local Government Area
MNES	Matters of National Environmental Significance (EPBC Act)
NWRL	North West Rail Link
NPW Act	NSW <i>National Parks and Wildlife Act 1975</i>
OEH	NSW Office of Environment and Heritage
RFEF	River Flat Eucalypt Forest
SSI	State Significant Infrastructure
SSTF	Shale Sandstone Transition Forest
TIF	Turpentine Ironbark Forest
TSC Act	NSW <i>Threatened Species Conservation Act 1995</i>

Executive Summary

Eco Logical Australia Pty Ltd was commissioned by Transport for NSW to develop a Biodiversity Offset Package consistent with the Statement of Commitments in the Ecological Assessment Report for the North West Rail Link and the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) State Significant Infrastructure (SSI) 5100 Condition of Approval C5.

The EA Report (ELA 2012) identified 30.87 ha of direct impacts to six native vegetation communities, five of which are listed as either endangered or critically endangered ecological communities.

A total of 11.51 ha of this impact is to 'certified' vegetation within the Sydney Growth Centres, and these impacts have already been offset via the Growth Centres Certification Order, and thus the North West Rail Link does not need to provide an offset for these impacts. However, there will be a total of 0.65 ha of impact to 'non-certified' existing native vegetation (ENV) within the Growth Centres, which will be offset in accordance with the Growth Centres Certification Order.

The remaining direct impact on 18.71 ha is required to be offset, consistent with the Principles for Offsets in NSW.

The Ecological Assessment Report included a Biodiversity Offset Strategy which proposed offset ratios ranging from 3:1 to 5:1 depending on the condition of the vegetation being impacted, resulting in an offset target area of 67.95 ha, which is an overall offset ratio of 3.63:1 for the 18.71 ha of impact that requires offsets as well as the offsets required for impacts to non-certified Existing Native Vegetation in the Growth Centres.

The options to secure these offsets were identified and investigated. The purchase of biodiversity credits from registered Biobank site was determined to be the most cost effective way of meeting the offset requirements for the project whilst meeting the Principles for Offset in NSW (i.e. they are permanently protected on title, are fully funded (providing management funds in perpetuity) and have built in annual monitoring and compliance provisions).

The offset commitments in the Ecological Assessment Report were converted to an equivalent number of Biodiversity Credits by using the average number of credits generated at registered Biobank sites for each vegetation type impacted. This conversion has resulted in a requirement to purchase 694 biodiversity credits in proportions matching each of the vegetation types impacted as outlined in this Biodiversity Offset Package.

This Biodiversity Offset Package has been developed in consultation with the Office of Environment and Heritage and Planning and Infrastructure.

Transport for NSW has now purchased and retired all of the required 694 credits.

Cheltenham Update

In July 2018 this document was updated to address ecological offset requirements resulting from the Cheltenham Oval Community Facility. The contents of the Biodiversity Offset Package was updated to identify the status of the credits for the project using Biobanking credits. For the Cheltenham Oval Community Facility, the Biodiversity Assessment Method was used to determine the credits required, as per the material supplied in **Appendix 6**. Consultation has occurred with both the Office of Environment and Heritage and the Biodiversity Conservation Trust on this approach. Once approved, Transport for

NSW will make payment to the Biodiversity Conservation Trust to satisfy the credit requirement for the Cheltenham Oval Community Facility works.

1 Introduction

1.1 PROJECT BACKGROUND

Eco Logical Australia Pty Ltd (ELA) was commissioned by Transport for NSW to develop a Biodiversity Offset Package (BOP) consistent with the Statement of Commitments in the Ecological Assessment Report (EA Report) for the North West Rail Link (NWRL) and the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) State Significant Infrastructure (SSI) 5100 Condition of Approval C5.

The EA Report (ELA 2012) identified 30.87 ha of direct impacts to native vegetation comprised of:

- Blue Gum High Forest (1.01 ha) – a critically endangered ecological community
- Coastal Shale/Sandstone Forest (1.33ha)
- Cumberland Plain Woodland (25.10 ha), - an endangered ecological community, comprised of:
 - 13.88 ha outside of the North West Growth Centres; and
 - 11.22 ha (within the North West Growth Centre, of which 0.08 ha is non-certified)
- River Flat Eucalypt Forest (2.33 ha), - an endangered ecological community, comprised of:
 - 1.39 ha outside of the North West Growth Centres; and
 - 0.94 ha (within the North West Growth Centre, of which 0.57 ha is non-certified)
- Shale Sandstone Transition Forest (0.78 ha) - an endangered ecological community; and
- Sydney Turpentine Ironbark Forest (0.32 ha), - a critically endangered ecological community.

As identified above, a total of 11.51 ha of this impact is to ‘certified’ vegetation within the Sydney Growth Centres, and these impacts have already been offset via the Growth Centres Certification Order, and thus the North West Rail Link does not need to provide an offset for these impacts. However, there will be a total of 0.65 ha of impact to ‘non-certified’ existing native vegetation (ENV) within the Growth Centres, which will be offset in accordance with the Growth Centres Certification Order.

The remaining direct impact on 18.71 ha is required to be offset, consistent with the Principles for Offsets in NSW.

Since the Ecological Assessment (EA) report there have been refinements to the project design which have further avoided and/or minimised ecological impacts. The final impacts will therefore be lower than stated in the EA report. However, this BOP has been prepared based on the impacts outlined in the EA report. In accordance with CoA C1, an ecological monitoring and reporting program has been established to assess and report on the projects final impacts.

The EA report included a Biodiversity Offset Strategy (Section 5.4 and Appendix N) which proposed offset ratios ranging from 3:1 to 5:1 depending on the condition of the vegetation being impacted, resulting in an offset target area of 67.95 ha, which is an overall offset ratio of 3.63:1 for the 18.71 ha of impact that requires offsets (**Table 1** and **Appendix 1**, ELA 2012) as well as the offsets required for impacts to non-

certified Existing Native Vegetation (ENV) in the Growth Centres. The offset strategy also included a number of performance measures to ensure that the offsets were consistent with the 'Principles for Offsets in NSW' including that they be secured on land with ecologically functioning native vegetation, were "like for like" in terms of the vegetation being impacted, were managed and funded in perpetuity in accordance with a management plan and were provided within the Sydney Metropolitan and Hawkesbury-Nepean Catchment Management Areas (CMAs).

The Biodiversity Offset Strategy in the EA stated that "*No offsets are proposed for indirect impacts as with the mitigation measures proposed there is unlikely to be significant impacts outside of the construction footprint*". The mitigation measures to minimise ecological impacts included (1) in the Environmental Management Framework: site-specific environmental induction; identification of clearing limits and protective fencing; vegetation clearance procedure; reuse of top soil and habitat elements; erosion and sediment control; weed management, and monitoring, (2) Vegetation Management Plans for reaches of riparian zones which intersect with the construction footprint and for native vegetation for up to 50m adjacent to the construction footprint for construction sites at: Epping, Cheltenham and, Cherrybrook, and (3) Other specific measures to minimise and mitigate the ongoing indirect impacts of the project upon native vegetation and fauna including: erosion and sediment control devices which incorporate monitoring and maintenance, seeking to minimise disturbance to fauna. This has now been approved, and therefore this BOP identifies offsets for direct impacts.

This report outlines the consultation that has occurred with the Office of Environment and Heritage (OEH) and Department of Planning and Infrastructure (DP&I) now Planning and Infrastructure (P&I) during the development of the package (**Section 1.3**), how each of these requirements has been addressed and the offset options investigated (**Section 2**), and the final suite of offset measures selected and secured in accordance with the BOS (**Section 3**) or Commitments made to secure remaining requirements (**Section 4**).

Offsets for impacts to Matters of National Environmental Significance (MNES) are not dealt with in this report as they have already been secured and agreed to with the then Commonwealth Department of Sustainability, Environment, Water, Populations and Communities (EPBC Act 2012/6360), now Department of Environment.

Table 1: Summary of offset commitments as per Table 27 of the Ecological Assessment Report (ELA 2012)

Vegetation Type Impacted	Impacts as outlined in EA Report (ha)	Total Offset Proposed in EA Report (ha)
Cumberland Plain Woodland	13.88	51.22
River Flat Eucalypt Forest	1.39	4.63
Shale Sandstone Transition Forest	0.78	2.34
Coastal Shale Sandstone Transition Forest	1.33	5.75
Turpentine Ironbark Forest	0.32	0.98
Blue Gum High Forest	1.01	3.03
Non certified ENV in Growth Centres	0.65	0.65/1.95
	18.71	68.6/69.9

In accordance with biodiversity measure 8 and 11 of the Growth Centres Biodiversity Certification Order, impacts to non-certified ENV can be offset by the protection of an equal or greater area of ENV elsewhere in the Growth Centres or the revegetation of land within the Growth Centres at a ratio of at least 3:1.

1.2 CONDITIONS OF APPROVAL

EP&A Act Condition of Approval (CoA) SSI-5501 C5 requires that the Biodiversity Offset package is to be:

Developed and submitted to the Director General within 12 months of the commencement of construction, or otherwise as agreed to by the Director General.

The package shall detail how the ecological values lost as a result of the SSI will be offset.

The package shall be developed in consultation with OEH and the Department (Strategies and Land Release) and shall, unless otherwise agreed by the Director General, include, but not necessarily be limited to:

a) the identification of the extent, types and condition of habitat that shall be lost or degraded as a result of the SSI, including the consideration of indirect impacts on adjacent retained vegetation and impacts caused through weed incursion and other potential edge effects;

b) the objectives and outcomes necessary to address impacts on all native flora and fauna species and vegetation communities located in the North West Growth Centre, but not certified under the Biodiversity Certification Order, or located on land outside of the North West Growth Centre;

c) the final suite of the biodiversity offset measures selected and secured in accordance with the Biodiversity Offset Strategy;

d) the management and monitoring requirements for compensatory habitat works and other biodiversity offset measures proposed to ensure the outcomes of the package are achieved, including:

i) the monitoring of the condition of species and ecological communities at offset locations;

ii) the methodology for the monitoring program(s), including the number and location of offset monitoring sites, and the sampling frequency at these sites;

iii) provisions for the annual reporting of the monitoring results for a set period of time as determined in consultation with the OEH; and

e) timing and responsibilities for the implementation of the provisions of the Package

Further, Land offsets shall be consistent with the Principles for the use of Biodiversity Offsets in NSW. Notwithstanding, in relation to areas of non-certified ENV within the North West Growth Centre, offset requirements must be consistent with the Growth Centres Biodiversity Certification Order (December, 2007). Any land offset shall be enduring and be secured by a conservation mechanism which protects and manages the land in perpetuity. Where land offsets cannot solely achieve compensation for the loss of habitat, additional measures shall be provided to collectively deliver an improved or maintained biodiversity outcome for the region.

Where possible, specific priority shall be given to securing offset sites as near to the location of the impact/loss as possible to assist with the preservation of the specific endemic community of the area and assure that the ecological and amenity benefits of retaining endemic vegetation remain within the Local Government Area.

Where monitoring referred to in condition C1 indicates biodiversity outcomes are not being achieved, remedial actions, (such as improved land management measures or changes to the size and/or location of the offset area), shall be developed in consultation with OEH and the Department (Strategies and Land Release). Such remedial actions shall be documented under an addendum to the Biodiversity Offset Package and the addendum be submitted for the approval of the Director-General, prior to the implementation of that addendum.

1.3 CONSULTATION WITH OEH AND PLANNING AND INFRASTRUCTURE

The NSW Office of Environment and Heritage (OEH) and Planning and Infrastructure (formerly Department of Planning and Infrastructure (DP&I) were consulted by phone, e-mail and face to face meetings several times between February and November 2013 during the development of the BOP. The consultation included discussion regarding;

- The adequacy of the offset target committed to in the EA (OEH has stated that the proposed offset is adequate because it does not address indirect impacts).
- The proposed meeting of the offset commitment by the purchase and retirement of biodiversity credits from registered Biobank sites (OEH supported this option).
- The method to convert the number of hectares of offset required into an equivalent number of biodiversity credits by multiplying the area of offset required by the average number of credits generated per hectare of registered biobank site for each vegetation type (OEH supported this method).
- Where the required number and types of credits required were not reasonably available, making up the deficit by using alternative credits from the same vegetation formation consistent with the OEH Interim Major Projects Offset Policy (OEH 2011) (OEH supported this method).
- Need for a monitoring program (OEH agreed that the success of the offset sites did not need to be monitored by TfNSW if Biobanking credits were purchased as this was an obligation of the Biobank site owner and was covered by the annual reporting and audit provisions of the Biobank Agreements and the ability for the Minister for the Environment to withhold annual payments to Biobank site owners if the DG of OEH was not satisfied that the biobank sites were not being implemented in accordance with the Agreements).

Copies of e-mail exchanges and minutes of meetings held with OEH are included at **Appendix 2**.

1.4 RESPONSIBILITIES FOR THE IMPLEMENTATION OF THIS OFFSET PACKAGE

Transport NSW is responsible for meeting all of the commitments made in the BOP.

2 Offset Requirements and Identification of Options

2.1 IMPACTS OUTSIDE OF THE GROWTH CENTRES

Traditionally, offsets have been secured by purchasing private land with appropriate biodiversity values and then transferring and dedicating this land as a conservation area under the *National Parks and Wildlife Act* (NPW Act) 1974 (subject to the acceptance of the Minister for the Environment) or by registering an appropriate conservation covenant (e.g. Conservation Agreements under Section 69B of the NPW Act or Nature Conservation Trust Agreements under the *Nature Conservation Trust Act* 2001). Since 2008, the NSW Biobanking scheme has provided an alternative mechanism to secure conservation outcomes where land is not available for purchase or transfer to the NPWS estate. The Biobanking scheme is a conservation covenanting option that has been specifically designed to meet offset requirements for development situations and meets all of the principles of offsets in NSW (i.e. it is on title and provides secure funds for active conservation management in perpetuity).

In November 2010 the Director General of OEH introduced an interim policy for assessing and offsetting biodiversity impacts of Part 3A (and later Major Projects) developments (OEH 2011). The policy requires the use of a quantitative assessment methodology (and prefers the use of the Biobanking Assessment Methodology (BBAM) for benchmarking purposes) to determine the offset requirements of projects. Whilst the BBAM was not used for this project, a quantitative approach to quantify the impacts and offset requirements was used as outlined in the EA Report.

Notwithstanding the above, the OEH Interim Policy specifically acknowledges that proposals assessed as Major Projects under the EP&A Act do not have to meet the 'maintain or improve' standard which is required under the Biobanking Scheme. The approach taken by TfNSW is consistent with this policy. The quantitative approach has been used to inform the quantum of offset required only, and whilst it is OEHs preference that a Tier 1 'maintain or improve' outcome is achieved, the policy provides a structured approach for assessing proposals that meet one or two alternative standards (Tier 2 'no net loss' and Tier 3 'mitigated loss'), which take into consideration the environmental, social and economic benefits provided by the proposal.

A Tier 1 offset cannot be achieved for the proposal as the proposal will impact on four 'red flag' vegetation types – Blue Gum High Forest, Cumberland Plain Woodland, Shale Sandstone Transition Forest and Turpentine Ironbark Forest. The BBAM and OEH interim offset policy do however allow for 'red flag variations' and Tier 2 or 3 offset outcomes which achieves a minimum 2:1 offset to impact ratio.

A preliminary review of the Biobanking credit registers on the OEH website indicated that there were several registered Biobank sites that were capable of supplying the biobanking credits required to meet the offset requirements of the project.

Accordingly ELA converted the impacted vegetation types into the equivalent Biometric vegetation types (**Table 2**) so that the Biobanking credit registers could be reviewed in detail to determine whether the matching credit types were available to meet the offset commitments of the NWRL project (**Table 4**).

Table 2: Equivalent Biometric Vegetation types to impacted vegetation types

Vegetation Type Impacted	BioMetric Vegetation Type Equivalent	Vegetation Formation
Cumberland Plain Woodland	Grey Box - Forest Red Gum grassy woodland on shale of the southern Cumberland Plain (HN528)	Grassy Woodlands
River Flat Eucalypt Forest	Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin (HN526)	
Shale Sandstone Transition Forest	Narrow-leaved Ironbark - Broad-leaved Ironbark - Grey Gum open forest of the edges of the Cumberland Plain (HN556)	Dry Sclerophyll Forests (Shrub/grass sub-formation)
Coastal Shale Sandstone Transition Forest	Red Bloodwood - Smooth-barked Apple shrubby forest on shale or ironstone of coastal plateaux, Sydney Basin (HN567)	
Turpentine Ironbark Forest	Turpentine - Grey Ironbark open forest on shale in the lower Blue Mountains (HN604)	
Blue Gum High Forest	Sydney Blue Gum - Blackbutt - Smooth-barked Apple moist shrubby open forest on shale ridges of the Hornsby Plateau (HN596)	Wet Sclerophyll Forests (Shrubby sub-formation)

In order to convert the area commitments in the EA reports BOS to an equivalent number of biodiversity credits, the Biobank Agreement register was reviewed in November 2013 to extract all agreements with the corresponding vegetation types to determine the average number of credits generated per hectare at each Biobank site (**Table 3**). This number was then multiplied by the offset area commitment to determine the number of credits required to be purchased and retired to meet the offset obligations (**Table 4**). It is noted at the time of undertaking this exercise there were no registered Biobank Agreements with Turpentine Ironbark Forest (TIF) or Blue Gum High Forest (BGHF) to calculate the average for these vegetation types. For TIF, which is in the same vegetation formation as Shale Sandstone Transition Forest (SSTF), the average for this vegetation type was used (i.e. 9 credits per hectare). For BGHF, an average of 11 credits/ha based on a Biobank assessment currently being undertaken at Pyes Creek by Hornsby Council (Diane Campbell, Hornsby Council, pers. Comm.).

The results of this exercise indicated that 674 biodiversity credits needed to be purchased to meet the offset commitments for impacts outside of the Growth Centres in the EA report.

Following investigations of the availability of credits, two Biobank sites, Brownlow Hill Stage 2 (Agreement No. 88) and Summer Hill (Agreement No. 100) were found to have the required credit types and numbers of credits available to meet the offset requirements for impacts to Cumberland Plain Woodland (CPW), SSTF and River Flat Eucalypt Forest (RFEF). Based on discussions with OEH, SSTF credits (HN566) were used to meet the offset requirements for Coastal Shale Sandstone Transition Forest (CSSTF). This was on the basis that these two vegetation types are both within the Dry Sclerophyll Forest Formation and the SSTF credits are of a “like for like or better” status as they are a higher regional conservation priority as an endangered ecological community (EEC) than the non-threatened CSSTF (Consistent with Variation Criteria “f” of Attachment B of the Major Projects Offset Policy OEH 2011). Further, surplus CPW credits (HN528) were used to make up a short fall (36 of the 46 credits required) for RFEF (HN526) on the same basis (i.e. same Vegetation Formation and a higher regional conservation priority) (**Table 5**).

There were no registered Biobank sites or expressions of interest to register Biobank sites containing Blue Gum High and Turpentine Ironbark Forest.

Investigations of surplus operational land for the NWRL project and properties for sale were undertaken to determine if the offset requirements for the project could be met, however, no suitable land that would meet the Principles for Offset in NSW, in particular including the viability of the offset and ability to manage the offset to achieve improvements in biodiversity values, were found (Franklin Road) or were available to be used as an offset for the project (Mirvac owned land at West Pennant Hills).

Consultations with Hornsby Shire Council, Ku-Ring-Gai Council and Hills Shire Council were then undertaken to see if any Council land was available to be registered as a Biobank site and thus increase the level of protection to these areas and provide the resources necessary for long term conservation management. An approximately 10 ha site at Pyes Creek and New Farm Road (Hornsby LGA) was identified that contained 9.49 ha of BGHF. Council sought and obtained approval to proceed with the registration of the sites as Biobank sites. These credits have now been purchased and retired.

For the TIF offset, 10 credits were determined as being required. ME041 credits, which are part of the TIF community within the Sydney Metro IBRA region (adjacent to the Hawkesbury Nepean IBRA region) were acquired from Baulkham Hills Council and retired.

Table 3: Average number of credits generated per hectare of Biobank Site for impacted vegetation types

Cumberland Plain Woodland (HN528)	Agreement Number	Area (ha)	No. credits generated	No. Credits/ha
St Marys Towers	40	35.64	292	8.19
Brownlow Hill Stage 1	3	24.1	246	10.21
Summer Hill	100	4.89	60	12.27
WSPT (Cecil Hills)	70	22.8	240	10.53
WSPT (Chandos)	70	11.62	112	9.64
Historic Houses	58	10.72	94	8.77
Matae Dai	81	20.11	178	8.85
Mount Hercules	87	19.19	203	10.58
Brownlow Hill Stage 2	88	49.29	496	10.06
Holicombe (Mulgoa)	99	38.21	478	12.51
Average		236.57	2399	10.16
Shale Sandstone Transition Forest (HN566)	Agreement Number	Area (ha)	No. credits generated	No. Credits/ha
St Marys Towers	40	32.75	234	7.15
The Hills (Withers Road)	39	8.3	105	12.65
Historic Houses	58	40.1	342	8.53
Summer Hill	100	45.19	428	9.47
Average		126.34	1109	9.45
Alluvial River Flat Forest (HN526)	Agreement Number	Area (ha)	No. credits generated	No. Credits/ha
WSPT (Cecil Hills)	70	0.4	3	7.50
Brownlow Hill Stage 2	88	0.9	8	8.89
WSPT (Chandos)	70	5.69	68	11.95
Matae Dai	81	5.62	54	9.61
Holicombe (Mulgoa)	99	4.52	44	9.73
Average		17.13	177	9.54

Table 4: Equivalent biometric vegetation types and formations for NWRL impacted vegetation types

Vegetation Type Impacted	BioMetric Vegetation Type Equivalent	Vegetation Formation	Impacts outside of GCs* (ha)	Total Offset Proposed in EA Report (ha)	Average No. credits generated /ha	Number of Credits Required
Cumberland Plain Woodland	Grey Box - Forest Red Gum grassy woodland on shale of the southern Cumberland Plain (HN528)	Grassy Woodlands	13.88	51.22	10	512
River Flat Eucalypt Forest	Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin (HN526)		1.39	4.63	10	46
Shale Sandstone Transition Forest	Narrow-leaved Ironbark - Broad-leaved Ironbark - Grey Gum open forest of the edges of the Cumberland Plain (HN556)	Dry Sclerophyll Forests (Shrub/grass sub-formation)	0.78	2.34	9	21
Coastal Shale Sandstone Transition Forest	Red Bloodwood - Smooth-barked Apple shrubby forest on shale or ironstone of coastal plateaux, Sydney Basin (HN567)		1.33	5.75	9	52
Turpentine Ironbark Forest	Turpentine - Grey Ironbark open forest on shale in the lower Blue Mountains (HN604)		0.32	0.98	9	10
Blue Gum High Forest	Sydney Blue Gum - Blackbutt - Smooth-barked Apple moist shrubby open forest on shale ridges of the Hornsby Plateau (HN596)	Wet Sclerophyll Forests (Shrubby sub-formation)	1.01	3.03	11	33
			18.71	67.95	9.25	674

2.2 IMPACTS WITHIN THE GROWTH CENTRES

The NWRL project will impact on 0.65 ha of non-certified Existing Native Vegetation (ENV) in the Sydney Growth Centres (0.08 of Cumberland Plain Woodland and 0.57 ha of River Flat Eucalypt Forest) (ELA 2012).

This impact is required to be offset in accordance with biodiversity measures 8 and 11 of the biodiversity certification order, which allows the:

- *Protection of an equal or greater area of ENV elsewhere in the Growth Centres (certified lands) or in the Cumberland Plain area of western Sydney (if the DP&I is satisfied that there are no practical offset options within Growth Centres and all other requirements of biodiversity measure 8 will be met), or*
- *The revegetation/restoration of an area of land within the Growth Centres (certified or non-certified lands) or in the Cumberland Plain area of western Sydney (if offsetting within Growth Centres is not practical), at a ratio of at least 3:1, with the amount to be allocated towards the offset calculated by dividing the total area of revegetation and/or restoration by 3.*

Under the biodiversity certification order, the vegetation type used to provide the offset does not have to relate directly to that being impacted, rather impacts to ENV need to be replaced with an equal or greater amount of ENV. If the offset consisted entirely of ENV 0.65 ha of offset would have been required. However, with restoration and revegetation, the project requires 1.95 ha of offset.

Western Sydney Parklands Trust (WSPT) have utilised the Biobanking Scheme to create Biobank sites in strategic locations within their lands, with the intention of building on existing native vegetation and connecting patches of good condition vegetation throughout the parklands. The Biobank sites are therefore:

- Viable and persistent for a long time period as they will be well connected to existing areas of good condition vegetation
- Part of large contiguous patches
- Contiguous with non-certified areas
- Secured and managed in perpetuity, with adequate funding held in the Biobanking Trust Fund
- Targeted within the WSPT draft 'Bushland Corridor' areas, which identify priority areas for revegetation and restoration within the Western Sydney Parklands.

The projects Growth Centres Offset requirement is equivalent to 20 ecosystem credits (based on an average of 10 restoration credits generated per hectare of revegetation/restoration over 1.95 ha at WSPT biobank sites). TfNSW have purchased 20 ME019 credits from WSPT, and these have now been retired.

3 Proposed Offset Package

3.1 OFFSET LOCATIONS

Based on the availability of registered, or in the process of being registered, Biobank sites that have the required credit types, it is proposed to meet the full offset requirement of the NWRL project by the purchase and retirement of 694 biodiversity credits (including requirements for impacts within the Growth Centres) as outlined in **Table 4** and **Section 2.2**.

TfNSW has purchased (secured) 631 credits and retired 504 of these credits, from the Brownlow Hill and Summer Hill Biobank sites in March 2013 (**Table 5** – cells without a date). A register of the credits held by TfNSW is provided in **Appendix 3** and a certificate of the retirement of 631 credits from the Brownlow Hill Biobank site is at **Appendix 4**.

Subsequent to the above the remaining credits required were obtained from the Pyes Creek site (Hornsby Council), Baulkham Hills biobank site, and the Western Sydney Parklands Trust (WSPT – for offsets associated with impacts within the Growth Centres). The remaining biobanking credits were required in one batch in November 2016. This consisted of 127 credits (54 and 73 credits) from the Brownlow Hill and Summer Hill Biobank sites, and 63 credits for the remaining vegetation types (33, 20 and 10 credits), as provided at **Appendix 5**.

Whilst an exact ‘like for like’ matching of all vegetation types has not been achieved, the surplus Cumberland Plain Woodland and Shale Sandstone Forest credits are able to be used to meet the offset requirement for River Flat Eucalypt Forest and Coast Shale Sandstone Forest consistent with the OEH Interim Major Projects Offset Policy as they are the same vegetation formation (refer to variation criteria ‘f’) and are consistent with discussions held with OEH (**Appendix 2**).

The location of these offset properties in relation to the NWRL alignment are shown in **Figure 1**.

Subsequent to the above the offsets required for the Cheltenham site were assessed using the new Biodiversity Assessment Method (refer to Appendix 6), and are intended to be offset through payment to the Biodiversity Conservation Trust.

3.2 LONG TERM PROTECTION AND MANAGEMENT OF PROPOSED OFFSET PROPERTIES

As each offset property is a registered Biobank site, they are (or will be) protected in perpetuity via the registration of a Biobank Agreement on title and have funds to actively manage and enhance biodiversity values in perpetuity via the Biobanking Trust Fund.

The owners of each Biobank site are required to manage and report on the management of the Biobank site in accordance with the terms of the agreement. The Minister for the Environment may withhold the payment of annual management funds if the Director General of OEH is not satisfied that the sites are being managed appropriately and/or make arrangements for third parties to manage the site with the funds held in Trust.

For this reason, it is not necessary for TfNSW to make arrangements to monitor and report on the effectiveness of the offset sites as required by CoA C5 (d).

Table 5: Status of credit purchasers and retirement

BioMetric Vegetation Type Equivalent	Vegetation Formation	Number of Credits Required	Credits to be Purchased and Retired								Total credits Purchased and/or Retired
			Brownlow Hill		Summer Hill		Pyes Creek		Baulkham Hills Biobank Site		
			Credits Purchased	Credits Retired	Credits Purchased	Credits to be Retired	Credits Purchased	Credits Retired	Credits Purchased	Credits Retired	
Grey Box - Forest Red Gum grassy woodland on shale of the southern Cumberland Plain (HN528)	Grassy Woodlands	512	496	496	60	16 (in 2016)					512
Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin (HN526)		46	8	8		38 (in 2016 using HN528)					46
Narrow-leaved Ironbark - Broad-leaved Ironbark - Grey Gum open forest of the edges of the Cumberland Plain (HN556)	Dry Sclerophyll Forests (Shrub/grass subformation)	21			250	21 (in 2016)					21
Red Bloodwood - Smooth-barked Apple shrubby forest on shale or ironstone of coastal plateaux, Sydney Basin (HN567)		52				52 (in 2016 using HN556)					52
Turpentine - Grey Ironbark open forest on shale in the lower Blue Mountains (HN604)		10							10	10 (in 2016)	10
Sydney Blue Gum - Blackbutt - Smooth-barked Apple moist shrubby open forest on shale ridges of the Hornsby Plateau (HN596)	Wet Sclerophyll Forests (Shrubby subformation)	33						33	33 (in 2016)		33
		674	504	504	310	127	33	33	10	10	674

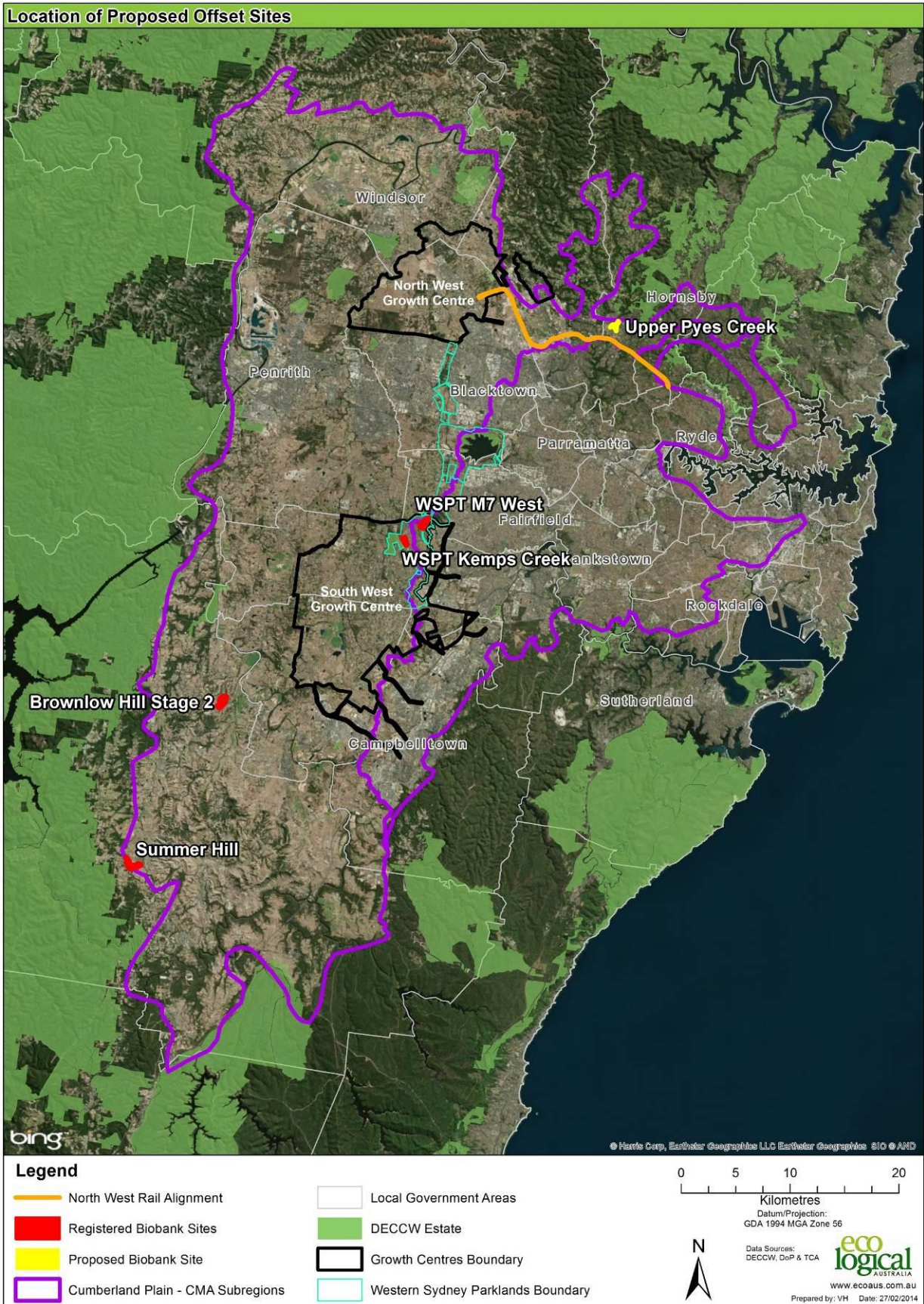


Figure 1: Location of proposed offset properties for the NWRL Project

4 Consistency of Proposed Offset Package with CoA and Offset Principles

4.1 CONSISTENCY WITH CONDITIONS OF APPROVAL

Table 6 provides a summary of the relevant conditions from the EP&A Act approval and identifies how and where they have been addressed in this BOP.

Table 6: Conditions of approval and where dealt with in this report

Condition of Approval	Where/How addressed in this Package
Developed and submitted to the Director General within 12 months of the commencement of construction, or otherwise as agreed to by the Director General.	Construction commenced on 28 May 2013. This package was submitted to the Director General for approval in April 2014
The package shall detail how the ecological values lost as a result of the SSI will be offset	Addressed in Section 2
The package shall be developed in consultation with OEH and the Department (Strategies and Land Release)	OEH and Department of Planning and Infrastructure were consulted during development of package as outlined in Section 1.3 and Appendix 2
a) the identification of the extent, types and condition of habitat that shall be lost or degraded as a result of the SSI, including the consideration of indirect impacts on adjacent retained vegetation and impacts caused through weed incursion and other potential edge effects;	Outlined in Section 1.1 and 2. The Biodiversity Offset Strategy in the EA proposed to offset the direct impacts, but did not propose to offset indirect impacts due to the mitigation measures proposed, and this BOP is consistent with the approved EA.
b) the objectives and outcomes necessary to address impacts on all native flora and fauna species and vegetation communities located in the North West Growth Centre, but not certified under the Biodiversity Certification Order, or located on land outside of the North West Growth Centre;	Outlined in Section 2.2 and Table 1
c) the final suite of the biodiversity offset measures selected and secured in accordance with the Biodiversity Offset Strategy;	Outlined in Section 3 and 5
d) the management and monitoring requirements for compensatory habitat works and other biodiversity offset measures proposed to ensure the outcomes of the package are achieved, including: <ul style="list-style-type: none"> i) the monitoring of the condition of species and ecological communities at offset locations; ii) the methodology for the monitoring program(s), including the number and location of offset monitoring sites, and the sampling frequency at these sites; iii) provisions for the annual reporting of the monitoring results for a set period of time as determined in consultation with the OEH. 	Not relevant as all offsets are secured as Biobank sites and it is the responsibility of the Biobank site owner to report annually to the Director General of the OEH on the implementation of management actions as outlined in each Biobank Agreement.

Condition of Approval	Where/How addressed in this Package
e) timing and responsibilities for the implementation of the provisions of the Package	TfNSW is responsible for the implementation of the provisions of the Package (Section 1.4) and the timing (Section 5)
Land offsets shall be consistent with the Principles for the use of Biodiversity Offsets in NSW	Addressed in Section 4.2
In relation to areas of non-certified ENV within the North West Growth Centre, offset requirements must be consistent with the Growth Centres Biodiversity Certification Order	Addressed in Section 2.2
Any land offset shall be enduring and be secured by a conservation mechanism which protects and manages the land in perpetuity	All offsets have been secured by Biobanking Agreements as outlined in Section 3. Biobanking Agreements are registered on title and protect and manage land in perpetuity.
Specific priority shall be given to securing offset sites as near to the location of the impact/loss as possible to assist with the preservation of the specific endemic community of the area and assure that the ecological and amenity benefits of retaining endemic vegetation remain within the Local Government Area (LGA)	Priority has been given to protecting, where possible and practical, offsets as close as possible to the impact sites, including for some vegetation types, within the same LGA as the impact area. In all cases, offsets have been secured within the same CMA region.
Where monitoring referred to in condition C1 indicates biodiversity outcomes are not being achieved, remedial actions, (such as improved land management measures or changes to the size and/or location of the offset area), shall be developed in consultation with OEH and the Department	Condition C1 relates to the Ecological Monitoring Program addressing the effectiveness of the mitigation measures and the consistency of the assessed impacts with the actual impacts. At the time of preparing this BOP, the first annual report of this program was not available. A commitment to adjust this offset package should the monitoring program indicate that offsets are greater than assessed, is made in Section 5.

4.2 CONSISTENCY WITH NSW OFFSET PRINCIPLES

The following section assesses the proposed offset package compared with the NSW offsetting principles (DECC 2008).

1. *Impacts must be avoided first by using prevention and mitigation measures.*

Offsets are then used to address remaining impacts. This may include modifying the proposal to avoid an area of biodiversity value or putting in place measures to prevent offsite impacts.

The avoidance and mitigation measures for the NWRL project are outlined in Section 5 of the EA report. Consistent with CoA C1, these mitigation measures are being monitored for their effectiveness.

2. *All regulatory requirements must be met.*

Offsets cannot be used to satisfy approvals or assessments under other legislation, e.g. assessment requirements for Aboriginal heritage sites, pollution or other environmental impacts (unless specifically provided for by legislation or additional approvals).

The development proposal has been prepared in accordance with the Director General's requirements issued for a State Significant Infrastructure (SSI) and was approved in September 2012.

3. *Offsets must never reward ongoing poor performance.*

Offset schemes should not encourage landholders to deliberately degrade or mismanage offset areas in order to increase the value from the offset.

The proposed offsets areas have not been mismanaged in order to increase their value. They were assessed by accredited assessors and audited by OEH officers in a separate process(es) to the ecological assessment for the NWRL project.

4. *Offsets will complement other government programs.*

A range of tools is required to achieve the NSW Government's conservation objectives, including the establishment and management of new national parks, nature reserves, state conservation areas and regional parks and incentives for private landholders.

The proposed offset package includes the purchase of credits from two privately owned Biobank sites and two Government Authorities (Western Sydney Parkland Trust and Hornsby Council). The offset package complements other government programs by adding to and enhancing the conservation values of identified regional conservation priorities on private and government land.

5. *Offsets must be underpinned by sound ecological principles.*

They must:

- *Include the consideration of structure, function and compositional elements of biodiversity, including threatened species*
- *Enhance biodiversity at a range of scales*
- *Consider the conservation status of ecological communities*

- *Ensure the long-term viability and functionality of biodiversity.*

Biodiversity management actions, such as enhancement of existing habitat and securing and managing land of conservation value for biodiversity, can be suitable offsets. Reconstruction of ecological communities involves high risks and uncertainties for biodiversity outcomes and is generally less preferable than other management strategies, such as enhancing existing habitat.

The proposed offset package has been determined using quantitative assessment methodologies, have been specifically targeted to address the communities being impacted by the NWRL project on a 'like for like or better' basis. The properties identified in the proposed offset package have been selected based on their area, location and condition to achieve a viable conservation area. The proposed package provides the funding to manage these sites in perpetuity.

6. Offsets should aim to result in a net improvement in biodiversity over time.

Enhancement of biodiversity in offset areas should be equal to or greater than the loss in biodiversity from the impact site.

Setting aside areas for biodiversity conservation without additional management or increased security is generally not sufficient to offset against the loss of biodiversity. Factors to consider include protection of existing biodiversity (removal of threats), time-lag effects, and the uncertainties and risks associated with actions such as revegetation.

Offsets may include enhancing habitat, reconstructing habitat in strategic areas to link areas of conservation value, or increasing buffer zones around areas of conservation value and removal of threats by conservation agreements or reservation.

The proposed offset areas are larger than the area to be impacted and have been determined using quantitative methods. Whilst not addressing a full improve or maintain outcome, the overall offset ratio achieved is 3.63:1 and is significantly higher than the minimum 2:1 ratio specified for a Tier 3 offset in the Major Project Offsets Policy.

7. Offsets must be enduring & they must offset the impact of the development for the period that the impact occurs.

As impacts on biodiversity are likely to be permanent, the offset should also be permanent and secured by a conservation agreement or reservation and management for biodiversity. Where land is donated to a public authority or a private conservation organisation and managed as a biodiversity offset, it should be accompanied by resources for its management. Offsetting should only proceed if an appropriate legal mechanism or instrument is used to secure the required actions.

All proposed offset areas are, or will, be secured by registration of an in perpetuity Biobank Agreement.

8. Offsets should be agreed prior to the impact occurring.

Offsets should minimise ecological risks from time-lags. The feasibility and in-principle agreements to the necessary offset actions should be demonstrated prior to the approval of the impact. Legal commitments to the offset actions should be entered into prior to the commencement of works under approval.

The proposed Biodiversity Offset Strategy formed part of the environmental assessment for the NWRL project, and this BOP is consistent with the approved strategy. Securing the offset

package within 12 months of the commencement of construction activities is a condition of development consent.

9. *Offsets must be quantifiable & the impacts and benefits must be reliably estimated.*

Offsets should be based on quantitative assessment of the loss in biodiversity from the clearing or other development and the gain in biodiversity from the offset. The methodology must be based on the best available science, be reliable and used for calculating both the loss from the development and the gain from the offset. The methodology should include:

- *The area of impact*
- *The types of ecological communities and habitat/species affected*
- *Connectivity with other areas of habitat/corridors*
- *The condition of habitat*
- *The conservation status and/or scarcity/rarity of ecological communities*
- *Management actions*
- *Level of security afforded to the offset site.*
- *The best available information/data should be used when assessing impacts of biodiversity loss and gains from offsets. Offsets will be of greater value where:*
 - *They protect land with high conservation significance*
 - *Management actions have greater benefits for biodiversity*
 - *The offset areas are not isolated or fragmented*
 - *The management for biodiversity is in perpetuity (e.g. secured through a conservation agreement).*
 - *Management actions must be deliverable and enforceable.*

The offset area requirement has been calculated using a quantitative methodology that has taken into consideration the area of impact, the vegetation types, vegetation condition, species, and connectivity. The calculations for the proposed offset areas have also taken into consideration area, the vegetation types, vegetation condition, species, connectivity, level of protection, required management actions.

10. *Offsets must be targeted.*

They must offset impacts on the basis of like-for-like or better conservation outcome. Offsets should be targeted according to biodiversity priorities in the area, based on the conservation status of the ecological community, the presence of threatened species or their habitat, connectivity and the potential to enhance condition by management actions and the removal of threats. Only ecological communities that are equal or greater in conservation status to the type of ecological community lost can be used for offsets. One type of environmental benefit cannot be traded for another: for example, biodiversity offsets may also result in improvements in water quality or salinity but these benefits do not reduce the biodiversity offset requirements.

The proposed offset package has been targeted based on a '*like for like or better*' conservation outcome and is consistent with OEH (2011) interim policy on assessing and offsetting biodiversity impacts of Major Projects.

11. Offsets must be located appropriately.

Wherever possible, offsets should be located in areas that have the same or similar ecological characteristics as the area affected by the development.

Given the urban context of the project area it has not been possible to secure all offsets, or desirable to secure all offsets in areas with the same ecological characteristics impacted by the project due to the need to ensure that offsets will be viable in the long term and are capable of achieving the predicted gains in biodiversity value. Offsets however are on a like for like or better basis and are within the same CMAs as the impacts.

12. Offsets must be supplementary.

They must be beyond existing requirements and not already funded under another scheme. Areas that have received incentive funds cannot be used for offsets. Existing protected areas on private land cannot be used for offsets unless additional security or management actions are implemented. Areas already managed by the government, such as national parks, flora reserves and public open space cannot be used as offsets.

The proposed offset package is supplementary. The proposed offset properties are currently zoned rural (Brownlow Hill, Summer Hill and WSPT) or have no specific obligation to manage for biodiversity conservation or where this is some obligation, the number of credits generated may be discounted (Hornsby Council Biobank site), therefore all management actions applied will be supplementary.

13. Offsets and their actions must be enforceable through development consent conditions, licence conditions, conservation agreements or a contract.

Offsets must be audited to ensure that the actions have been carried out, and monitored to determine that the actions are leading to positive biodiversity outcomes.

The delivery of the proposed offset package will be enforceable through the condition of approval for the project. Further, for Biobank sites it is the responsibility of the Biobank site owner to report annually to the Director General of the OEH on the implementation of management actions as outlined in each Biobank Agreement.

5 Statement of Commitments

Condition of Approval C5 requires the offset package to be prepared and secured within 12 months of the commencement of construction (i.e. 28 May 2014), or as otherwise agreed to by the Director General.

As indicated in Section 3 of this report, 631 of the required 694 biodiversity credits were purchased by TfNSW and 504 of these retired (i.e. that offset component is secured) in March 2013. Acquisition of the remaining 63 required credits took some time, due to delays until the Pyes Creek and Western Sydney Parklands Biobank sites became registered. The remaining 127 credits originally acquired, and the subsequently acquired 63 credits, were all retired in one batch in November 2016.

In the previous version of this Biodiversity Offset Package identified that TfNSW committed to the following (with comment on status in italics underneath):

1. To purchase an additional 20, 33 and 10 ecosystem credits from the WSPT, Hornsby Shire Council and Hills Shire Council respectively as indicated in **Table 5** once available and provide proof of purchase and retirement of these credits by providing a copy of the credit transfer and retirement certificates to DP&I and OEH.

These credits were retired by TfNSW in November 2016.

2. Retire these credits, as well as the 127 credits already purchased from the Summer Hill Biobank site and provide proof of this credit retirement to the Director General.

These credits were retired by TfNSW in November 2016.

3. Subject to the findings of the Ecological Monitoring Program (CoA C1), purchase and retire any additional credits at the rates outlined in Table 3 should the monitoring reports indicated that impacts have exceeded those outlined in the EA Report.

The credits required for the Cheltenham Oval Community Facility, which exceeds the impacts outlined in the EA report, have been determined and there has been consultation with OEH on the method used. TfNSW has committed to making payment to the Biodiversity Conservation Trust to satisfy these credits requirements.

References

DECC (2008). *Principles for the use of biodiversity offsets in NSW*. Online <http://www.environment.nsw.gov.au/biocertification/offsets.htm> (Accessed 22 July 2009).

ELA (2012) Ecological Assessment for the North West Rail Link. Report prepared for Transport for NSW by Eco Logical Australia Pty Ltd, March 2012.

OEH (2011) *NSW OEH Interim policy on assessing and offsetting biodiversity impacts of Part 3A, State significant development (SSD) and State significant infrastructure (SSI) projects*. NSW Office of Environment & Heritage, Sydney, 25 June 2011.

Appendix 1: Ecological Assessment Report Biodiversity Offset Strategy

Provided as a separate document.

Appendix 2: Consultation with OEH and DP&I

Correspondence with OEH February 2013

From: Sarah Burke [<mailto:Sarah.Burke@environment.nsw.gov.au>]
Sent: Wednesday, 20 February 2013 5:17 PM
To: Robert Humphries
Cc: Susan Harrison
Subject: RE: North West Rail Link Offset Package Query

Hi Rob

I've spoken to Susan and we think you've provided enough information for us to be able to give in principle support to what you're proposing. Our interim offsetting policy for SSD/SSI does allow some swaps between vegetation types when seeking credits, in some circumstances. But there are a few provisos to note before full support can be given:

- as discussed, the policy states that credits for one veg type can be converted into another veg type within the same veg formation in the same IBRA bioregion. CSSF and SSTF are in the same veg formation, so this swap meets the policy. However, SSTF and RFEF are not in the same formation. But CPW and RFEF are in the same veg formation so it would be possible to swap CPW credits for RFEF.
- if excess CPW are used for RFEF, I calculate a shortfall of 1.08 ha of RFEF (see attached – second table). This shortfall would need to be addressed. I understand the exact number of credits required and generated is unknown at the moment and depends somewhat on the veg condition and the number of credits generated per hectare. If there is a shortfall in RFEF hectares but there are sufficient numbers of credits, that should be acceptable given it meets the BBAM.
- according to the policy, the credit swap you're proposing can only occur where there are no matching credits available. Although there are no CSSF (HN567) credits available on the register, I note there are RFEF (HN526) credits available (at Western Sydney Parklands). So justification would need to be provided as to why these credits couldn't be purchased.

Happy to discuss further if required

thanks

Sarah

Sarah Burke | Regional Biodiversity Conservation Officer | Regional Operations Group | Office of Environment & Heritage | NSW Department of Premier & Cabinet | L7, 79 George St (PO Box 668) Parramatta 2124 | T: 9995 6848 | F: 9995 6900 | W: www.environment.nsw.gov.au

From: Sarah Burke [<mailto:Sarah.Burke@environment.nsw.gov.au>]
Sent: Friday, 15 February 2013 2:07 PM
To: Robert Humphries

Cc: Susan Harrison

Subject: RE: North West Rail Link Offset Package Query

Hi Rob

if we just deal with credits required (rather than hectares), is the following correct?

	credits required	credits generated			
		Brownlow Hill	Oaklands	excess without swaps	excess with swaps
CPW	510	496	60	46	46
SSTF	17		423	406	332 (40 to CSSTF and 34 to RFEF)
CSSTF	40			-40	0
RFEF	42	8		-34	0
total	609	504	483	378	378

If that is correct, instead of your proposal to use excess SSTF credits to make up the shortfall in RFEF credits, are there enough excess CPW credits that could be used for RFEF? This may be preferable given CPW and RFEF are in the same veg formation.

we'll get back to you soon on whether a meeting is required

thanks Sarah

Sarah Burke | Regional Biodiversity Conservation Officer | Regional Operations Group | Office of Environment & Heritage | NSW Department of Premier & Cabinet | L7, 79 George St (PO Box 668) Parramatta 2124 | T: 9995 6848 | F: 9995 6900 | W: www.environment.nsw.gov.au

From: Robert Humphries [<mailto:roberth@ecoaus.com.au>]

Sent: Friday, 15 February 2013 12:38 PM

To: Harrison Susan; Burke Sarah

Cc: Bourke, Peter; Steven Ward

Subject: North West Rail Link Offset Package Query

Hello Susan and Sarah

As discussed briefly, we are currently putting together the offset package for the NWRL approval (Approval condition copied below).

Biodiversity Offset Package C5. Within twelve months of the commencement of construction, or as otherwise agreed to by the Director General, the Proponent shall develop and submit a Biodiversity Offset Package for the approval of the Director General. The Package shall detail how the

ecological values lost as a result of the SSI will be offset. The Package shall be developed in consultation with OEH and the Department (Strategies and Land Release) and shall (unless otherwise agreed by the Director General) include, but not necessarily be limited to: a) the identification of the extent, types and condition of habitat that shall be lost or degraded as a result of the SSI, including the consideration of indirect impacts on adjacent retained vegetation and impacts caused through weed incursion and other potential edge effects; b) the objectives and outcomes necessary to address impacts on all native flora and fauna species and vegetation communities located in the North West Growth Centre, but not certified under the Biodiversity Certification Order, or located on land outside of the North West Growth Centre; c) the final suite of the biodiversity offset measures selected and secured in accordance with the Biodiversity Offset Strategy; d) the management and monitoring requirements for compensatory habitat works and other biodiversity offset measures proposed to ensure the outcomes of the package are achieved, including: i) the monitoring of the condition of species and ecological communities at offset locations;

ii) the methodology for the monitoring program(s), including the number and location of offset monitoring sites, and the sampling frequency at these sites;

iii) provisions for the annual reporting of the monitoring results for a set period of time as determined in consultation with the OEH; and e) timing and responsibilities for the implementation of the provisions of the Package.

Land offsets shall be consistent with the Principles for the use of Biodiversity Offsets in NSt4/. Notwithstanding, in relation to areas of non-certified ENV within the North West Growth Centre, offset requirements must be consistent with the Growth Centres Biodiversity Certification Order (December, 2007). Any land offset shall be enduring and be secured by a conservation mechanism which protects and manages the land in perpetuity. Where land offsets cannot solely achieve compensation for the loss of habitat, additional measures shall be provided to collectively deliver an improved or maintained biodiversity outcome for the region.

Where possible, specific priority shall be given to securing offset sites as near to the location of the impact/loss as possible to assist with the preservation of the specific endemic community of the area and assure that the ecological and amenity benefits of retaining endemic vegetation remain within the Local Government Area.

Where monitoring referred to in condition C1 indicates biodiversity outcomes are not being achieved, remedial actions, (such as improved land management measures or changes to the size and/or location of the offset area), shall be developed in consultation with OEH and the Department (Strategies and Land Release). Such remedial actions shall be documented under an addendum to the Biodiversity Offset Package and the addendum be submitted for the approval of the Director-General, prior to the implementation of that addendum.

The EPBC Act offset requirement for impacts to CPW has been met via purchase of 49 ha of CPW (496 biodiversity credits) from the Brownlow Hill Stage 2 Biobank Site (Biobank Agreement No 88 registered

in January 2012). This site also includes 0.9 ha of Alluvial Forest for which all the credits have also been purchased (8).

The EA report committed to an offset package of 67.95 ha as shown in the Table below.

Where possible we are proposing to purchase and retire an equivalent number of Biodiversity credits from registered Biobank sites to meet the offset requirements (calculated by converting the area commitment to the number of credits by multiplying the number of credits generated per ha). This will meet the NSW Offset Principles as outlined in the EA report as the offsets will be permanently protected, managed in perpetuity and subject to annual reporting, compliance and audit.

VEGETATION COMMUNITY IMPACTED	TOTAL OFFSET PROPOSED (HA)	ESTIMATE OF CREDITS REQUIRED
Cumberland Plain Woodland	51.22	510
Shale Sandstone Transition Forest	2.34	17
Coastal Shale Sandstone Transition Forest	5.75	40
River Flat Eucalypt Forest	4.63	42
Blue Gum High Forest	3.03	26
Turpentine Ironbark Forest	0.98	10
Total Credits Generated (est)	67.95	645

We have identified a second 53 ha biobank site at Oaklands (Wollondilly LGA) (formal Biobank assessment nearing completion for submission to OEH for registration in March). This Biobank Site will generate 525 credits including 4.8 ha of CPW and 45.56 ha of SSTF.

Vegetation name	Area (ha)	Credits	Credits/ha
Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin (CPW EEC)	4.87	60	12
Grey Myrtle - Lilly Pilly dry rainforest in dry gullies, Sydney Basin and South East Corner	1.25	15	12
Narrow-leaved Ironbark - Broad-leaved Ironbark - Grey Gum open forest of the edges of the Cumberland Plain, Sydney Basin (SSTF EEC)	24.58	166	7
Narrow-leaved Ironbark - Broad-leaved Ironbark - Grey Gum open forest of the edges of the Cumberland Plain, Sydney Basin (SSTF EEC)	20.98	257	12

Smooth-barked Apple - Red Bloodwood - Sydney Peppermint heathy open forest in sandstone gullies of western Sydney, Sydney Basin (Sydney Western Sandstone Gully Forest)	3.05	27	9
	54.73	525	

We are proposing to use the CPW credits to make up the short fall in the EA commitments and the SSTF to meet the SSTF (2.34 ha), Coastal Shale Sandstone Transition Forest (5.75) and remaining River Flat Eucalypt Forest (4.63 – 0.9 ha = 3.73 ha) i.e. the equivalent of 11.82 ha of SSTF credits and 2.22 ha of CPW credits will be used to meet the remaining offset commitments other than Blue Gum High and Turpentine Ironbark Forest.

We note that whilst this proposal is not precisely the same proportions as committed to in the offset strategy, we note that substitution of River Flat Eucalypt Forest offsets for SSTF or Coastal Transition Forest for SSTF is an equivalent conservation status (i.e. EEC for EEC) or better conservation status (non EEC for EEC).

BGHF and STIF offsets are currently being investigated in the Ku-ring-gai, Hornsby and Baulkham Hills areas.

There is also a small impact on the non certified parts of the Growth Centres that will be met in accordance with the certification order (most likely via purchase of credits from Western Sydney Parklands for which we are also currently preparing a Biobank Agreement for.

Before TfNSW enters into an options agreements to secure the credits stated above from the Oaklands site, we would like to discuss with OEH (and DoP&I if necessary) whether this is likely to be acceptable to OEH in regard to the condition of approval. This can then be formalised by submission of the Offset Package requirement of the condition of approval.

Could you please advise whether you are able to respond to this with the information above or whether you are available for a meeting next week (18-22 Feb) to discuss. If a meeting is required can we confirm a date early in the week ASAP.

Thank you

Robert Humphries

Manager BioBanking and Offsets Programs

Manager RTO Training Services

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Correspondence November 2013

From: Robert Humphries

Sent: Wednesday, 6 November 2013 1:42 PM

To: 'Rebecca.sommer@planning.nsw.gov.au'; susan.harrison@environment.nsw.gov.au; Sarah Burke (sarah.burke@environment.nsw.gov.au)

Cc: Bourke, Peter; Steven Ward

Subject: Request for meeting to discuss progress in regards to Biodiversity Offset Package for North West Rail Link Project (Condition C5)

Hello Rebecca/Susan and Sarah

As you are aware, the condition of approval for the above project requires the development of a Biodiversity Offset Package to be submitted to the DG of Planning within 12 months of approval.

The package is to be developed in consultation with OEH and the DP&I.

TfNSW has engaged Eco Logical Australia to develop and secure these offsets.

We would like to arrange a meeting to discuss progress with meeting the offset commitments made in the Environment Assessment report (as required by condition C5) before finalising the proposed package.

Could you please advise if you are available to meet in the week of 18th November (other than the morning on Monday and Tuesday 18-19). I expect that the meeting would be approximately 1 hour in duration and would be held at either OEHs offices in Parramatta or DP&I office in city (assuming this is your office location Rebecca).

We have previously been in contact with Sarah Burke regarding the purchase and retirement of biodiversity credits from the Brownlow Hill and Summerhill Biobank sites for part of the package (Cumberland Plain Woodland and Shale Sandstone Transition Forest impacts) and these have now been secured and have entered into arrangements with the Western Sydney Parklands Trust (for impacts to non-certified ENV within the Growth Centres) and Hornsby Council to purchase and retirement of credits from Biobank assessments currently underway.

Regards

Robert Humphries

Manager BioBanking and Biocertification Offsets Programs

Manager RTO Training Services

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Correspondence November 2013

From: Robert Humphries

Sent: Wednesday, 27 November 2013 11:57 AM

To: Rebecca.sommer@planning.nsw.gov.au

Cc: susan.harrison@environment.nsw.gov.au; Sarah Burke (sarah.burke@environment.nsw.gov.au); Bourke, Peter; Steven Ward

Subject: Minutes of NWRL Offset Package Consultation meeting with OEH, Tuesday 19 November

Dear Rebecca

As requested please find attached a copy of the outcomes of TfNSW offset package consultation/update meeting with OEH.

Sarah/Susan could you please review and provide comments (as necessary) if I have not captured your comments accurately. Thank you

Peter Bourke and I met with Susan Harrison and Sarah Burke of OEH on Tuesday 19th November 2013 at OEHs Parramatta office between 2 and 3pm to discuss progress with developing/finalising the offset package for the North West Rail Link (NWRL) Project as per condition C5 of the project approval for SSI-5100.

The package is to be finalised within 12 months of the commencement of construction i.e. 28 May 2014.

An agenda and relevant background information was sent on Friday 15th November including the Biodiversity Offset Strategy and Statement of Commitments from the project Environment Assessment Report (EA report) and a summary table of these commitments converted to an equivalent number of biodiversity credits established under the NSW Biobanking Scheme for which TfNSW intends to purchase and retire to meet the stated offset obligation.

The meeting commenced with Robert Humphries of Eco Logical Australia providing a statement as to the projects commitments and how the equivalent number of biodiversity credits for the hectare area of offset commitment was determined (i.e. by multiplying the area commitment by the average number of credits generated at all registered Biobank sites for each of the required vegetation types where available – see attached spread sheet titled NWRL Offset sites_141113).

OEH advised that they supported the proposed method of achieving the offset requirements (i.e. purchase and retirement of biodiversity credits from registered biobank sites) and the method that the required number of credits was determined, however, repeated their previous comments to DP&I that the Offset Strategy in the EA report did not calculate the offset requirements using improve or maintain (IoM) methods and had not addressed indirect impacts to OEHs satisfaction.

TfNSW advised that we would discuss the offset commitment with DP&I as the approval authority.

Robert Humphries then provided a summary of the offsets secured to date for impacts to Cumberland Plain Woodland (CPW), River Flat Eucalypt Forest (RFEF), Shale Sandstone Transition Forest (SSTF) and Coastal Shale Sandstone Transition Forest (CSSTF) which have been achieved by the purchase and retirement of 631 biodiversity credits from the Brownlow Hill Stage 2 and Summerhill Biobank sites in the Wollondilly LGA as outlined in the attached spread sheet.

It was noted that there was an insufficient number of River Flat Eucalypt Forest (Brownlow Hill only provided 8 of the 46 required), however, the deficit is proposed to be made up with a surplus of Cumberland Plain Woodland credits which are in the same vegetation formation (and a higher conservation status) and therefore consistent with OEHs interim offset policy for SSI projects (see attached). The Coastal Shale Sandstone Transition Forest credits are also made up by the equivalent (or higher conservation status) Shale Sandstone Transition Forest credits.

Some discussion was held as to whether OEH would consider further retirement of SSTF credits for the Sydney Turpentine Ironbark Forest (STIF) requirements as these were also in the same vegetation formation. OEH did not support this proposition given the higher conservation status of STIF.

OEH however pointed out that the interim offset policy for major projects should not be used if the initial offset calculations did not follow IoM methodology.

TfNSW response is that the OEH interim offset policy for Major Projects, including SSI, allows a proponent to propose a Tier 3 offset which allows these substitutions where the project provides significant social and economic benefits and meets a minimum 2:1 offset ratio.

Regardless of whether or not full IoM calculations have been undertaken, the offset package proposed in the EA report significantly exceeds this 2:1 minimum and provides an offset to impact ratio of 3.63:1.

Offset for impacts to Blue Gum High Forest (BGHF) and Sydney Turpentine Ironbark Forest (STIF) are yet to be secured.

TfNSW advised that Hornby Council has agreed to register a Biobank site over 2 council reserves totalling 10.1 ha of BGHF (see attached Upper Pyles Creek and New Farm Road Biobank proposal). Once registered, this Biobank site will provide the majority of the credits for the NWRL project and Thornleigh Rail Project. Baulkham Hills Council is also seeking Council approval to register a Biobank site that will generate STIF and BGHF credits.

OEH noted that the Council Biobank site may be subject to 'credit discounting' if there were any existing obligations to manage the site for biodiversity conservation. The site is a stormwater reserve and it is expected that the main stormwater channel and existing walking tracks will be excluded from credit calculations. As there are no existing biodiversity management obligations the site will attract no or minimal credit discounting. This will be determined by OEH as the audit and assessment stage likely to be early 2014.

TfNSW has entered into agreements with council to purchase these credits once available.

Finally in addition to the above offsets, there is 0.5 ha of impact to non-certified ENV in the growth centres that will be offset in accordance with condition 8 of the Biocertification order via the purchase of credits at a ratio of 3:1 from a proposed new Western Sydney Parklands Biobank site that has already been assessed and submitted to OEH for registration.

Subject to any comments regarding the offset commitments from DP&I, TfNSW intends to develop and submit a Biodiversity Offset package for approval to the DG of DP&I. A draft of the package will also be sent to DP&I and OEH for comment by end of 2013/early 2014.

All offset obligations regarding the EPBC Act approval have already been met and endorsed by the Commonwealth Department of Environment.

Thank you

Robert Humphries

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Appendix 3: Biodiversity Credits owned by TfNSW (March 2013)

Search results for credit owner ID



Credit register ID - 116

matched 3 records

Credit owner(s): Transport for NSW

Ecosystem credits

Agreement ID	Credit ID	Vegetation Code	CMA subregion	Surrounding vegetation	Patch size	Vegetation formation	Credit Status	Available Credits
100	455	HN528	Cumberland - Hawkesbury/Nepean	11-30%	>100 ha	GRW	Issued	60
100	456	HN556	Cumberland - Hawkesbury/Nepean	11-30%	>100 ha	DGG	Issued	146
100	457	HN556	Burrangorang (Part A)	11-30%	>100 ha	DGG	Issued	104

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Appendix 4: Biodiversity Credits retired by TfNSW (March 2013)



Credit retirement report

Effective date: 09-April-2013
Transaction number: 201304-RT-27
Credit owners' details
Credit owner ID: 116
Name of credit holder: Transport for NSW
Other owner(s):
No other owners
Reason for retirement: Consent condition requirement

Ecosystem credit(s) retired								
Number of credits	Credit profile ID	Agreement ID	Vegetation code	Vegetation type	CMA subregion	% surrounding vegetation	Patch size	Vegetation formation(see key)
8	351	88	HN526	HN526/Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin	Cumberland - Hawkesbury/Nephean	31-70%	>100 ha	GRW
70	352	88	HN529	HN529/Grey Box - Forest Red Gum grassy woodland on shale of the southern Cumberland Plain, Sydney Basin	Cumberland - Hawkesbury/Nephean	31-70%	>100 ha	GRW
15	353	88	HN529	HN529/Grey Box - Forest Red Gum grassy woodland on shale of the southern Cumberland Plain, Sydney Basin	Cumberland - Hawkesbury/Nephean	31-70%	>100 ha	GRW
411	354	88	HN529	HN529/Grey Box - Forest Red Gum grassy woodland on shale of the southern Cumberland Plain, Sydney Basin	Cumberland - Hawkesbury/Nephean	31-70%	>100 ha	GRW

Key to vegetation formations

Code	Vegetation formation
ALP	Alpine complex
ASA	Arid shrublands (Acacia)
ASC	Arid shrublands (Chenopod)
DSG	Dry sclerophyll forests (shrub/grass)
DSS	Dry sclerophyll forests (shrubby)
FRW	Forested wetlands
FWW	Freshwater wetlands
GLD	Grasslands
GRW	Grassy woodlands
HLD	Heathlands
MES	Miscellaneous ecosystems
RFT	Rainforests
SAW	Saline wetlands
SWG	Semi-arid woodlands (grassy)
SWS	Semi-arid woodlands (shrubby)
WSG	Wet sclerophyll forests (grassy)
WSS	Wet sclerophyll forests (shrubby)

The credit register provides further information about credit holdings and reports about credit trading activity. To view this information, please visit the public register website at www.environment.nsw.gov.au/bimspri/index.htm

For more information, please contact the BioBanking Scheme Manager - phone (02) 9995 6753; email biobanking@environment.nsw.gov.au

Appendix 5: Biodiversity Credits retired by TfNSW (March 2016)



Application to retire biodiversity credits

This form is used to apply for the retirement of biodiversity credits under the Threatened Species Conservation Act 1995. If you need help completing this form, contact the BioBanking Team on 131 555 or at biobanking@environment.nsw.gov.au.

This is an interactive form – please click on boxes and type in responses (each field has unlimited characters). When completed, print the form and sign where appropriate. This form can also be printed and filled in by hand.

1 Credit owner's details

Credit register ID: 74 and 116

2 How to indicate which biodiversity credits are to be retired

Complete the following steps to specify the credits that are to be retired:

Step 1 Go to the BioBanking public register at <http://www.environment.nsw.gov.au/bimsprapp/BiobankingPR.aspx>

- Click on the 'Biodiversity credits register' link
- Select 'Search for credit holder'
- Enter credit owner's credit register ID in the box provided and click 'Search'
- Click on 'View credit retirement report as PDF' button
- Print the 'Credit(s) retirement report'.

Step 2 On the *Credit(s) retirement report* indicate the number of each ecosystem and/or species credit(s) to be retired from the owner(s) recorded in the credit register.

Step 3 Attach the completed *Credit(s) retirement report* to this application.

3 Purpose of credit retirement

<input type="checkbox"/> This application is to retire credits to satisfy the requirements of BioBanking statement ID:
<input type="checkbox"/> This application is to retire credits (specify below):
<input checked="" type="checkbox"/> to comply with a State significant development or State significant infrastructure project approval
<input type="checkbox"/> for conservation purposes
<input type="checkbox"/> other (please specify)

Note: Once credits have been retired, they are effectively removed from the market and cannot be transferred or further retired.


BioBanking
Biodiversity Banking and Offsets Scheme

6 Signature(s) of applicants

This application must be completed and signed by all the owners of the biodiversity credits that are being nominated for retirement, or by a person(s) with the legal authority to sign. The various options for signing the form according to owner category are set out in the table below.

Owner category	Application is signed and certified by
<input type="checkbox"/> Individual(s)	All the individuals who are owners of the biodiversity credits to be retired
<input type="checkbox"/> Company	<input type="checkbox"/> the common seal being affixed in accordance with the <i>Corporations Act 2001</i> , or <input type="checkbox"/> two directors, or <input type="checkbox"/> a director and a company secretary, or <input type="checkbox"/> the director, if a proprietary company that has a sole director who is also the sole company secretary.
<input type="checkbox"/> A local council	<input type="checkbox"/> the general manager in accordance with s.377 of the <i>Local Government Act 1993</i> (LG Act), or <input type="checkbox"/> the seal of the council being affixed in a manner authorised under the LG Act.
<input checked="" type="checkbox"/> A public authority other than a council	The chief executive officer of the public authority.

I hereby give consent for the retirement of the biodiversity credits listed in the credit retirement report attached to this application (all owners to sign).

Signature		Signature	
Name	Rodd Staples	Name	
Position	Sydney Metro Program Director	Position	
Date	4/11/16	Date	

Signature		Signature	
Name		Name	
Position		Position	
Date		Date	

Affix common seal (if signing under seal)

Note: The consent of all owners must be provided to complete the credit transaction. If you are signing on the owner's behalf you must state the nature of your legal authority and attach documentary evidence (e.g. power of attorney, executor, trustee, company director, etc).

7 Lodging the application

Once completed and signed, send the application with all attachments to the BioBanking Team.

Electronically – via Email biobanking@environment.nsw.gov.au

If the files are large then a data exchange site can be set up. Contact us via the mailbox to organise this.

Or by post:

The BioBanking Team
 Ecosystems and Threatened Species Unit
 Environmental Programs Branch (Level 12)
 Office of Environment and Heritage, NSW
 PO Box A290
 Sydney South NSW 1232

Note: You will be notified when the credits have been retired and the public register will be updated to reflect the change in status of the credits specified in this application.

Office use only

Received date	Completed date	Confirmation issued	Invoice number
/ /	/ /	/ /	/ /

Published by:
 Office of Environment and Heritage, NSW
 59–61 Goulburn Street, Sydney
 PO Box A290, Sydney South 1232
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 Phone: 131 555 (environment information and publications requests)
 TTY: (02) 9211 4723
 Fax: (02) 9995 5999
 Email: info@environment.nsw.gov.au
 Website: www.environment.nsw.gov.au

OEH 2015/0456
 July 2015

Credit(s) retirement report



Credit owner ID - 116

matched 5 records

Credit owner(s): Transport for NSW

Ecosystem credits

Agreement ID	Credit ID	Vegetation Code	CMA subregion	Surrounding vegetation	Patch size	Vegetation formation	Credit Status	Available Credits	Number to retire
100	455	HN528	Cumberland - Hawkesbury/Nepean	11-30%	>100 ha	GRW	Issued	60	54
100	456	HN556	Cumberland - Hawkesbury/Nepean	11-30%	>100 ha	DSG	Issued	146	73
100	457	HN556	Burraborang (Part A)	11-30%	>100 ha	DSG	Issued	104	
119	1,973	ME017	Cumberland - Sydney Metro	11-30%	>100 ha	GRW	Issued	15	
119	1,979	ME019	Cumberland - Sydney Metro	11-30%	<5 ha	GRW	Issued	5	

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Credit(s) retirement report



Credit owner ID - 74

matched 5 records

Credit owner(s): Transport for NSW

Ecosystem credits

Agreement ID	Credit ID	Vegetation Code	CMA subregion	Surrounding vegetation	Patch size	Vegetation formation	Credit Status	Available Credits	Number to retire
3	153	HN529	Cumberland - Hawkesbury/Nepean	31-70%	>100 ha	GRW	Issued	10	
142	1,802	HN596	Cumberland - Hawkesbury/Nepean	11-30%	>100 ha	WSS	Issued	81	33
70	251	ME019	Cumberland - Sydney Metro	11-30%	>100 ha	GRW	Issued	33	20
148	1,811	ME041	Cumberland - Sydney Metro	11-30%	>25-100 ha	DSG	Issued	90	
148	1,812	ME041	Cumberland - Sydney Metro	11-30%	>25-100 ha	DSG	Issued	50	10

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Appendix 6: Cheltenham Oval Community Facility Biodiversity Offset

North West Rail Link, now known as Sydney Metro, received approval on 25 September 2012 (SSI-5100). As required under condition C5 of the approval a Biodiversity Offset Package was prepared. All required Biodiversity credits were acquired and retired (Appendix 4).

Subsequent to the above, and as part of the Sydney Metro works, an area was identified for a Community Facility adjacent to Cheltenham Oval. This site has been surveyed and a report prepared (Eco Logical Australia 2017). Additional clearing of a small area (0.024 ha) of native vegetation, and impacts on a threatened plant species: *Epacris purpurascens* var. *purpurascens* have been identified. This Appendix provides an update to the Biodiversity Offset Package on the offsets relevant to these works.

It is proposed that the additional ecological offsets associated with the Cheltenham Community Facility works will be addressed via payment to the Biodiversity Conservation Trust. Given that the Biodiversity Conservation Trust is understood to be dealing with biodiversity credits under the Biodiversity Assessment Method (BAM), the number of credits under this methodology has been assessed.

A report is attached which sets out the survey and impact assessment performed (Eco Logical Australia 2017). It is noted that this is not a Biodiversity Development Assessment Report (BDAR), as this was not required as it is under the North West Rail Link project approval.

This report identified 0.024 ha of poor condition Sydney Turpentine Ironbark Forest Endangered Ecological Community vegetation as being impacted in a long strip along a batter slope. This area is too small for a BAM plot, which at 50m by 20m is 0.1 ha in size and greater in area than the amount of vegetation impacted. Furthermore, because the area is small, the credit liability under a BAM assessment will be rounded up to 1 credit irrespective of the field data. For this reason a credit calculation was performed by entering hypothetical data that produces a vegetation integrity score of 100, even though this would be far higher than the actual condition of the site.

Credit calculation was performed using the BAM credit calculator, with the following settings:

- IBRA = Sydney Basin
- IBRA Subregion = Pittwater
- NSW (Mitchell) Landscape = Port Jackson Basin
- % Native Vegetation Cover = 50%
- PCT selected = 1281
- Patch size = 501 ha (it is noted that this was not formally assessed and thus is a conservative number)
- Plot data –
 - Composition condition - all cover scores set to 100 (all highly conservative)
 - Structure condition - all scores set to 100 (all highly conservative)
 - Function condition – Regeneration stems <5cm BDH ticked, and all stem classes ticked, Number of large trees (>80cmDBHOB) and Hollow bearing trees set to 10, Litter cover

and coarse woody debris set to 100, High Threat Weed Cover set to 0 (all highly conservative

- All future scores set to zero
- *Epacris purpurascens var. purpurascens* – number impacted set at 37 (which assumes that the one remaining plant will not be viable).

The calculation of credits required for *Epacris purpurascens var. purpurascens* is based on survey and count of the number of plants present, which identified that 36 of the 37 plants located would be lost. Because it is not clear whether the one plant remaining would be viable, the credit calculation used a loss of 37 plants.

The credits required are:

- 1 credit of PCT 1281 / HN604 Turpentine - Grey Ironbark open forest on shale in the lower Blue Mountains, Sydney Basin Bioregion
- 56 credits of *Epacris purpurascens var purpurascens*

To offset the above, as the number of credits required are small, it is proposed to make payment to the Biodiversity Conservation Trust. An application has been submitted to the Biodiversity Conservation Trust, and they have indicated that they will accept payment, once “an amended biodiversity offsets package (approved by DPE), setting out the requirement to retire the relevant credits” is provided to them (email from Holly Park, Manager Biodiversity Offsets Program, 21/5/2018).

The offsets required under the BAM are compared in the text below with the offset requirements of the original EA for comparison. As identified in section 1.1 of this report, the EA report included a Biodiversity Offset Strategy (Section 5.4 and Appendix N) which proposed offset ratios ranging from 3:1 to 5:1 depending on the condition of the vegetation being impacted. The vegetation impacted has been identified as being in “Poor” ecological condition, and thus an offset ratio of 3:1 would have applied with regards to vegetation impacts under the original EA report. Applying this offset ratio would mean that an offset of 0.072 ha would have been required. OEH have not yet released an average number of credits generated per hectare from Biodiversity Stewardship sites under the BAM, but to date from assessments performed by Eco Logical Australia staff, sites have been found to generate in the range of <1 to 3 credits per ha. Using this range would mean that approximately 0.33 to 1 hectare of vegetation would need to be managed as a Biodiversity Stewardship site to provide the 1 credit required for the Cheltenham Community Facility. It is noted that even the low range (0.33 ha managed) is substantially in excess of the offset of 0.072 ha required under the original EA.

The original EA report did not identify any impacts to *Epacris purpurascens var purpurascens*, and thus did not propose offsets, but it did note that impacts would be confirmed via pre-clearance survey, and that mitigation measures would occur. It is noted that salvage of the impacted *Epacris purpurascens var purpurascens* is proposed as a mitigation measure, and it is understood that TfNSW is progressing this. Nonetheless, offset of the impact consistent with the BAM methodology is proposed.

A copy of the credit calculations and payment summary reports are included on the following pages of this Appendix.



BAM Credit Summary Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00010771/BAAS17062/18/00010773	Cheltenham Oval	24/02/2018
Assessor Name	Report Created	BAM Data version *
Steven Ward	10/05/2018	3
Assessor Number	* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.	
BAAS17062		

Ecosystem credits for plant communities types (PCT), ecological communities & threatened species habitat

Zone	Vegetation zone name	Vegetation integrity loss / gain	Area (ha)	Constant	Species sensitivity to gain class (for BRW)	Biodiversity risk weighting	Candidate SAI	Ecosystem credits
Turpentine - Grey Ironbark open forest on shale in the lower Blue Mountains, Sydney Basin Bioregion								
1	1281_Poor	100.0	0.0	0.25	High Sensitivity to Potential Gain	2.00	TRUE	1
							Subtotal	1
							Total	1



BAM Credit Summary Report

Species credits for threatened species

Vegetation zone name	Habitat condition (HC)	Area (ha) / individual (HL)	Constant	Biodiversity risk weighting	Candidate SAI	Species credits
<i>Epacris purpurascens var. purpurascens / Epacris purpurascens var. purpurascens (Flora)</i>						
1281_Poor	N/A	37	0.25	1.5	False	56
					Subtotal	56



Biodiversity payment summary report

Assessment Id	Payment data version	Revision number	Report created
00010771/BAAS17062/18/00010773	27	0	10/05/2018

PCT list

Include	PCT common name	Credits
Yes	1281 - Turpentine - Grey Ironbark open forest on shale in the lower Blue Mountains, Sydney Basin Bioregion	1

Species list

Include	Species	Credits
Yes	<i>Epacris purpurascens var. purpurascens</i> (Epacris purpurascens var. purpurascens)	58

Ecosystem credits for plant communities types (PCT), ecological communities & threatened species habitat

IBRA sub region	PCT common name	Baseline price	Dynamic coefficient	Market coefficient	Risk premium	Administrative cost	Methodology adjustment factor	Price per credit	No. of ecosystem credits	Final credits price
Pittwater	1281 - Turpentine - Grey Ironbark open forest on shale in the lower Blue Mountains, Sydney Basin Bioregion Warning: This PCT has NO trades recorded in Pittwater	\$17,500.00	0.74244210	1.23744800	20.87%	\$20.00	1.0000	\$5,907.70	1	\$5,907.70
Subtotal (excl. GST)										\$5,907.70



Biodiversity payment summary report

GST **\$590.77**

Total ecosystem credits (incl. GST) \$6,498.47

Species credits for threatened species

Species profile ID	Species	Threat status	Price per credit	Risk premium	Administrative cost	No. of species credits	Final credits price
10273	<i>Epacris purpurascens var. purpurascens</i> (Epacris purpurascens var. purpurascens)	Vulnerable	\$143.68	20.8700%	\$20.00	56	\$10,845.30

Subtotal (excl. GST) **\$10,845.30**

GST **\$1,084.53**

Total species credits (incl. GST) \$11,929.83

Grand total \$18,428.30



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