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Transgrid HumeLink Project

Biodiversity Offset Delivery Strategy

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Glossary and list of abbreviations

Term or abbreviation	Definition
BAM	Biodiversity Assessment Methodology
BC Act	NSW <i>Biodiversity Conservation Act 2016</i>
BC Regulations	<i>Biodiversity conservation Regulation 2017</i>
BCT	Biodiversity Conservation Trust
BDAR	Biodiversity Development Assessment Report
BOPC	The Biodiversity Offsets Payment Calculator
BODS	Biodiversity Offset Delivery Strategy
BOS	NSW Biodiversity Offset Scheme
BSS	Biodiversity Stewardship Site
Credits	Generic term for biodiversity offset credits which could comprise either species credits or ecosystem credits
CST	Credits Supply Taskforce
DPE	NSW Department of Planning and Environment
Ecosystem credits	Ecosystem credit are units of value (credits) determined through the application of the BAM which measure the value of threatened ecological communities, threatened species habitat for species that can be reliably predicted to occur with a Plant Community Type (PCT), and PCTs generally. Ecosystem Credits are best thought of as credits derived from vegetation communities and their constituent fauna assemblages.
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
EP&A Act	NSW <i>Environmental Planning and Assessment Act 1979</i>
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
MNES	Matters of National Environmental Significance under the EPBC Act
PCT	Plant Community Type
Species Credits	Species credit are units of value (credits) determined through the application of the BAM which apply to all other threatened species which are found to occur at that location and cannot be reliably predicted to occur within the identified ecological communities at the development site. Species credits are best thought of as applying to <u>some</u> threatened species (flora and fauna), apart from the vegetation communities they may inhabit.
SSI	State Significant Infrastructure
TEC	Threatened Ecological Community
TFD	Total Fund Deposit (applies to a BSS)

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1. Introduction

1.1 HumeLink

Transgrid proposes the construction and operation of around 360 kilometres of high-voltage transmission lines and associated infrastructure between Wagga Wagga, Bannaby and Maragle (the project). This project is collectively referred to as HumeLink (Figure 1).

Transgrid is seeking approval for the project under Part 5 Division 5.2 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). The project has been declared Critical State Significant Infrastructure (CSSI) under State Environmental Planning Policy (Planning Systems) 2021. The project was also declared a controlled action by the Department of Climate Change, Energy, the Environment and Water (DCCEEW) and requires a separate approval under the (Commonwealth) *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act). The project is subject to the bilateral assessment process that has been established between the Commonwealth and NSW governments.

The NSW Biodiversity Offsets Scheme (BOS) applies to State Significant Infrastructure (SSI) and a Biodiversity Development Assessment Report (BDAR) for the project is required under the BOS. The BDAR has been completed by Niche Environment and Heritage (Niche) and is currently on exhibition as part of the Environmental Impact Statement (EIS) approval process. This document should be read in association with the BDAR for the project. Annex 1 provides an overview of the NSW BOS and its application to the HumeLink project.

The BDAR assesses the impacts of the project on biodiversity and also quantifies the requirements for biodiversity offsets under the BOS (see Section 15 of the BDAR and summary in Annex 2 of this report) in terms of Ecosystem Credits and Species Credits (hereafter referred to collectively as credits unless describing a specific credit type) in accordance with the Biodiversity Assessment Method (BAM). Section 16 of the BDAR outlines the Biodiversity Offset Strategy for the project including consideration of the offset requirements under the EPBC Act which is to formally recognise the NSW BOS as the mechanism to offset impacts of the project on Matters of National Environmental Significance (MNES).

The BDAR notes that Transgrid is investigating the following options to formally satisfy the offset obligation under State and Commonwealth legislation:

- Establishment of a Biodiversity Stewardship Site(s) with the required biodiversity values which would allow for creation and then retirement of associated credits.
- Retirement of credits from existing Transgrid BioBanking/Biodiversity Stewardship Sites.
- Retirement of credits purchased from the credit market.
- Payment into the Biodiversity Conservation Fund (BCF) which would transfer the biodiversity offset obligation to the Biodiversity Conservation Trust (BCT).

Transgrid, correctly reserves the right in the BDAR to discharge their offset obligation through any of the above options upon project approval (i.e. any of the above mechanisms, or combination of mechanisms remain viable options at this time).

1.2 Biodiversity Offset Delivery Strategy

This Biodiversity Offset Delivery Strategy (BODS) seeks to advance the Biodiversity Offset Strategy outlined in the BDAR for the project by reporting on consultation with key Transgrid personnel relating to

Transgrid's preferred mechanisms to discharge the project's biodiversity offset obligation. The BODS is not a formal requirement of the NSW environmental planning process, as compared with the BDAR, but is intended to form a significant internal Transgrid strategy document for the delivery of the offset program for the project.

This BODS has been developed with the HumeLink team and with input from a range of leaders and specialists within Transgrid through a series of consultation meetings and workshops since October 2022. This document is not static, rather it will evolve to reflect changes to the project BDAR in response to design considerations, project conditions of consent, additional surveys completed in the development area and investigations of offset lands and the trading market as well as other factors.

1.3 This report

The structure of this report is as follows:

Section 1: Introduction

Section 2: HumeLink biodiversity offset obligation and financial cost estimate

Section 3: HumeLink Biodiversity Offset Delivery Strategy – Assumptions

Section 4: Biodiversity offset timeframes for HumeLink

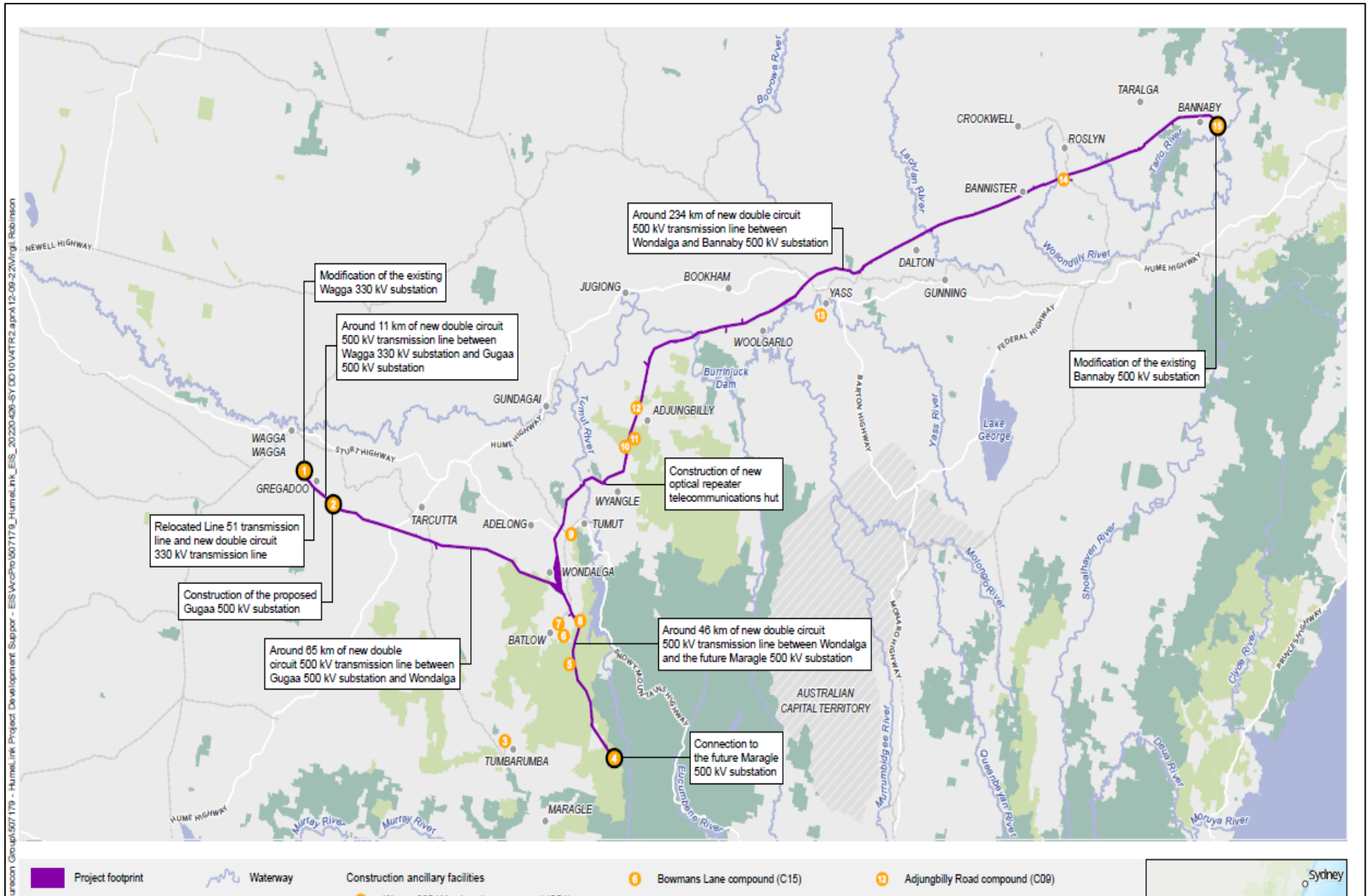
Section 5: HumeLink Biodiversity Offset Delivery Strategy – Roadmap

Annex 1: NSW Biodiversity Offsetting Scheme

Annex 2: Biodiversity Offset Execution Pathways – Qualitative Assessment

Annex 3: HumeLink Biodiversity Offset Obligation.

Figure 1: HumeLink project footprint and key project components (source – Transgrid)



2. HumeLink – biodiversity offset obligation and financial cost estimate

2.1 Biodiversity offset obligation

HumeLink's biodiversity offset obligation has been assessed in the project BDAR and will be confirmed and written into the project approval conditions at the time of the project's determination.

Importantly, although the BDAR includes the formal assessment of the project's offset obligation, it relies on a range of assumptions which may be subject to a level of review following feedback from relevant regulatory authorities during the submissions process for the EIS. The BDAR has been required to assume the presence of some species credit species within the project development footprint, on a precautionary basis, despite a limited chance of their occurrence. The assumption of presence has resulted in the generation of a species credit obligation for the project which is unlikely to represent a true scenario and may be refined subject to survey of areas previously inaccessible to the project team.

Changes to the final development footprint, additional surveys to confirm the presence or absence of some species credit species and final agreement on the assumptions employed to calculate the offset obligation could all lead to variations in the final number of ecosystem and species credits required to discharge the project's offset obligation.

Annex 3 outlines the biodiversity offset obligation as per the BDAR for the project as it stood in August 2023. Section 2.2 outlines the financial cost estimate to discharge the project's offset obligation, however this cost is highly subject to credit costs (driven by availability and other market forces) and employment of an optimal offset strategy. The financial cost estimate is also yet to be formalised through the receipt of a formal quote to discharge the offset obligation through the BCF.

2.2 Financial cost estimate of biodiversity offsets

The Project Assessment Conclusions Report for HumeLink¹ identified the potential financial costs of offsetting various technical options for the project ranging between approximately \$800 million and \$1.3 billion. These assessments included conservative assumptions and were based on the relative cost of paying for all offsets through the BCF at the time of that report's preparation, which is the most expensive offset pathway.

Through development of the BDAR and this BODS, Niche has revised that original set of estimates down. The revised cost estimate is based on a number of significant assumptions that are yet to be confirmed with the NSW regulators, but it does include updated information on the market value of some ecosystem credit types that are large contributors to the offset obligation (for example the White Box Yellow Box Blakely's Red Gum Woodland – Offset Trading Group (OTG) which accounts for approximately 46% of the project's ecosystem credit offset obligation). Credits from PCTs within the White Box Yellow Box Blakely's Red Gum Woodland – OTG are currently trading at about half the value they were 12 months ago as a result of high levels of supply coming onto the market.

Notwithstanding the reduced price estimate for ecosystems credits, one significant matter remains. In October 2022, the Credits Supply Taskforce (CST) removed the previously publicly available credit pricing tool (Biodiversity Offsets Payment – Calculator, or BOP-C) from public view and replaced it with the Biodiversity Conservation Fund Charge System. At the same time, the CST adjusted the values of most

¹ <https://www.transgrid.com.au/media/rxancvmx/transgrid-humelink-pacr.pdf>

species credits up (in some cases significantly so²). This resulted in very significant increases to overall offset liability costs estimates for those projects that had previously assumed payment into the BCF as a viable economic alternative to sourcing the credits on the market (which were almost non-existent) or developing the credits on offset sites they were establishing themselves.

2.2.1 BCF charge system Quote (pending EIS submission)

As noted elsewhere, a proponent may discharge their project's biodiversity offset obligation through payment into the BCF.

A proponent may seek a formal **Charge Quote** from the BCT which can only be supplied once a development application with an offset obligation has been submitted to a consent authority (including an application for biodiversity certification, approval under Part 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) or Part 5A of the *Local Land Services Act 2013* (LLS Act)). A Payment to the BCF can only be made once development consent (or biodiversity certification or approval) has been granted. The formal charge quote provides a 'moment in time' per-credit price to pay into the BCF but allows for a monthly per-credit price increase for up to 36 months - i.e. the quote is valid for three years but monthly indexation applies.

The HumeLink project has sought a formal Charge Quote (September 2023) from the BCT for the entirety of the project's offset obligation as per its submitted BDAR. The quote will serve as the upper limit of offset cost to Transgrid in discharging the obligation and will likely form the basis of any bond payable to extend the offset obligation date for the project.

It should be noted that the quote from the Biodiversity Conservation Fund Charge System can be formally updated once per financial year but careful consideration should be given to updating the quote as credit prices may increase from time to time.

2.2.2 Cost estimate based on BCF charge system Price Estimate (May 2023) and submitted BDAR (August 2023)

A price estimate for biodiversity credits using the BCF charge system was obtained from the BCT by Niche on 16 May 2023. The price estimate provides the per credit base price for each entity requiring offset credits; it does not include some elements of costs that would be applied if the offset obligation is discharged through the BCF. Additional costs will include a risk premium and an administration fee. These fees have been calculated by Niche and added to the estimate. A summary of the price estimate (and the key assumptions relating to the price estimate) is supplied in Table 1.

At Transgrid's request, Niche has provided an upper limit estimate for payment into the fund taking into account potential increases in credit numbers and pricing (contingencies) that may occur due to design changes or stakeholder consultation between now and approval of the project. The upper limit estimate also makes provision for a known route change around the Green Hills area which would reduce the offset liability. Assumptions relevant to the estimate are provided in Section 2.2.3 below.

The final, accurate cost for discharging the biodiversity offset obligation through the BCF can only be determined when the formal quote for the BCF is obtained.

² Niche has quotes for various projects to discharge their offset obligation through the BCF. Significant increases were seen for some taxa including Owls which increased from \$253.23/c (ex GST) to \$4,739.07.c (ex GST); a 1,871% increase cost per owl species credit to pay into the BCF.

The current upper limit estimate of offset liability under Scenario 1 without any allowances for contingencies and based on payment into the fund is approximately \$509M. A monthly indexation³ will be applied to the base prices informing this estimate. Addition of a risk contingency (16%) to cover a worst-case scenario would increase the offset cost to **\$583M**. Key assumptions underpinning this contingency are explained in detail below.

2.2.3 Key assumptions for contingency

- Does not account for the removal of any price caps on credits that were >\$5,000/credit within the BOPC prior to its removal (these credits have been capped at a 20% increase until October 2023). This has been factored into the contingency cost as a **3% increase** (for ecosystem credits and species credits) (based on an assumed 50% increase for the 6% of credits affected by the cap). The 50% increase is based on average observed increases in credit costs for PCTs that were not limited by the cap.
- Assumes BCT estimate price does not increase once a quote is available upon submission of EIS. This has been factored into the contingency cost as a **3% increase** (for ecosystem credits and species credits). The increase allows for some credits to fluctuate in price based on updated data used by the BCT in their credit pricing models. A select number of species may experience changes in their categorisation or weighting values which are variables that feed into the pricing model used by the BCT. The percentage increase reflects our knowledge of the proportion of species likely to be impacted by change of categorisation and weighting within a relatively short time period of 6 months.
- Assumes the BCD accepts current approach to determination of credits for a range of species particularly count species. This has been factored into the contingency cost as a **10% increase** (for species credits). The 10% increase is based on 6% of the current offset requirement being attributable to count plant species for which credit calculation methods are identified as particularly subjective. In addition, there may be some requirement to provide additional credits (ecosystem and species credits) based on indirect impacts from the project. These impacts are difficult to quantify, however based on previous experience and the nature of the project a 4% increase could be expected.

³ The monthly indexation published by the BCT is currently 0.5% which is applied to the base credit price. This is not explicitly factored into contingencies as it represents inflationary costs. This advice is intended to be relevant to this point in time.

Table 1: HumeLink offset liability cost if paying into the NSW Biodiversity Conservation Fund

Staged cost estimate for payment into BCF	Cost (\$)
Species credit - BDAR submitted August 2023 (base price)	\$315,245,374
Ecosystem credit - BDAR submitted August 2023 (base price)	\$54,898,349
Species credit - Green Hills route reduction	\$297,745,374
Ecosystem credit - Green Hills route reduction	\$50,898,349
Species credit - additional clearing (add 20%)	\$357,294,449
Ecosystem credit - additional clearing (add 20%)	\$61,078,019
Species credit - contingency addition (add 16%)	\$414,461,560
Ecosystem credit - contingency addition (add 6%)	\$64,742,700
Addition of risk premium (11.1%) current standard	\$53,191,673
Addition of delivery fee (10.5%) average of quotes to date	\$50,316,447
Total Scenario 1 BCF charge fee	\$582,712,381

2.2.4 Cost reduction strategies

A number of potential cost reduction assumptions are noted above and further cost reduction strategies are described in Section 3.

One of the key opportunities to reduce the overall cost burden of the biodiversity offset obligation is through self-generation of the biodiversity offset values or through market interactions for highly tradeable biodiversity offset values. The example of the White Box Yellow Box Blakeley's Red Gum Woodland Offset Trading Group may be instructive.

The current BCF Charge System estimate to discharge the offset obligation for this OTG (an estimated total of 4,908 credits) is approximately \$26,856,576 (assuming a per credit price of \$5,400 plus risk weighting and administration fees).

Niche's recent analysis of this OTG indicated the presence of approximately 17,000 credits of this OTG available on the market or pending issue at existing offset sites or offsets sites pending registration within the available source catchment for HumeLink for this credit type. Note this volume of credits is subject to change and in late July 2023, Niche undertook a market sounding for this credit type which revealed that a considerable volume of the credits identified as available or pending creation were secured by developers waiting to discharge their offset obligation. The available market is therefore something different to the observable market.

Notwithstanding this, the long term weighted average for credit sales from this OTG (since 27/11/2019) for a total of 5,903 credits traded is \$4,358 per credit (see Figure 2). On this value alone the BCF Charge System estimate can be improved by \$1,042 per credit (almost 20% improvement). That is, if the HumeLink offset liability for this OTG was discharged through on-market purchases at the long term weighted average price for rather than paying into the BCF, a cost saving of \$5.1 million for this OTG alone could be achieved.

Niche is however confident that this cost saving could be further increased through informed negotiations with willing suppliers of this credit type (i.e. further reducing the credit pricing through volume sales) and/or through self-generation of this credit type at a Transgrid owned BSA site or through a sponsored BSA arrangement on a third party property.

This logic and approach is recommended for adoption across the entire offset program for the HumeLink project as discussed in Section 3.

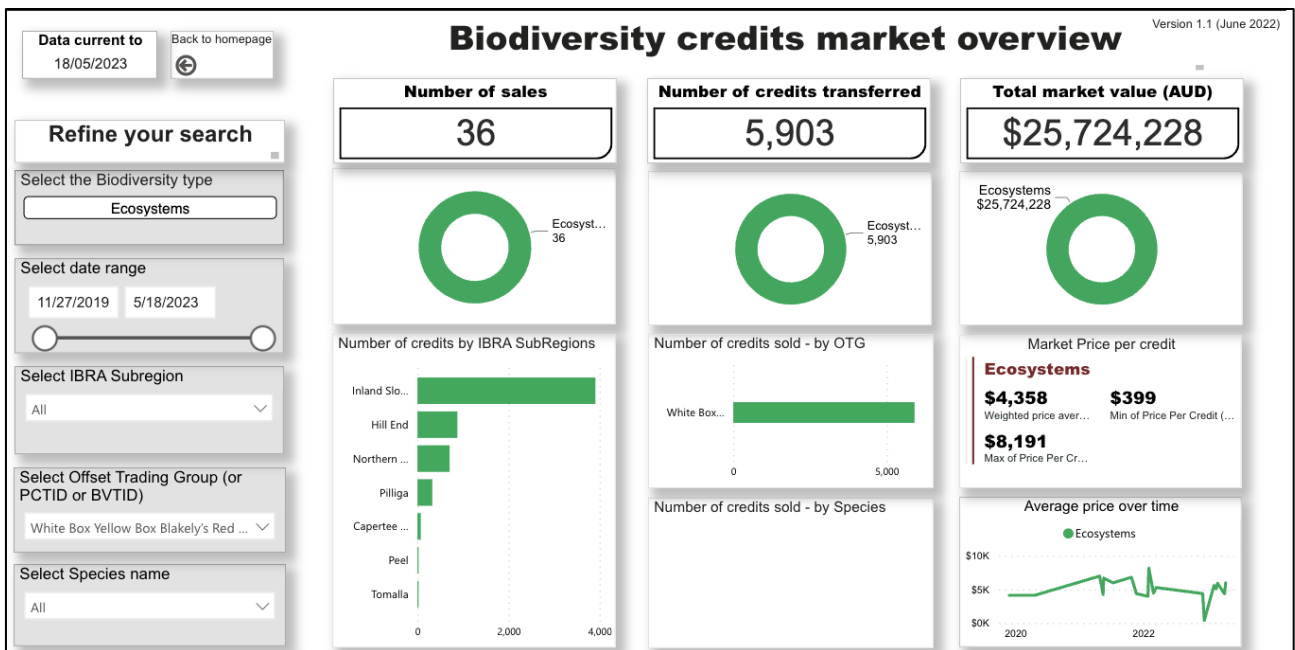


Figure 2: Credit pricing and sales history for the White Box Yellow Box Blakeley’s Red Gum Woodland Offset Trading Group⁴

⁴ source:

<https://app.powerbi.com/view?r=eyJrIjoiZWl3MmZhMTctZGVjNi00ZTdILTkwZTEtOGY4NWNhYjc3M2RiliwidCI6lj2ZWY4ODIxLTJhMzktNDcxYy1iODIhLTU3YjA4MzNkZDNIOSJ9>

3. HumeLink Biodiversity Offset Delivery Strategy – assumptions

The BODS presented here and the associated estimates of credit liabilities and acquittal costs has been developed on the basis of a number of key assumptions including a project offset retirement deadline of mid-2026 (assuming an environmental bond can be negotiated for the project).

Consultation with Transgrid personnel during the BODS development has indicated that there are a number of matters that Transgrid as an organisation are yet to resolve in relation to its approach to biodiversity offsetting. Those matters include firm positions on land acquisition and divestment, integration of sustainability targets with biodiversity offsetting programs and indeed a program wide approach to offset credit generation.

It would be of benefit to the HumeLink BODS execution team to have all outstanding matters resolved prior to commencing the next phase of the program however that is not feasible or reasonable given the project timeframes. The roadmap to deliver the HumeLink offset obligation has been developed with the following key assumptions, all of which will lead to an approach that is likely to prove to be no-regret initiatives regardless of the outcomes of the decisions on outstanding matters.

3.1 Reduce HumeLink's biodiversity offset obligation

A significant component of the offset obligation defined in the BDAR has arisen from the requirements of the BAM to assume the presence for species credit species and the presence of high quality vegetation (resulting in high credit yields) from portions of the development footprint for which survey access was not granted.

To date, there has been access to around 75% of the project development footprint for the purposes of ecological assessment. However, targeted survey for threatened fauna or restricted season species has been limited within these areas to date.

Niche has commenced analysis of the accessible and previously inaccessible properties in order to identify those properties which, if survey access was to be granted, could be investigated to reduce the offset obligation and therefore costs of the offsetting program. It is anticipated that the offset obligation currently identified in the BDAR will be updated prior to the submission of an Amendment Report in the Response to Submissions stage of the of the project approval process.

Early results have indicated that the offset quantum represented by assumed presence requirements contributes a significant amount to both the offset quantum and estimated offset costs as noted below.

Additional surveys on the previously inaccessible properties will not remove the offset liability for planned development activities on those properties in most cases. Rather, the surveys should result in an accurate quantification of the biodiversity on those properties (i.e. not an assumed presence) and a reduction of the projects overall offset liability when and if the surveys can prove the absence of some values that would otherwise generate an offset liability.

Niche estimates that targeted surveys on sites previously inaccessible to the impact assessment survey team could lead to a reduction in offset liability in the order of 15% to 25% of the currently calculated offset obligation (subject to demonstrated absence of particular habitat values and/or species).

3.2 Project approval conditions

The following project approval conditions have been assumed in the development of the HumeLink BODS. Advocacy at this stage to the NSW DPE to seek suitable consent conditions is recommended.

3.2.1 Extended delivery deadline

Transgrid has identified its intention to seek a PEC-style extension to the biodiversity offset retirement date for HumeLink through an environmental bond arrangement.

The bond arrangement will add two years (post-date of approval) to the timeframe for the offset retirement date for HumeLink. This is entirely material to the delivery of the project's offset obligation given the timeframes for the various offset execution pathways outlined in Annex 2.

It is recommended that Transgrid seek formal agreement with the NSW DPE that this mechanism will be available to HumeLink and that the following conditions be included in the Deed between Transgrid and the NSW DPE in respect to the bond:

- The value of the bond to be calculated on the un-retired credit obligation for the project at the bond commencement date (assuming some credits will be retired by that time).
- A three-monthly review of the credit obligation throughout the life of the bond facility with the intention of returning the BCF equivalent dollar value to Transgrid for any biodiversity credits retired in the previous quarter.

Note: the HumeLink BODS schedule has been designed to ensure significant offset credit volumes can be obtained and retired prior to the bond payment date. For example, we know that the White Box Yellow Box Blakely's Red Gum Woodland OTG is both broadly represented in the existing and pending offset market and can otherwise be easily sourced through an Expression of Interest (EOI) or direct market purchase. Given it represents approximately 42.3% of HumeLink's total ecosystem credit liability, which if secured by paying into the BCF would cost in the order of \$5,400 per credit (or 4,908 credits @ a total value of approximately \$27million, or realistically could probably be sourced from the existing or pending market for at least 20% less than that value), it would appear to be an avoidable inclusion in the environmental bond agreement. Further, this credit type is likely to be a credit type in high demand for many of Transgrid's other projects into the future and as such securing this credit type ahead of the project approval is a low risk option.

3.2.2 Project site definition

The Inland Rail NS2B⁵ and also N2N⁶ projects sought approval to consider the entire project footprint as the "impacted site" for the purposes of identifying the biodiversity offset source catchment for ecosystem credits. This position was supported by the then Biodiversity, Conservation and Science Directorate of the NSW DPE, and included as the defined 'impacted area' (being the full length of the alignment) in the approved Biodiversity Offset Package for the project⁷.

Defining the project site as the entire footprint for the project is material to the HumeLink BODS as it maximises the source catchment area for ecosystem credits, increasing the efficiency of the offset credit sourcing across the project. Consultation with the NSW DPE relating to this particular project approval condition commenced on 9 May, 2023 when the HumeLink project team presented a high level overview of

⁵ majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSI-9371%2120230213T000139.115%20GMT

⁶ majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSI-9487%2120230222T225058.969%20GMT

⁷ majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSI-9371%2120230213T000139.115%20GMT.

the project to NSW DPE. Ongoing consultation with the NSW DPE during the project EIS submission process will be necessary to ensure the inclusion of this condition in the draft and final project approval.

3.2.3 Application of the Ancillary rules: Reasonable steps to seek like-for like biodiversity credits

The BODS has assumed that Transgrid will, if deemed appropriate, seek to apply the variation rules to offset both ecosystem and species credit requirements.

Where evidence of compliance with the Ancillary rules: Reasonable steps to seek like-for-like biodiversity credits for the purpose of applying the variation rules has been provided to, and approved by the Planning Secretary, the variation rules may be applied to retire the relevant ecosystem credits and species credits as set out in the BAM Biodiversity Credit Report (Variation). The variation rule does not apply to biodiversity credits for threatened species or threatened ecological communities that are listed as critically endangered under the Biodiversity Conservation Act 2016 or listed in any capacity under the Environment Protection and Biodiversity Conservation Act 1999 (source)⁸.

Subject to approval from the NSW DPE, a proponent may seek to source species credits from the market for a specified, minimum time period (see Annex 1), and if they are not available they may apply to use the *Ancillary rules: Reasonable steps to seek like-for like biodiversity credits* to retire species credits which are available on the market. Whilst the rules for which species credits might be retired in lieu of other species credits require further consideration, it may be entirely possible to purchase koala credits on the market today at prices in the order of \$300-500 per credit and, through the application of the *Ancillary rules: Reasonable steps to seek like-for like biodiversity credits*, retire them to discharge the credit obligation for an alternative species credit type which is of far higher value in the BCF.

3.2.4 Engage on alternatives to retiring biodiversity credits

Annex 1 identifies the potential for proponents in NSW to access the *Ancillary Rules (biodiversity conservation actions)* as an alternative mechanism, restricted as it is, to support their program of offsets for any particular project.

There may be reasonable grounds for Transgrid to consider the ancillary rules though for some difficult to source or locally restricted biodiversity values (such as some of the more cryptic alpine species) as candidates for this offsetting mechanism.

It is recommended that the HumeLink BODS execution team undertake the following:

1. Review the list of locally restricted and cryptic species credit species to identify potential candidate species for this offsetting mechanism. Several orchid species, perhaps the alpine frogs⁹ and other alpine species would seem appropriate to consider.
2. Engage with the NSW DPE to gauge their appetite to consider enacting this offsetting mechanism.
3. Confirm the level of effort required to engage with the NSW DPE (Environment and Heritage).

⁸ Condition E27 - chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSI-9487%2120230222T225058.969%20GMT

⁹ Note: the NSW DPE (Environment and Heritage) have recently published articles relating to their efforts to increase the population of the Corroboree Frog in the Kosciuszko National Park. Support for this program or similar programs might be acceptable as biodiversity conservation actions (<https://www.environment.nsw.gov.au/news/there-s-no-place-like-home-second-cohort-of-southern-corroboree-frogs-return-to-kosciuszko>).

3.2.5 Offset avoidance incentives

Development of the Construction Environmental Management Plan, contractual incentives and improved development practices, and refinement in project design and construction methodology will likely lead to further impact avoidance, thus reducing the biodiversity offset liability identified in the BDAR.

It is recommended that Transgrid seek approval conditions that enable a post construction quantification of impact reduction and for that improvement to be reflected in the final reconciliation of the environmental bond value.

4. Biodiversity offset timeframes for HumeLink

Figure 3 presents the indicative timeframes for the HumeLink project as well as indicative timeframes for retirement of the biodiversity offset obligation under the various offset pathways (as at May 2023).

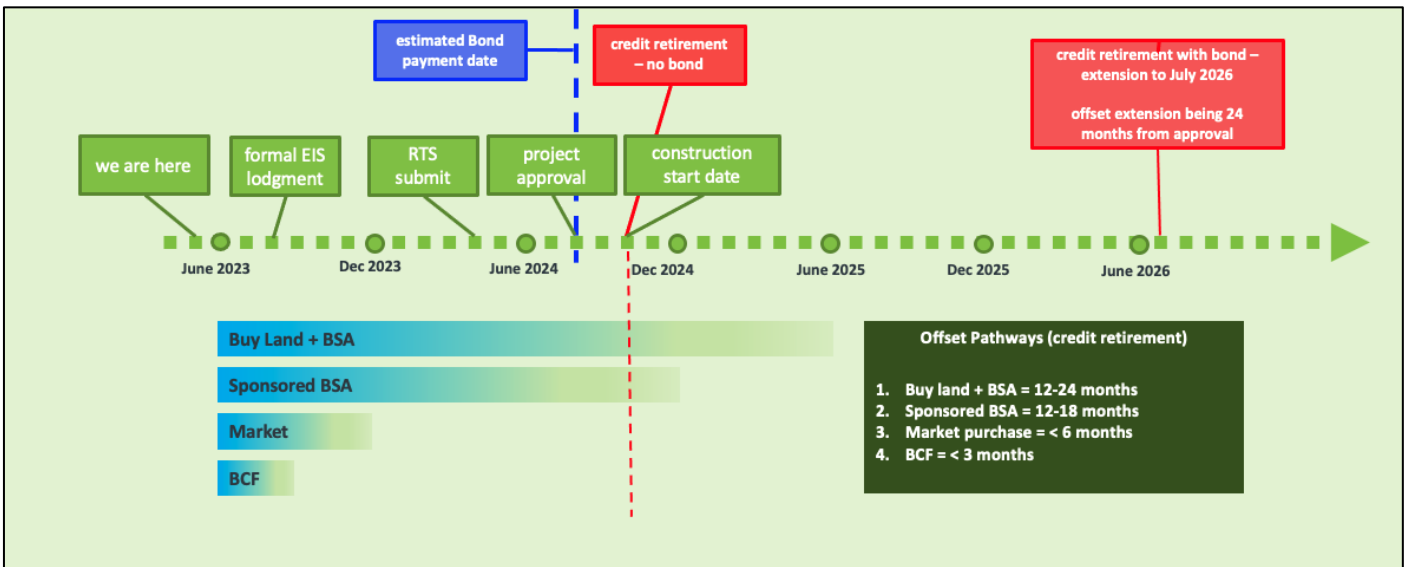


Figure 3: Indicative project timelines compared with time to discharge offset obligation through various offset pathways (May 2023)

Annex 2 provides a qualitative assessment of the offsetting pathways available to HumeLink and notes that, generally speaking buying land and establishing a BSA is the most cost effective method of credit generation. That approach is followed in increasing cost order by the proponent sponsored model of credit generation on the landholding of a third party, purchasing credits from the market and finally payment into the BCF.

Cost per credit is however inversely proportional to the timeframes required to generate credits or discharge a credit obligation through the various pathways. To that end, in order to reduce the overall cost of the offset obligation for HumeLink, the maximum amount of time to discharge that offset obligation should be sought.

Figure 3 indicates that should HumeLink gain approval to access a bond mechanism to extend the projects biodiversity offset obligation date by two years from approval (similar to Project Energy Connect) it would result in a final offset retirement date of around July 2026. Should that extension be achieved, all offsetting mechanisms are available to the project. If that extension is not forthcoming, it is likely that the two most expensive offsetting mechanisms would provide the pathway to secure the offset obligation for the project.

5. HumeLink Biodiversity Offset Delivery Strategy - Roadmap

Figure 4 shows conceptually the proposed schedule for the HumeLink BODS. The Schedule is staged in three phases which are outlined below.

5.1 Phase 1 – Pre-Planning approval

Phase 1 of the BODS will be focussed on three key tasks including:

1. Engagement with the NSW DPE to ensure that the approval conditions which form the basis of the BODS are accommodated within the project approval and in the negotiated bond agreement between the NSW DPE and Transgrid.
2. Re-defining the offset obligation for HumeLink through survey prior to submission of the Amendment Report in the Response to Submissions phase for the project EIS.
3. Commencement of offset site identification and the generation and or acquisition of biodiversity offset credits that would contribute significantly to the projects biodiversity offset requirements.

Other key tasks in this phase of the BODS include:

1. Undertaking an EOI process for the projects offset credit requirement. The EOI process might be multi-faceted with approaches to the existing biodiversity offsets market through the Biodiversity Offsets Scheme Public Register (credits in demand register) and also to landholders who may be able to supply credits through a sponsored BSA approach.
2. Securing (and updating as appropriate) a formal quote from the BCF.

Importantly, this phase will present the final opportunity to revise the impact calculations for inclusion in the EIS supporting documentation prior to the project approval being granted and it will be important to ensure that an entirely accurate (and reduced) offset obligation is presented in the EIS supporting documentation.

5.2 Phase 2 – Post-Planning Approval

Phase 2 of the BODS will focus on securing and retiring the maximum number of biodiversity credits achievable in the period following receipt of planning approval with a view to minimising the value of the environmental bond required for the HumeLink project which is expected to be payable (either a cash or bank guarantee mechanism) prior to commencement of construction. Key tasks will include:

1. Offset package development, negotiation and approval with the NSW DPE.
2. Generation and/or securing biodiversity offset credits and retiring them against the project offset obligation.
3. Consultation with the NSW DPE to finalise the value of the environmental bond.

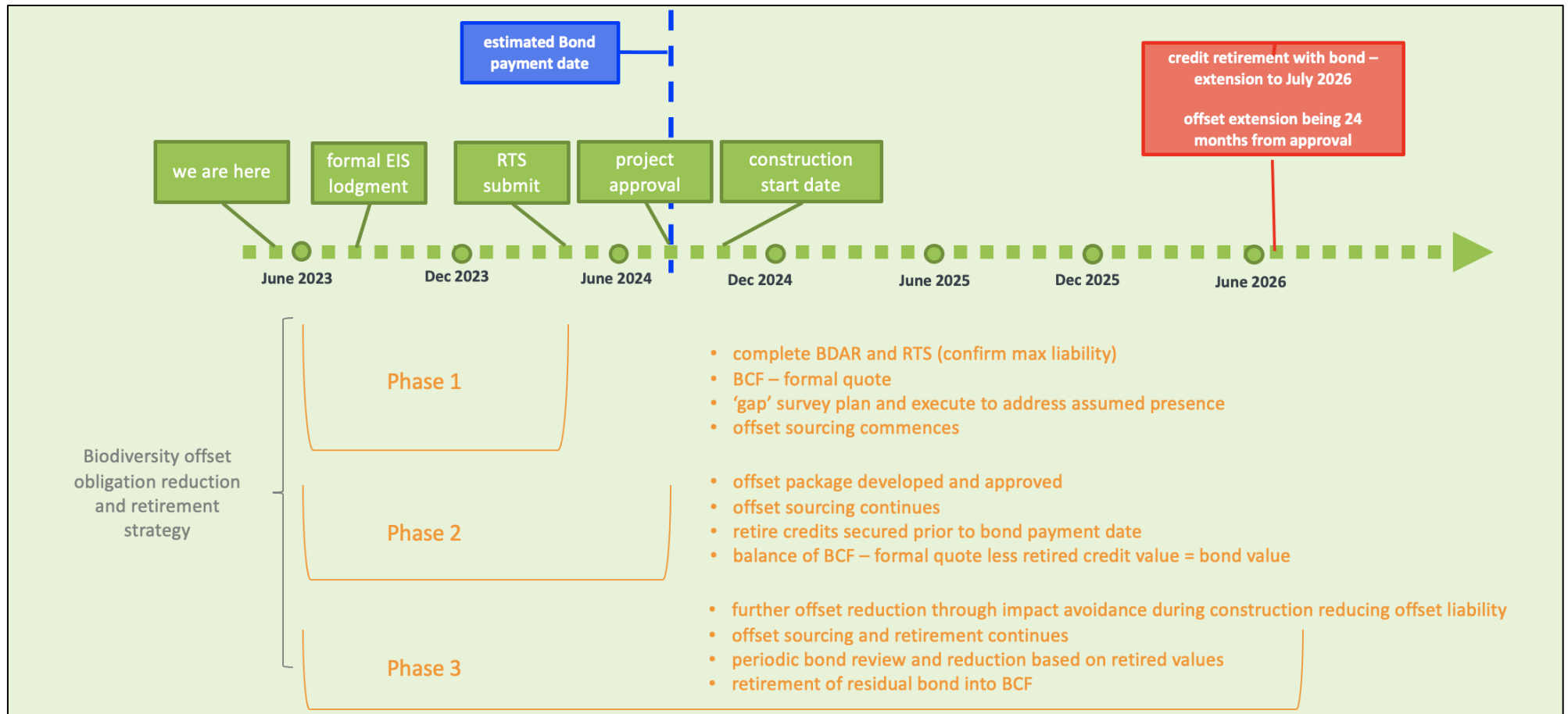
5.3 Phase 3

Phase 3 of the BODS will focus on the retirement of the maximum number of credits that can be sourced prior to the end date of the environmental bond period. The key tasks in this phase will include:

1. Offset site sourcing, establishment and credit generation.

2. Credit retirement.
3. Periodic (suggest three monthly) review of the progress of the BODS towards retirement of the offset obligation.
4. Re-calculation of the maximum project impact to recover the value of the bond equivalent to the impacts avoided through the construction phase of the project.

Figure 4: Schedule for the HumeLink Biodiversity Offset Delivery Strategy



Annex 1: The NSW Biodiversity Offsetting Scheme

What is the NSW Biodiversity Offsetting Scheme?

The NSW Department of Planning and Environment (DPE) states¹⁰:

'The Biodiversity Offsets Scheme is the framework for offsetting unavoidable impacts on biodiversity from development with biodiversity gains through landholder stewardship agreements.'

The Biodiversity Offsets Scheme (BOS) was established under the Biodiversity Conservation Act 2016 (BC Act). Under the BOS, applications for development or clearing approvals must set out how impacts on biodiversity will be avoided and minimised. The remaining residual impacts can be offset by the purchase and/or retirement of biodiversity credits or payment to the Biodiversity Conservation Fund.

Landholders can establish Biodiversity Stewardship Agreements (BSA) on their land to generate biodiversity credits. Selling these credits provides funding to support the long-term management of the biodiversity stewardship site.'

The NSW BOS is predicated on the avoid, minimise, offset hierarchy which broadly speaking requires the following, again from NSW DPE¹¹:

1. first consider whether the development can avoid a negative impact on the environment;
2. next consider whether the development can minimise any negative impacts that cannot be avoided; and
3. once all reasonable steps to avoid or minimise environmental impacts have been exhausted, consider whether any remaining impacts can be offset.

Considerable effort has been expended by the entire HumeLink project team to address this hierarchy. Specifically the BDAR outlines how certain impacts have been avoided through consideration of project design and route alignment and how some impacts will be reduced through the development of specific impact mitigation measures and the planned development and implementation of detailed management plans for the construction and operational phases of the project.

The project cannot however avoid all impacts to biodiversity and as such biodiversity offsets will be necessary. The NSW DPE states that the NSW BOS works in the following manner¹²:

'Biodiversity offsetting is based on the theory that biodiversity values gained at an offset site will compensate for biodiversity values lost to development at another location to achieve a standard of 'no net loss' of biodiversity. An offset site is a location where native vegetation condition and threatened species habitat are protected in perpetuity and can be improved by management actions such as fencing, weed control, pest control and planting native species.'

¹⁰ Source: <https://www.environment.nsw.gov.au/topics/animals-and-plants/biodiversity-offsets-scheme/about-the-biodiversity-offsets-scheme>

¹¹ Source: <https://www.environment.nsw.gov.au/topics/animals-and-plants/biodiversity-offsets-scheme/about-the-biodiversity-offsets-scheme/how-the-biodiversity-offsets-scheme-works>

¹² Source: <https://www.environment.nsw.gov.au/topics/animals-and-plants/biodiversity-offsets-scheme/about-the-biodiversity-offsets-scheme/how-the-biodiversity-offsets-scheme-works>

The primary purpose of offsetting is to facilitate development in an environmentally sustainable manner, and to ensure development does not have unacceptable impacts on native ecosystems and species. Offsetting also provides an incentive to protect biodiversity on private land, provides an income for landholders with offset sites and achieves biodiversity conservation outcomes into the future.'

Under the NSW BOS, biodiversity values gained on biodiversity offset sites and biodiversity values lost on development sites are quantified under the BAM in the form of species credits or ecosystem credits.

Ecosystem credits broadly speaking are defined by the various Plant Community Types (PCTs) across NSW and are constituted by the PCT and the habitat types for threatened species that can be reliably predicted to occur within that PCT. As at mid 2022, there were 1841 PCTs in NSW¹³ that can be aggregated to trade within 359 offset trading groups (OTGs - see below for a detailed explanation). A 2021 review of the NSW BOS noted that 88% of all ecosystem credit OTG's had never been traded¹⁴.

Species credits apply to all other threatened species which are found to occur at that location and cannot be reliably predicted to occur within the identified ecological communities at the development site. Species credits include all threatened flora and some threatened fauna in NSW. A total of 983 different species credit types occur in NSW, of which 97% had never been traded as at March 2021¹⁵, primarily because there were so few species credits on the market.

Consideration must therefore be given to the manner in which credits may be traded to discharge a biodiversity offset obligation and to the various mechanisms available to Transgrid to enable a credit trade through various offset execution pathways.

Offset Trading Rules

Section 6.1 of the NSW *Biodiversity Conservation Regulation 2017* (BC Regulation) defines the trading rules for ecosystem and species credits under the NSW BOS. The rules for trading ecosystem credits have been distilled by the NSW Department of Planning and Environment in their 2023 publication *Offset Rules and Ecosystem Credits – Guidance on Credit Retirement Options for Ecosystem Credits Under the Offset Rules*¹⁶. A summary of the relevant trading rules for ecosystem and species credits are provided below.

Offset Trading Rules – Ecosystem Credits

Broadly speaking, the offset trading rules for ecosystem credits require 'like-for-like' credit retirement of ecosystem credits from the same 'local area' unless the 'variations rules' can apply. To that end 'like-for-like', 'variation rules' and 'local area' require further explanation.

Like for Like Credit Retirement

Like-for-like credit retirement is defined as:

¹³ <https://www.environment.nsw.gov.au/topics/animals-and-plants/biodiversity/nsw-bionet/nsw-plant-community-type-classification>

¹⁴ <https://www.environment.nsw.gov.au/research-and-publications/publications-search/strengthening-the-biodiversity-offsets-scheme-a-new-approach-to-developer-charges>

¹⁵ <https://www.environment.nsw.gov.au/research-and-publications/publications-search/strengthening-the-biodiversity-offsets-scheme-a-new-approach-to-developer-charges>

¹⁶ <chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Animals-and-plants/Biodiversity/offset-rules-and-ecosystem-credits-230051.pdf>

- Impacts on native vegetation being offset with vegetation that is in the same local area as the impact (being the same or adjacent IBRA subregions¹⁷), and
 - if a Threatened Ecological Community (TEC) was impacted, the offset must be for the same TEC, or
 - if other native vegetation (i.e. vegetation that is not a TEC) was impacted, the offset must be vegetation that is the same vegetation class and in the same or higher offset trading group¹⁸
- the offset site must contain hollow bearing trees if the impacted vegetation contained hollow bearing trees.

Variation Rules

The BC Regulation sets out the variation rules for ecosystem credit retirement. The NSW DPE notes that these rules provide increased flexibility to acquit offset obligations by allowing offsetting using a broader suite of biodiversity values and locations. They further note that before applying the variation rules, proponents must seek approval from the decision maker and demonstrate that they have been unable to find like-for-like credits after following the reasonable steps, set out in *the Ancillary rules: Reasonable steps to seek like-for-like biodiversity credits*¹⁹ which are subject to the minimum timeframes shown in Figure 5.

Figure 5: Minimum timeframes to complete reasonable steps to seek like-for-like biodiversity credits

* Days from offset search start date			
30 days*	60 days*	90 days*	Up to 120 days*
Step 1: Contact credit holders on the 'biodiversity credits public register' who own the relevant credits			
Step 2: Contact landholders on the 'biodiversity stewardship site expression of interest public register' who may be able to generate the relevant credits			
Step 3: Place an entry in the 'biodiversity credits wanted public register'			
Accept responses to steps 1, 2 and 3			
Negotiate with anyone who responds			
			Submit application if all negotiation is concluded unsuccessfully. All negotiations can be automatically considered to be concluded unsuccessfully if agreement has not been reached after 120 days from the offset search start date.

¹⁷ IBRA subregions are identified under the Interim Biogeographic Regionalisation for Australia (IBRA) system, which divides Australia into bioregions and subregions on the basis of their dominant landscape-scale attributes.

¹⁸ OTGs for non-threatened vegetation are based on the vegetation class to which the PCT belongs and how extensively the PCT has been cleared since European settlement. The BAM and the offset rules refer to the percentage cleared value as a surrogate for threat status for vegetation not listed as a TEC. OTG's for TEC's consist of groups of PCTs that are associated with the same TEC.

¹⁹ The reasonable steps to seek like-for-like biodiversity credits largely involves existing offset site owners and owners of offset sites pending establishment in the attempt to secure a credit purchase at reasonable credit prices. The proponent is also required to advertise their offset requirements publicly.

The variation rules cannot be applied for impacts on:

- some threatened entities listed in the *Ancillary rules: Impacts on threatened entities excluded from application of variation rules*²⁰ – all critically endangered entities are included on this list.
- threatened species or ecological communities also listed under EPBC Act.

Understanding the ‘local area’

The local area for the project will consist of the same or an adjoining IBRA subregion as the impacted site, or any subregion that is within 100 km of the outer edge of the impacted site.

Importantly, for linear infrastructure such as HumeLink, the project footprint (impacted site) will span multiple IBRA subregions. In our experience, explicit consent conditions confirming that the ‘site’, defined as the entire project footprint, should be sought to ensure the greatest application of the ‘local area’ definition possible.

For clarity, HumeLink spans six IBRA subregions. Taking the ‘local area’ rule at face value might require the offset obligation for the project to be calculated based on the impacts that occur within each IBRA subregion i.e. six discrete offset obligations to which separate ‘local area’ offset rules may be applied. This is a level of complexity never anticipated by the NSW BOS.

When the ‘site’ for the project is defined as the entire project footprint, the ‘local area’ offset rules may be aggregated enabling impacts occurring in any part of the project footprint to be offset anywhere within the ‘local area’ as defined by the entire project footprint (see Figure 6).

Seeking confirmation from the NSW DPE that the impacted site for the project is the entire project footprint is material to the HumeLink Biodiversity Offset Delivery Strategy.

Offset Trading Rules – Species Credits

Trading rules for species credits are generally less complex than for ecosystem credits. Typically, like-for-like rules apply that require offsetting impacts on a threatened species with biodiversity credits that represent the same threatened species.

Local area rules do not typically apply to species credits enabling species credits to be sought from the whole of NSW. It is however possible, under circumstances defined on a project by project basis by the Planning Minister (or their delegate) to apply the local area rules to species credit obligations. In the case of impacts to the koala by the ARTC Inland Rail Project (Narrabri to North Star Phase 1)²¹, condition E26 required the proponent to restrict the source location of koala species credits from the same or adjacent IBRA subregion to that in which the impacts were predicted (where practicable). We recommend early consultation with DPE to address any similar concerns to those raised for the Inland Rail project to persevere to the extent possible, the state wide maximum geographical area from which to source species credits for HumeLink.

Section 6.4 (c) of the BC Regulations provide for the variation rules for species credit trades. It states that the ordinary offset rules for the determination of the like-for-like credits may be varied as follows:

²⁰ <https://www.environment.nsw.gov.au/research-and-publications/publications-search/ancillary-rules-impacts-on-threatened-species-and-ecological-communities>

²¹ <https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSI-7474%2120200814T061727.837%20GMT>.

‘(c) In the case of impacts on threatened species that are species credit species—the credits to be retired need not represent the same threatened species, so long as—

- (i) if the impacted species is a plant—they represent a plant, and
- (ii) if the impacted species is an animal—they represent an animal, and
- (iii) they represent a species that has the same or a higher category of listing under Part 4 of the Act as a threatened species, and
- (iv) they represent a location that is in—
 - (A) the same or an adjoining Interim Biogeographic Regionalisation of Australia subregion as the impacted site, or
 - (B) any such subregion that is within 100 kilometres of the outer edge of the impacted site.

Application of the variation rules for species credits are subject to approval from DPE and also to the minimum timeframes shown in Figure 5. Transgrid should consider the application of the variation rules for species credits noting that such an application may lead to significant cost savings on a per credit basis.

Alternatives to retiring credits: Ancillary Rules: Biodiversity conservation actions

Clause 6.5 of the BC Regulation provides for alternatives to the retirement of credits through the performance of certain, limited, biodiversity conservation actions. The DPE has published a summary²² of the rules and actions which states:

‘The offset rules established by the Biodiversity Conservation Regulation 2017 (the Regulation) allows a person with an obligation to retire biodiversity credits to fund biodiversity conservation actions to offset impacts under the biodiversity offsets scheme. The Regulation also allows the Chief Executive of the Office of Environment and Heritage (OEH) to publish ancillary rules that set out the actions that can be funded as biodiversity conservation actions.

Using a biodiversity conservation action to meet an offset obligation must be financially equivalent to the cost of acquiring the required biodiversity credits. This is achieved by calculating the funding amount required using the offsets payment calculator as in force from time to time under section 6.32 of the Biodiversity Conservation Act 2017 to determine the cost of retirement of like-for-like credits as required under the Regulation.

The listed biodiversity conservation actions focus on:

- *threatened species that are difficult to effectively manage at a biodiversity stewardship site due to limited understanding of its ecology, threats or management requirements*
- *threatened species with a limited known distribution where research to find more locations where the entity is present will be beneficial.*

Office of Environment and Heritage will regularly review the list of biodiversity conservation actions to identify new actions and remove actions that have already received funding.’

²² <https://www.environment.nsw.gov.au/research-and-publications/publications-search/ancillary-rules-biodiversity-conservation-actions>

The alternative execution pathway to securing credits from the market is to pay in to the BCF. It is possible that circumstances might arise for some species or ecosystem credits where paying into the BCF will be insufficient for the CST to secure those credits on the market also. For example in the case of very localised species or ecosystem credits that occur on landholdings that are unsuitable for establishment of a BSA.

Annex 2: Biodiversity offset execution pathways – qualitative assessment

Section 1 of the report notes that the HumeLink BDAR has identified several pathways for the execution of the Biodiversity Offset Strategy. In essence it notes three broad opportunities which include:

1. Generate the supply credits from offset sites that Transgrid owns (or properties it purchases to establish a BSA).
2. Purchase of credits from the existing market.
3. Payment into the BCF.

Notwithstanding the potential for Transgrid to seek to access the Biodiversity Conservation Action (Ancillary Rules) should it desire to do so, the offset obligation for the project will be primarily discharged through one of the three execution pathways noted above. Table 2 (Annex 2) presents a qualitative assessment of these three biodiversity offset execution pathways.

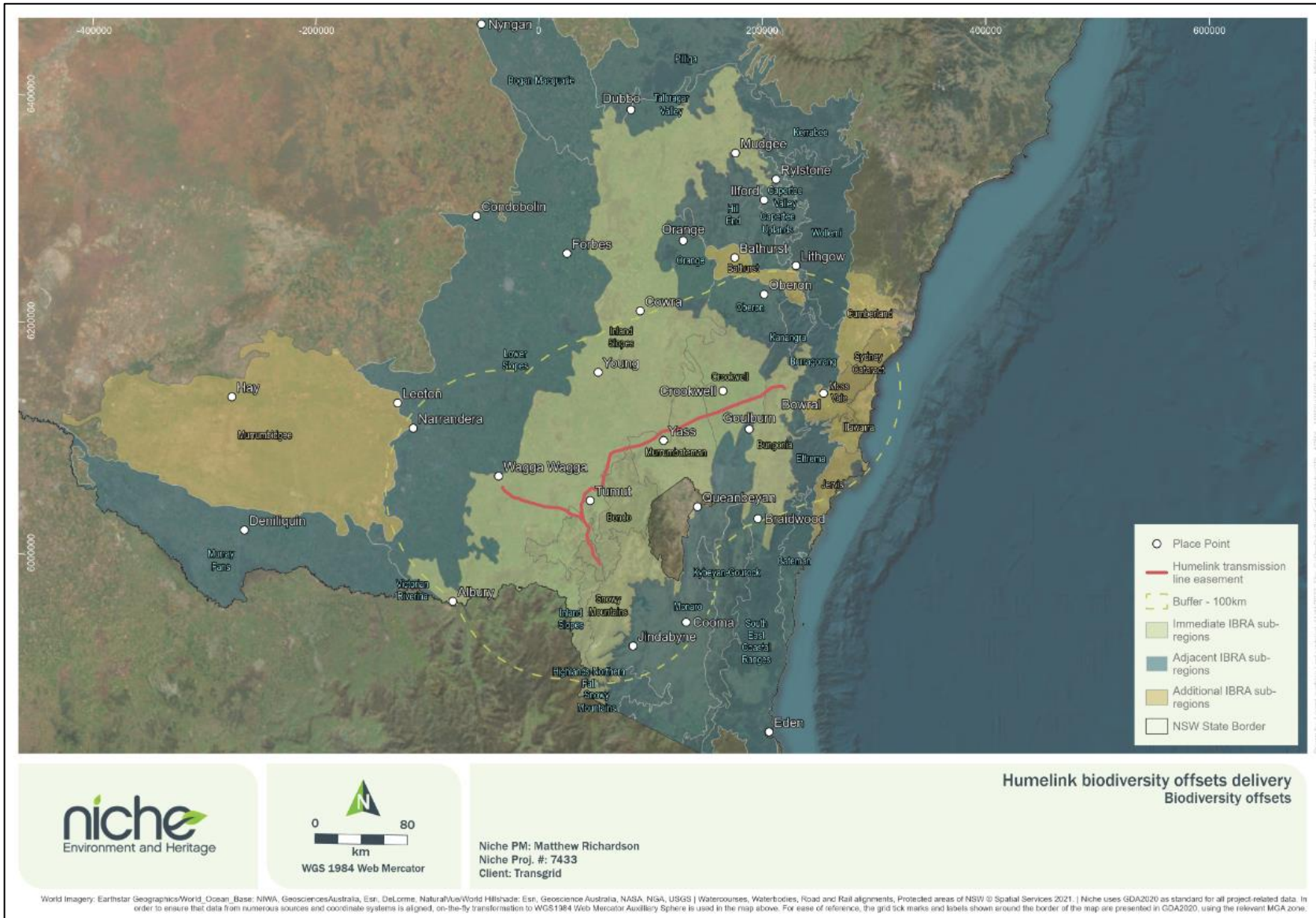
Table 2: Qualitative assessment of execution pathways ordered generally via expected cost from least to most expensive

Offset Execution Pathway	Description	Advantages	Disadvantages
Generate credits			
Existing BSA on land owned by Transgrid	<ul style="list-style-type: none"> Transgrid has developed several BSA's for Project Energy Connect (PEC) Residual credits at those sites (subject to like for like and local area trading rules) could support the offset obligation for HumeLink 	<ul style="list-style-type: none"> Credits are already owned by Transgrid and therefore immediately available Credit types and volume are known with certainty De-risks landholder negotiation process (c.f. proponent sponsored BSA) Likely the least expensive option 	<ul style="list-style-type: none"> Landholding, land management and other secondary costs may not have been factored into the cost benefit analysis for which these sites were established CGT issues not initially recognised Divestment strategy required for landholdings
New land purchase + BSA establishment	<ul style="list-style-type: none"> Purchasing landholdings with relevant biodiversity values in order to establish a BSA to supply credits to the HumeLink Project. 	<ul style="list-style-type: none"> Likely the second least expensive option for credit generation subject to correct assessment of secondary costs²³ De-risks landholder negotiation process (c.f. proponent sponsored BSA) Traditional land acquisition negotiations at play (i.e. does not require a high level of experience with the NSW BOS) Opportunity for alternative land use which may add value to Transgrid (e.g. sustainability projects) Site can support credit supply to multiple projects if located correctly and credit types are common across projects Opportunity to generate species credits on site, adding value to ecosystem credit generation 	<ul style="list-style-type: none"> Timeframes for credit generation will be slow (land purchase + BSA establishment likely to be 12-24 months) Credit types and volume may change from expected outcomes – this risk needs to be managed appropriately prior to purchase wherever possible Residual landholdings potentially an encumbrance from a land management perspective Capital Gains Tax (CGT) implications for BSA establishment resides with proponent Land management requirements necessitates a land management team or outsourcing to asset management contractor with costs not always factored into the original cost structure Requires high level of commitment from proponents with regard to leadership and governance structure to acquire and hold land Land acquisition is a medium to long term option (5+ years) Divestment strategy required for landholdings
Purchase credits from market (including proponent sponsored credit generation and purchase)			
Direct purchase from market (existing or	<ul style="list-style-type: none"> Approaching the market for a direct credit purchase (note various commercial mechanisms are available for this approach) 	<ul style="list-style-type: none"> Relatively quick No ongoing land management or CGT responsibility for purchaser Should be less expensive than paying into the BCF 	<ul style="list-style-type: none"> Will have to purchase species credits separate to ecosystem credits although these might be bundled in negotiations if same seller holds both credit types May be second most expensive option for credit purchase

²³ Secondary costs relate to the management of the property, land holding costs, divestment costs, land tax and rates.

Offset Execution Pathway	Description	Advantages	Disadvantages
pending credits)		<ul style="list-style-type: none"> • Good option for credit types that exist on the market in high volumes and for which multiple suppliers exist (genuine price competition) • Good option for small volume credit sales to ‘mop up’ residual credit obligation if credits exist on market (c.f. paying into the BCF) • Potential for Transgrid to purchase relatively inexpensive credits (particularly species credits) in anticipation of approval from DPE to apply the variation rules 	<ul style="list-style-type: none"> • Potential reputational risks associated with the use of the variation rules exist and should be carefully considered by Transgrid, particularly in relation to species credits
Discounted on market purchase through sponsored BSA	<ul style="list-style-type: none"> • Supporting landholders to establish a BSA on their property in return for excellent value transaction on credits required from the site (note various commercial mechanisms are available for this approach) 	<ul style="list-style-type: none"> • Subject to contracting approach, could be equal cheapest option for credit acquisition • Land ownership not required by proponent therefore avoids encumbrances and costs of land management and divestment • Assists landholders to de risk their entry into the NSW BOS who might otherwise be reluctant to supply necessary credits to the market • Genuinely seen as a community support mechanism (creating opportunities for landholders) • Can tailor the shape, size and location of the BSA on the landholders property to maximise generation of credits required and not pay for establishment of credits that are not required, or use minimal additional cost outlay to increase the size of a BSA beyond the target credits (but to the satisfaction of the landholder) in return for improved credit pricing 	<ul style="list-style-type: none"> • Requires time (approx. 12 -18 months but could be longer if site ID and landowner negotiations are protracted) to identify sites, negotiate agreement and establish BSA before credits are generated • Requires high level of support from NSW BOS experts who are capable of supporting commercial strategies and negotiation with landholders • Requires proponent to support landholders through the process • Requires strong process to secure binding landholder commitment to ensure they do not backout of the agreement • Cannot be used as a mechanism to please all landholders (no mechanism can) – this mechanism tends to favour landholders with larger sites and good commercial acumen
Pay into the BCF			
BCF	<ul style="list-style-type: none"> • Direct payment into the BCF 	<ul style="list-style-type: none"> • Fastest option for credit retirement • Certainty on pricing for a given period • No market interaction necessary • No limit on credit type or volume availability • Completely outsources offset responsibility to the Credits Supply Taskforce 	<ul style="list-style-type: none"> • Most expensive option on a credit by credit basis however the cost of certain credits may be close to expected market costs (NB there is a current 20% price increase cap on certain ecosystem credits) • Expected prices may change if credits are not purchased within relevant timeframes of a quote • May be viewed negatively by community and regulators if only pathway employed

Figure 6: 'Local Area' catchment for sourcing ecosystem credits for the HumeLink project



Annex 3: HumeLink Biodiversity Offset Obligation

Ecosystem Credits

The BDAR for the project identified 42 PCT's within the project development footprint²⁴. Several of the PCTs are vegetation communities that are constituent PCTs for Threatened Ecological Communities (TECs) that are listed on either the NSW BC Act or the Commonwealth EPBC Act.

Table 3 describes the PCTs within the project development footprint and includes the assessment from the BDAR (submitted to DPE) that a total of 11,104 ecosystem credits are required to offset impacts of the project to vegetation communities (i.e. does not include species credit species).

Since lodgement of the BDAR an additional allowance has been made to cater for 20% increased impacts from the project due to increased clearing requirements for access tracks, compounds and Hazard Tree Zones. This increase has not been applied within Table 3 to Table 7 below.

Table 3: Ecosystem credits offset obligation (not including additional 20% due to increased clearing requirements)

PCT	PCT name	Corresponding TEC	Total credits
5	River Red Gum herbaceous-grassy very tall open forest wetland on inner floodplains	-	27
266	White Box grassy woodland	White Box Yellow Box Blakely's Red Gum Woodland	319
268	White Box - Blakely's Red Gum - Long-leaved Box - Norton's Box - Red Stringybark grass-shrub woodland on shallow soils on hills	White Box Yellow Box Blakely's Red Gum Woodland	509
277	Blakely's Red Gum - Yellow Box grassy tall woodland	White Box Yellow Box Blakely's Red Gum Woodland	1129
278	Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest	White Box Yellow Box Blakely's Red Gum Woodland	128
280	Red Stringybark - Blakely's Red Gum +/- Long-leaved Box shrub/grass hill woodland	White Box Yellow Box Blakely's Red Gum Woodland	849
283	Apple Box - Blakely's Red Gum moist valley and footslopes grass-forb open forest	White Box Yellow Box Blakely's Red Gum Woodland	102
285	Broad-leaved Sally grass - sedge woodland on valley flats and swamps	-	9
287	Long-leaved Box - Red Box - Red Stringybark mixed open forest	-	37
290	Red Stringybark - Red Box - Long-leaved Box - Inland Scribbly Gum tussock grass - shrub low open forest on hills	-	66
294	Norton's Box - Red Box - White Box tussock grass open forest	-	1
295	Robertson's Peppermint - Broad-leaved Peppermint - Norton's Box - stringybark shrub-fern open forest	-	29

²⁴ The BDAR for the project (as at Early 2023) identified the presence of each of the TECs within the six IBRA sub-regions that the project traverses. This distinction has been removed for the purposes of this document on the assumption that the project as a whole will be considered as the development site allowing Transgrid to seek biodiversity offsets from the maximum geographical footprint).

296	Brittle Gum - peppermint open forest of the Woomargama to Tumut region	-	1
297	Red Stringybark - Red Box - Long-leaved Box - Inland Scribbly Gum tussock grass - shrub low open forest on hills	-	11
299	Riparian Ribbon Gum - Robertson's Peppermint - Apple Box riverine very tall open forest	-	5
299	Riparian Ribbon Gum - Robertson's Peppermint - Apple Box riverine very tall open forest	-	27
300	Ribbon Gum - Narrow-leaved (Robertson's) Peppermint montane fern - grass tall open forest on deep clay loam soils	-	373
301	Drooping Sheoke - Ricinocarpus bowmannii - grasstree tall open shrubland of the Coolac - Tumut Serpentinite Belt	Coolac-Tumut Serpentinite Shrubby Woodland	28
306	Red Box - Red Stringybark - Norton's Box hill heath shrub - tussock grass open forest of the Tumut region	-	58
314	Apple Box - Red Stringybark basalt scree open forest in the upper Murray River region	-	393
316	Norton's Box - Red Box - Red Stringybark +/- Nodding Flax Lily forb-grass open forest	-	292
319	Tumbledown Red Gum - White Cypress Pine hill woodland	-	22
322	Inland Scribbly Gum - Red Stringybark - Black Cypress Pine hillslope shrub-tussock grass open forest	-	14
335	Tussock grass - sedgeland fen - - rushland - reedland wetland in impeded creeks in valleys in the upper slopes sub-region of the NSW South-Western Slopes Bioregion	-	26
343	Mugga Ironbark - Red Box - Red Stringybark - Western Grey Box grass/shrub woodland on metamorphic substrates in the Tarcutta - Gundagai region	-	51
349	Inland Scribbly Gum - Red Stringybark open forest on hills composed of silicious substrates	-	46
351	Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest	-	71
352	Red Stringybark - Blakely's Red Gum hillslope open forest on meta-sediments in the Yass - Boorowa - Crookwell region	White Box Yellow Box Blakely's Red Gum Woodland	46
638	Alpine Ash - Mountain Gum moist shrubby tall open forest of montane areas	-	377
679	Black Sallee - Snow Gum low woodland of montane valleys, South-Eastern Highlands Bioregion and Australian Alps Bioregion	Monaro Tableland Cool Temperate Grassy Woodland	17
		-	56
727	Broad-leaved Peppermint - Brittle Gum - Red Stringybark dry open forest	-	59
731	Broad-leaved Peppermint - Red Stringybark grassy open forest on undulating hills	-	172
870	Grey Gum - Thin-leaved Stringybark grassy woodland	-	40
939	Montane wet heath and bog of the eastern tablelands	Montane Peatlands and Swamps	13

952	Mountain Gum - Narrow-leaved Peppermint - Snow Gum dry shrubby open forest on undulating tablelands	Tableland Basalt Forest	16
953	Mountain Gum - Snow Gum - Broad-leaved Peppermint shrubby open forest of montane ranges	Tableland Basalt Forest	579
		-	1482
1093	Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest	-	339
1093	Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest	-	312
1097	Ribbon Gum - Narrow-leaved Peppermint grassy open forest on basalt plateaux	Tableland Basalt Forest	1
1107	River Peppermint - Narrow-leaved Peppermint open forest on sheltered escarpment slopes	Tableland Basalt Forest	11
1150	Silvertop Ash - Blue-leaved Stringybark shrubby open forest on ridges	-	166
1151	Silvertop Ash - Broad-leaved Peppermint dry shrub forest	-	375
1191	Snow Gum - Candle Bark woodland on broad valley flats of the tablelands and slopes	Monaro Tableland Cool Temperate Grassy Woodland	0
		-	3
1196	Snow Gum - Mountain Gum shrubby open forest of montane areas	-	473
1224	Sub-alpine dry grasslands and heathlands of valley slopes	-	8
1256	Tableland swamp meadow on impeded drainage sites	Montane Peatlands and Swamps	3
1330	Yellow Box - Blakely's Red Gum grassy woodland on the tablelands	White Box Yellow Box Blakely's Red Gum Woodland	1826
Total			10997

Threatened Ecological Communities

Five threatened ecological communities (TECs) listed under the BC Act were recorded or considered likely to occur within the project footprint:

- White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South-Eastern Highlands, NSW South-Western Slopes, South-East Corner and Riverina Bioregion (critically endangered under the BC Act)
- Coolac-Tumut Serpentine Shrubby Woodland in the NSW South-Western Slopes and South-Eastern Highlands Bioregions (endangered under the BC Act)
- Tableland Basalt Forest in the Sydney Basin and South-Eastern Highlands Bioregions (endangered under the BC Act)

- Montane Peatlands and Swamps of the New England Tableland, NSW North Coast, Sydney Basin, South-East Corner, South-Eastern Highlands and Australian Alps bioregion (endangered under the BC Act)
- Monaro Tableland Cool Temperate Grassy Woodland in the South-Eastern Highlands Bioregion (critically endangered under the BC Act).

Two TECs listed under the EPBC Act were recorded or considered likely to occur within the project footprint:

- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (critically endangered under the EPBC Act)

Alpine Sphagnum Bogs and Associated Fens (endangered under the EPBC Act) Existing ecosystem credits

The BDAR for the project includes a preliminary assessment of the availability of ecosystem credits at existing offset sites that could be used to satisfy the projects offset obligation for ecosystem credits based on the project's offset requirement in May 2023. There has been a modest (1%) decrease in the ecosystem offset requirement between May and August 2023 when the final BDAR was lodged and given the magnitude of this change the data presented is based on the calculated ecosystem offset requirement in May 2023. It noted that that there is generally a good current supply of many of the required ecosystem credits for the project from within the required trading areas with the exception of the Snowy IBRA subregion. The analysis did not take into account sites where expressions of interest have been lodged or where a stewardship site is currently under development. Further, the analysis did not consider Niche's Biodiversity Offset Exchange (BOE) database that has accumulated information on the biodiversity values on over one hundred properties in NSW through preliminary offset site assessments completed over the last decade. These properties are candidate offset sites which could be considered by Transgrid as potential credit supply sources.

The assumption of the current assessment is that Transgrid will have access to a larger pool of credits than those available within the six IBRA subregions of the project development footprint and therefore the assessment of ecosystem volumes should be reproduced within the larger offset source catchment.

The assessment of available ecosystem credits in Table 4 does not take into consideration the OTGs for non-TEC PCTs which would act to further improve the volume of existing ecosystem credits available for consideration for the project. Further, Table 4 and

Table 5 indicate that a number of ecosystem credits (either like for like or variation trades under the OTG) are not currently available on existing offset sites within the six IBRA subregions of the project development footprint. Those credit types must therefore be acquired through other means.

Table 4: Proportion of credits for TEC trade groups currently available at registered sites based on Humelink expected demand for each IBRA subregion (not factoring in additional 20% credit liability due to increased clearing requirements)

IBRA subregion	TEC	Proportion of credits available on market*
Bondo	White Box Yellow Box Blakely's Red Gum Woodland	614%
Bungonia	White Box Yellow Box Blakely's Red Gum Woodland	902%
Crookwell	Tableland Basalt Forest in the Sydney Basin and South Eastern Highlands Bioregions	126%
Snowy Mountains	White Box Yellow Box Blakely's Red Gum Woodland	83%
Inland Slopes	White Box Yellow Box Blakely's Red Gum Woodland	54%
Murrumbateman	White Box Yellow Box Blakely's Red Gum Woodland	19%

* subject to changes based on either trades that occur since the data was collected or because some credits identified as available on the market are already secured against future impacts and not yet retired.

Table 5: Proportion of credits for non-TEC trade groups currently available at registered sites (not factoring in additional 20% credit liability due to increased clearing requirements).

IBRA subregion	Demand PCT #	Demand PCT name	Proportion of credits available on market (as at early 2023)*
Bondo	299	Riparian Ribbon Gum - Robertson's Peppermint - Apple Box riverine very tall open forest of the NSW South Western Slopes Bioregion and South Eastern Highlands Bioregion	913%
Bungonia	870	Grey Gum - Thin-leaved Stringybark grassy woodland of the southern Blue Mountains gorges, Sydney Basin Bioregion	300%
	1093	Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion	251%
	1150	Silvertop Ash - Blue-leaved Stringybark shrubby open forest on ridges, north east South Eastern Highlands Bioregion	124%
Crookwell	727	Broad-leaved Peppermint - Brittle Gum - Red Stringybark dry open forest on the South Eastern Highlands Bioregion	393%
	731	Broad-leaved Peppermint - Red Stringybark grassy open forest on undulating hills, South Eastern Highlands Bioregion	24%
	1093	Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion	85%
Inland Slopes	5	River Red Gum herbaceous-grassy very tall open forest wetland on inner floodplains in the lower slopes sub-region of the NSW South Western Slopes Bioregion and the eastern Riverina Bioregion.	218%
	85	River Oak forest and woodland wetland of the NSW South Western Slopes and South Eastern Highlands Bioregion	6133%
	217	Mugga Ironbark - Western Grey Box - cypress pine tall woodland on footslopes of low hills in the NSW South Western Slopes Bioregion	3200%
	287	Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion	366%
	290	Red Stringybark - Red Box - Long-leaved Box - Inland Scribbly Gum tussock grass - shrub low open forest on hills in the southern part of the NSW South Western Slopes Bioregion	255%
	297	Broad-leaved Peppermint - Norton's Box - Red Stringybark tall open forest on red clay on hills in the southern part of the NSW South Western Slopes Bioregion	429%
	299	Riparian Ribbon Gum - Robertson's Peppermint - Apple Box riverine very tall open forest of the NSW South Western Slopes Bioregion and South Eastern Highlands Bioregion	1345%
	301	Drooping Sheoke - Ricinocarpus bowmannii - grasstree tall open shrubland of the Coolac - Tumut Serpentinite Belt	49%
	306	Red Box - Red Stringybark - Norton's Box hill heath shrub - tussock grass open forest of the Tumut region	365%
	314	Apple Box - Red Stringybark basalt scree open forest in the upper Murray River region	66%
Murrumbateman	287	Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion	392%
	322	Inland Scribbly Gum - Red Stringybark - Black Cypress Pine hillslope shrub-tussock grass open forest on mainly sandstone ranges in the NSW central western slopes	6%
	349	Inland Scribbly Gum - Red Stringybark open forest on hills composed of silicious substrates in the mid-Murrumbidgee and upper Lachlan catchments mainly in the western South Eastern Highlands Bioregion	163%

IBRA subregion	Demand PCT #	Demand PCT name	Proportion of credits available on market (as at early 2023)*
	351	Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion	54%
	731	Broad-leaved Peppermint - Red Stringybark grassy open forest on undulating hills, South Eastern Highlands Bioregion	85%
	1093	Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion	24%

* subject to changes based on either trades that occur since the data was collected or because some credits identified as available on the market are already secured against future impacts and not yet retired.

Offset Trading Groups

A total of 42 PCTs will be impacted within the project development footprint and therefore attract an offsetting obligation under the NSW BOS. As noted elsewhere, several of these PCTs can be grouped into OTGs. Preliminary analysis of the 42 PCTs within the development footprint indicates that they can be grouped into 27 OTGs from which the ecosystem credits for the project can be obtained.

Table 6 presents a preliminary analysis of the PCTs and their relevant OTGs. Subject to changes that may occur in the project footprint, and any changes that may occur within the NSW BOS or NSW BAM prior to sourcing ecosystem credits, this analysis should be undertaken again at that time.

Subject to the final agreed offset delivery approach for HumeLink, the distribution of the OTGs should inform the location from which ecosystem credits may be sourced. Synergies will exist where OTGs overlap in their distribution. At these locations Transgrid may seek to acquire landholdings with the relevant values or enter into a form of credit supply agreement with landholders in those locations. This information is currently held within Niche's BOE for use in the execution phase of the offsets delivery program.

Table 6: Preliminary assessment of PCT offset trading groups – Ecosystem credits (not factoring in additional 20% credit liability due to increased clearing requirements)

PCT	PCT name	Corresponding TEC	OTG	OTG – Can Trade with these PCT's	Credits Required by OTG (approx.)	Approximate Area (ha) of offset site required by OTG ²⁵	% of HumeLink Ecosystem Credit Offset Liability
870	Grey Gum - Thin-leaved Stringybark grassy woodland	-	Central Gorge Dry Sclerophyll Forests <50%	778, 821, 832, 840, 858, 860, 870, 871, 873, 3081, 3472, 3473, 3474, 3475, 3476, 3477, 3478, 3488, 3489, 3490, 3491, 3493, 3494, 3495, 3496, 3497, 3498, 3499, 3509	40	4	0.36%
335	Tussock grass - sedgeland fen - - rushland - reedland wetland in impeded creeks in valleys in the upper slopes sub-region of the NSW South-Western Slopes Bioregion	-	Inland Floodplain Swamps >70% <90%	66, 204, 205, 335, 360, 447, 465, 1291,	26	2.6	0.24%
5	River Red Gum herbaceous-grassy very tall open forest wetland on inner floodplains	-	Inland Riverine Forests <50%	2, 5, 7, 8, 9, 10, 11, 36, 78, 79, 112, 233, 234, 249, 356, 362, 4088, 4089	27	2.7	0.25%
319	Tumbledown Red Gum - White Cypress Pine hill woodland	-	Inland Rocky Hill Woodlands >50%<70%	177, 178, 318, 319	22	2.2	0.20%
679	Black Sallee - Snow Gum low woodland of montane valleys, South-Eastern Highlands Bioregion and Australian Alps Bioregion	Monaro Tableland Cool Temperate Grassy Woodland	Monaro Tableland Cool Temperate Grassy Woodland	679, 797, 802, 803, 804, 1100, 1101, 1191, 1197, 1199, 1229, 1295, 3341, 3413	76	19	0.69%
1191	Snow Gum - Candle Bark woodland on broad valley flats of the tablelands and slopes	Monaro Tableland Cool Temperate Grassy Woodland	Monaro Tableland Cool Temperate Grassy Woodland				
939	Montane wet heath and bog of the eastern tablelands	Montane Peatlands and Swamps	Montane Peatlands and Swamps of the New England Tableland, NSW North Coast, Sydney Basin, South East Corner, South Eastern Highlands and Australian Alps bioregions	518, 607, 637, 665, 681, 766, 788, 805, 939, 1188, 1200, 1256, 1270	15	3.75	0.14%

²⁵ Assuming 4 c/ha generated on offset site

PCT	PCT name	Corresponding TEC	OTG	OTG – Can Trade with these PCT’s	Credits Required by OTG (approx.)	Approximate Area (ha) of offset site required by OTG ²⁵	% of HumeLink Ecosystem Credit Offset Liability
1256	Tableland swamp meadow on impeded drainage sites	Montane Peatlands and Swamps	Montane Peatlands and Swamps of the New England Tableland, NSW North Coast, Sydney Basin, South East Corner, South Eastern Highlands and Australian Alps bioregions				
638	Alpine Ash - Mountain Gum moist shrubby tall open forest of montane areas	-	Montane Wet Sclerophyll Forests <50%	638, 639, 3306, 3307, 3309, 3310, 3311	377	94.25	3.43%
1150	Silvertop Ash - Blue-leaved Stringybark shrubby open forest on ridges	-	South East Dry Sclerophyll Forests <50%	716, 879, 891, 892, 901, 932, 946, 1082, 1084, 1146, 1147, 1148, 1149, 1150, 1151, 1154, 1155, 1157, 1158, 1160, 1161, 1322, 1338, 1339, 1340, 330, 3492, 3642, 3643, 3644, 3645, 3646, 3648, 3649, 3650, 3651, 3652, 3653, 3654, 3655, 3656, 3657, 3658, 3659, 3660, 3661, 3662, 3663, 3664, 3665, 3666, 3667, 3668	166	41.5	1.51%
1151	Silvertop Ash - Broad-leaved Peppermint dry shrub forest	-	South East Dry Sclerophyll Forests >70% <90%	1151	375	93.75	3.41%
1107	River Peppermint - Narrow-leaved Peppermint open forest on sheltered escarpment slopes	-	Southern Escarpment Wet Sclerophyll Forests <50%	706, 742, 743, 744, 878, 929, 943, 963, 968, 969, 1107, 1144, 1254, 1301, 1615, 1616, 3209, 3210, 3211, 3212, 3213, 3214, 3215, 3216, 3217, 3218, 3219, 3220, 3221, 3222, 3223, 3224, 3225, 3226, 3227, 3228, 3229	8	2	0.07%
296	Brittle Gum - peppermint open forest of the Woomargama to Tumut region		Southern Tableland Dry Sclerophyll Forests <50%	296,299, 307, 344, 345, 349, 351, 352, 649, 652, 653, 700, 701, 727, 728, 729, 730, 888, 911, 912, 953, 957, 999, 1089, 1093, 1177, 3730, 3731, 3732, 3734, 3735, 3736, 3737, 3738,	1	0.25	0.01%

PCT	PCT name	Corresponding TEC	OTG	OTG – Can Trade with these PCT’s	Credits Required by OTG (approx.)	Approximate Area (ha) of offset site required by OTG ²⁵	% of HumeLink Ecosystem Credit Offset Liability
				3739, 3741, 3742, 3743, 3744, 3745, 3746, 3747, 3749, 4126			
299	Riparian Ribbon Gum - Robertson’s Peppermint - Apple Box riverine very tall open forest	-	Southern Tableland Dry Sclerophyll Forests >50% <70%	299, 344, 349, 351, 352, 653, 701, 727, 728, 730, 888, 957, 1093, 1177, 3730, 3732, 3734, 3735, 3737, 3738, 3741, 3743, 3744, 3746, 3747,	865	216.25	7.86%
349	Inland Scribbly Gum - Red Stringybark open forest on hills composed of siliceous substrates	-	Southern Tableland Dry Sclerophyll Forests >50% <70%				
727	Broad-leaved Peppermint - Brittle Gum - Red Stringybark dry open forest	-	Southern Tableland Dry Sclerophyll Forests >50% <70%				
351	Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest	-	Southern Tableland Dry Sclerophyll Forests >50% <70%				
1093	Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest	-	Southern Tableland Dry Sclerophyll Forests >50% <70%				
731	Broad-leaved Peppermint - Red Stringybark grassy open forest on undulating hills	-	Southern Tableland Grassy Woodlands >70% <90%	303, 312, 350, 654, 680, 703, 705, 731, 1103, 1330, 1334, 1501, 3366, 3367, 3368, 3370, 3372, 3373, 3374, 3376, 3377,	173	43.25	1.57%
295	Robertson’s Peppermint - Broad-leaved Peppermint - Norton’s Box - stringybark shrub-fern open forest		Southern Tableland Wet Sclerophyll Forests <50%	295, 300, 719, 792, 880, 944, 951, 1070, 1096, 1097, 1197, 1319, 3198, 3291, 3292, 3293, 3294, 3295, 3296, 3297, 3298, 3299, 3301, 3302, 3303, 3304, 3305	403	100.75	3.66%
300	Ribbon Gum - Narrow-leaved (Robertson’s) Peppermint montane fern - grass tall open forest on deep clay loam soils	-	Southern Tableland Wet Sclerophyll Forests <50%				

PCT	PCT name	Corresponding TEC	OTG	OTG – Can Trade with these PCT's	Credits Required by OTG (approx.)	Approximate Area (ha) of offset site required by OTG ²⁵	% of HumeLink Ecosystem Credit Offset Liability
1097	Ribbon Gum - Narrow-leaved Peppermint grassy open forest on basalt plateaux	-	Southern Tableland Wet Sclerophyll Forests >90%	1097, 1197, 3295	1	0.25	0.01%
1196	Snow Gum - Mountain Gum shrubby open forest of montane areas	-	Subalpine Woodlands <50%	644, 645, 650, 677, 679, 952, 1190, 1191, 1196, 1199, 3379, 3380, 3381, 3382, 3383, 3384, 3385	479	119.75	4.35%
953	Mountain Gum - Snow Gum - Broad-leaved Peppermint shrubby open forest of montane ranges	Tableland Basalt Forest	Tableland Basalt Forest in the Sydney Basin and South Eastern Highlands Bioregions	730, 742, 744, 802, 951, 952, 953, 963, 1070, 1097, 1100, 1101, 1102, 1103, 1107, 1196, 1197, 1254, 3295, 3305, 3366,	2077	519.25	18.87%
952	Mountain Gum - Narrow-leaved Peppermint - Snow Gum dry shrubby open forest on undulating tablelands	Tableland Basalt Forest in the Sydney Basin and South-Eastern Highlands Bioregions	Tableland Basalt Forest in the Sydney Basin and South Eastern Highlands Bioregions				
1224	Sub-alpine dry grasslands and heathlands of valley slopes	-	Temperate Montane Grasslands <50%	569*, 586, 797, 802, 803, 804, 893, 894, 895, 896, 1100, 1185, 1186, 1187, 1202, 1224, 1225, 1288, 1289, 1298, 3378, 3412, 3413, 3414, 3415, 3416	8	2	0.07%
294	Norton's Box - Red Box - White Box tussock grass open forest		Upper Riverina Dry Sclerophyll Forests <50%	269, 285, 288, 289, 290, 293, 294, 297, 298, 302, 304, 305, 306, 310, 311, 313, 314, 315, 338, 339, 340, 342, 353, 1087, 1088, 1094, 1095, 1309, 3510, 3534, 3535, 3536, 3537, 3538, 3540, 3541, 3542, 3543, 4152	60	15	0.55%
297	Red Stringybark - Red Box - Long-leaved Box - Inland Scribbly Gum tussock grass - shrub low open forest on hills	-	Upper Riverina Dry Sclerophyll Forests <50%				
306	Red Box - Red Stringybark - Norton's Box hill heath shrub - tussock grass open forest of the Tumut region	-	Upper Riverina Dry Sclerophyll Forests <50%				
314	Apple Box - Red Stringybark basalt scree open forest in the upper Murray River region	-	Upper Riverina Dry Sclerophyll Forests >50% <70%	269, 285, 289, 290, 298, 302, 304, 314, 338, 339, 340, 342, 353, 1088,	459	114.75	4.17%

PCT	PCT name	Corresponding TEC	OTG	OTG – Can Trade with these PCT’s	Credits Required by OTG (approx.)	Approximate Area (ha) of offset site required by OTG ²⁵	% of HumeLink Ecosystem Credit Offset Liability
290	Red Stringybark - Red Box - Long-leaved Box - Inland Scribbly Gum tussock grass - shrub low open forest on hills		Upper Riverina Dry Sclerophyll Forests >50%<70%	1094, 1095, 3533, 3534, 3535, 3536, 3537, 3540, 3541, 3542, 4152			
285	Broad-leaved Sally grass - sedge woodland on valley flats and swamps		Upper Riverina Dry Sclerophyll Forests >70% <90%	269, 285, 298, 304, 338, 353, 1094, 1095, 3535, 3540, 4152	9	2.25	0.08%
322	Inland Scribbly Gum - Red Stringybark - Black Cypress Pine hillslope shrub-tussock grass open forest	-	Western Slopes Dry Sclerophyll Forests <50%	54, 110, 179, 217, 243, 255, 270, 273, 287, 291, 309, 321, 322, 323, 324, 325, 327, 330, 331, 333, 341, 343, 346, 348, 354, 358, 379, 387, 396, 398, 399, 401, 402, 403, 404, 405, 406, 408, 409, 414, 415, 417, 419, 420, 423, 425, 430, 431, 440, 443, 449, 455, 456, 459, 462, 463, 467, 468, 469, 470, 471, 472, 473, 476, 477, 479, 480, 482, 515, 531, 532, 576, 577, 581, 592, 610, 617, 671, 673, 676, 712, 713, 714, 746, 863, 889, 940, 956, 1133, 1176, 1277, 1278, 1279, 1307, 1313, 1314, 1316, 1381, 1398, 1610, 1629, 1654, 1655, 1656, 1657, 1660, 1661, 1663, 1668, 1669, 1671, 1672, 1674, 1676, 1677, 1678, 1679, 1680, 1709, 1711, 1770, 1771, 3753, 3754, 3756, 3757, 3758, 3759, 3760, 3761, 3762, 3763, 3766, 3767, 3768, 3769, 3770, 3771, 3772, 3773, 3774, 3775, 3776, 3777, 3778, 3780, 3781, 3782, 3783, 3784, 3785, 3786, 4153	14	3.5	0.13%
287	Long-leaved Box - Red Box - Red Stringybark mixed open forest		Western Slopes Dry Sclerophyll Forests >50%<70%	54, 110, 217, 255, 273, 287, 330, 333, 341, 343, 346, 348, 358, 403, 455, 456, 472, 577, 581, 592, 617, 673, 676, 713, 940, 956, 1277, 1279, 1313, 1316, 1381, 1610, 1661, 1668, 1709, 3753, 3754, 3756, 3768, 3769, 4153	37	9.25	0.34%

PCT	PCT name	Corresponding TEC	OTG	OTG – Can Trade with these PCT's	Credits Required by OTG (approx.)	Approximate Area (ha) of offset site required by OTG ²⁵	% of HumeLink Ecosystem Credit Offset Liability
343	Mugga Ironbark - Red Box - Red Stringybark - Western Grey Box grass/shrub woodland on metamorphic substrates in the Tarcutta - Gundagai region	-	Western Slopes Dry Sclerophyll Forests >70% <90%	54, 110, 333, 341, 343, 358, 472, 1279, 1668	51	12.75	0.46%
316	Norton's Box - Red Box - Red Stringybark +/- Nodding Flax Lily forb-grass open forest	-	Western Slopes Grassy Woodlands >50%<70%	201, 202, 266, 267, 268, 272, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 286, 301, 316, 326, 337, 347, 383, 421, 426, 433, 434, 437, 441, 461, 483, 509, 516, 544, 589, 590, 593, 599, 847, 955, 1303, 1305, 1315, 1329, 1383, 1401, 1609, 1693, 1695, 3387, 3388, 3394, 3395, 3396, 3397, 3398, 3399, 3401, 3403, 3404, 3405, 3406, 3485, 4147	292	73	2.65%
301	Drooping Sheoke - Ricinocarpus bowmannii - grasstree tall open shrubland of the Coolac - Tumut Serpentine Belt	Coolac-Tumut Serpentine Shrubby Woodland	Western Slopes Grassy Woodlands >70% <90%	201, 202, 266, 267, 274, 275, 276, 277, 278, 280, 282, 283, 286, 301, 337, 383, 426, 433, 437, 441, 444, 483, 509, 516, 589, 590, 593, 599, 847, 955, 1303, 1304, 1315, 1329, 1383, 1695, 3387, 3394, 3395, 3396, 3397, 3398, 3399, 3404, 3405, 3406, 3485, 4147	28	7	0.25%
266	White Box grassy woodland	White Box Yellow Box Blakely's Red Gum Woodland	White Box Yellow Box Blakely's Red Gum Woodland	74, 75, 83, 250, 266, 267, 268, 270, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 286, 298, 302, 312, 341, 342, 347, 350, 352, 356, 367, 381, 382, 395, 401, 403, 421, 433, 434, 435, 436, 437, 451, 483, 484, 488, 492, 496, 508, 509, 510, 511, 516, 528, 538, 544, 563, 567, 571, 589, 590, 597, 599, 618, 619, 622, 633, 654, 702, 703, 704, 705, 710, 711, 796, 797, 799, 840, 847, 851, 921, 1099, 1103, 1303, 1304, 1307, 1324, 1329, 1330, 1331, 1332,	4917	1229.25	44.68%
268	White Box - Blakely's Red Gum - Long-leaved Box - Norton's Box - Red Stringybark grass-shrub woodland on shallow soils on hills	White Box Yellow Box Blakely's Red Gum Woodland	White Box Yellow Box Blakely's Red Gum Woodland				
277	Blakely's Red Gum - Yellow Box grassy tall woodland	White Box Yellow Box Blakely's Red Gum Woodland	White Box Yellow Box Blakely's Red Gum Woodland				
278	Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest	White Box Yellow Box Blakely's Red Gum Woodland	White Box Yellow Box Blakely's Red Gum Woodland				

PCT	PCT name	Corresponding TEC	OTG	OTG – Can Trade with these PCT's	Credits Required by OTG (approx.)	Approximate Area (ha) of offset site required by OTG ²⁵	% of HumeLink Ecosystem Credit Offset Liability
280	Red Stringybark - Blakely's Red Gum +/- Long-leaved Box shrub/grass hill woodland	White Box Yellow Box Blakely's Red Gum Woodland	White Box Yellow Box Blakely's Red Gum Woodland	1333, 1334, 1383, 1401, 1512, 1606, 1608, 1611, 1691, 1693, 1695, 1698, 3314, 3359, 3363, 3373, 3376, 3387, 3388, 3394, 3395, 3396, 3397, 3398, 3399, 3406, 3415, 3533, 4147, 4149, 4150,			
283	Apple Box - Blakely's Red Gum moist valley and footslopes grass-forb open forest	White Box Yellow Box Blakely's Red Gum Woodland	White Box Yellow Box Blakely's Red Gum Woodland				
352	Red Stringybark - Blakely's Red Gum hillslope open forest on meta-sediments in the Yass - Boorowa - Crookwell region	White Box Yellow Box Blakely's Red Gum Woodland	White Box Yellow Box Blakely's Red Gum Woodland				
1330	Yellow Box - Blakely's Red Gum grassy woodland on the tablelands	White Box Yellow Box Blakely's Red Gum Woodland	White Box Yellow Box Blakely's Red Gum Woodland				

Species Credits

The BDAR for the project identified that 95 species credit species may require offsetting with a total of around 600,000 species credits.

Table 7 presents the current analysis of the species credit requirement for the project and cost via the BCT price estimate. Subject to changes that may occur in the project footprint, and any changes that may occur within the NSW BOS or NSW BAM prior to sourcing species credits, this analysis should be undertaken again at that time.

Subject to the final agreed offset delivery approach for HumeLink, the distribution of the species credit species should inform the location from which species credits may be sourced. Synergies will exist where the distribution of species credits overlap. At these locations Transgrid may seek to acquire landholdings with the relevant values or enter into a form of credit supply agreement with landholders in those locations, especially in the case where sites might retain both ecosystem and species credit values. This information is currently held within Niche’s BOE for use in the execution phase of the offsets delivery program.

Table 7: Current (August 2023) assessment of Species Credit offset liability (not factoring in additional 20% credit liability due to increased clearing requirements)

Scientific Name	Number of credits required (from BDAR) (August)	\$/credit (BCT estimate (May))	Total price
<i>Callocephalon fimbriatum</i>	7,013	\$3,220	\$22,581,860
<i>Ninox strenua</i>	5,105	\$4,300	\$21,951,500
<i>Pseudomys fumeus</i>	4,229	\$4,300	\$18,184,700
<i>Caladenia concolor</i>	1,352	\$12,890	\$17,427,280
<i>Ninox connivens</i>	3,977	\$4,300	\$17,101,100
<i>Tyto novaehollandiae</i>	3,660	\$4,300	\$15,738,000
<i>Euphrasia arguta</i>	1,518	\$8,590	\$13,039,620
<i>Hieraetus morphnoides</i>	6,829	\$1,610	\$10,994,690
<i>Petroica rodinogaster</i>	4,627	\$2,150	\$9,948,050
<i>Prasophyllum sp. Wybong</i>	1,574	\$6,148	\$9,676,952
<i>Keyacris scurra</i>	2,887	\$3,220	\$9,296,140
<i>Ireneparsus magicus</i>	654	\$12,890	\$8,430,060
<i>Delma impar</i>	1,791	\$4,300	\$7,701,300
<i>Swainsona recta</i>	1,567	\$4,600	\$7,208,200
<i>Caladenia tessellata</i>	550	\$12,890	\$7,089,500
<i>Pseudophryne corroborree</i>	625	\$9,670	\$6,043,750
<i>Prasophyllum bagoense</i>	959	\$6,148	\$5,896,354
<i>Prasophyllum keltonii</i>	943	\$6,148	\$5,797,979
<i>Pterostylis foliata</i>	642	\$8,590	\$5,514,780
<i>Calyptorhynchus lathami</i>	1,694	\$3,220	\$5,454,680
<i>Phascolarctos cinereus</i>	9,531	\$540	\$5,146,740
<i>Cercartetus nanus</i>	4,368	\$1,070	\$4,673,760
<i>Zieria obcordata</i>	1,025	\$4,300	\$4,407,500

Scientific Name	Number of credits required (from BDAR) (August)	\$/credit (BCT estimate (May))	Total price
<i>Polytelis swainsonii</i>	1,287	\$3,220	\$4,144,140
<i>Lepidium hyssopifolium</i>	480	\$8,590	\$4,123,200
<i>Pterostylis alpina</i>	464	\$8,590	\$3,985,760
<i>Thesium australe</i>	1,209	\$3,220	\$3,892,980
<i>Swainsona sericea</i>	2,337	\$1,610	\$3,762,570
<i>Leucochrysum albicans</i> var. <i>tricolor</i>	34,196	\$110	\$3,761,560
<i>Grevillea wilkinsonii</i>	568	\$6,440	\$3,657,920
<i>Mixophyes balbus</i>	421	\$8,492	\$3,575,284
<i>Lophoictinia isura</i>	2,169	\$1,610	\$3,492,090
<i>Genoplesium superbum</i>	237	\$12,890	\$3,054,930
<i>Aprasia parapulchella</i>	1,867	\$1,610	\$3,005,870
<i>Cullen parvum</i>	916	\$3,220	\$2,949,520
<i>Prasophyllum petilum</i>	454	\$6,440	\$2,923,760
<i>Diuris aequalis</i>	647	\$4,300	\$2,782,100
<i>Cyclodomorphus praealtus</i>	259	\$9,670	\$2,504,530
<i>Petaurus norfolcensis</i>	4,027	\$540	\$2,174,580
<i>Pomaderris cotoneaster</i>	215	\$8,590	\$1,846,850
<i>Tyto tenebricosa</i>	511	\$3,220	\$1,645,420
<i>Phascogale tapoatafa</i>	2,870	\$540	\$1,549,800
<i>Bossiaea fragrans</i>	175	\$8,590	\$1,503,250
<i>Petauroides volans</i>	2,568	\$540	\$1,386,720
<i>Acacia flocktoniae</i>	309	\$4,300	\$1,328,700
<i>Burhinus grallarius</i>	1,222	\$1,070	\$1,307,540
<i>Petaurus norfolcensis</i> - endangered population	1,026	\$1,070	\$1,097,820
<i>Pomaderris delicata</i>	225	\$4,300	\$967,500
<i>Kunzea cabbagei</i>	220	\$4,300	\$946,000
<i>Calotis glandulosa</i>	441	\$1,610	\$710,010
<i>Petaurus australis</i> - endangered population	311	\$2,150	\$668,650
<i>Acacia ausfeldii</i>	383	\$1,610	\$616,630
<i>Haliaeetus leucogaster</i>	333	\$1,610	\$536,130
<i>Synemon plana</i>	238	\$2,150	\$511,700
<i>Phyllota humifusa</i>	212	\$2,150	\$455,800
<i>Petrogale penicillata</i>	43	\$9,670	\$415,810
<i>Litoria castanea</i>	61	\$6,440	\$392,840
<i>Pultenaea humilis</i>	114	\$3,220	\$367,080
<i>Chalinolobus dwyeri</i>	316	\$1,070	\$338,120
<i>Euphrasia scabra</i>	52	\$6,440	\$334,880
<i>Myotis macropus</i>	302	\$1,070	\$323,140
<i>Mastacomys fuscus</i>	50	\$6,440	\$322,000
<i>Acacia bynoeana</i>	89	\$3,220	\$286,580

Scientific Name	Number of credits required (from BDAR) (August)	\$/credit (BCT estimate (May))	Total price
<i>Ammobium craspedioides</i>	2,294	\$110	\$252,340
<i>Diuris ochroma</i>	16	\$12,890	\$206,240
<i>Glycine latrobeana</i>	16	\$12,890	\$206,240
<i>Bossiaea oligosperma</i>	41	\$4,300	\$176,300
<i>Crinia sloanei</i>	27	\$6,440	\$173,880
<i>Persoonia mollis subsp. revoluta</i>	151	\$1,070	\$161,570
<i>Rutidosia leiolepis</i>	700	\$210	\$147,000
<i>Baloskion longipes</i>	40	\$3,220	\$128,800
<i>Pterostylis oreophila</i>	19	\$6,148	\$116,820
<i>Prasophyllum innubum</i>	16	\$6,148	\$98,375
<i>Thelymitra alpicola</i>	11	\$8,590	\$94,490
<i>Pomaderris pallida</i>	40	\$2,150	\$86,000
<i>Xerochrysum palustre</i>	30	\$2,150	\$64,500
<i>Diuris tricolor</i>	12	\$4,300	\$51,600
<i>Miniopterus oriana oceanensis</i>	4	\$12,890	\$51,560
<i>Solanum armourense</i>	21	\$2,150	\$45,150
<i>Caesia parviflora var. minor</i>	7	\$6,440	\$45,080
<i>Persoonia marginata</i>	20	\$2,150	\$43,000
<i>Dillwynia glaucula</i>	61	\$540	\$32,940
<i>Calotis pubescens</i>	11	\$2,150	\$23,650
<i>Grevillea iaspicula</i>	27	\$860	\$23,220
<i>Eucalyptus macarthurii</i>	36	\$540	\$19,440
<i>Senecio garlandii</i>	13	\$1,070	\$13,910
<i>Commersonia prostrata</i>	3	\$4,300	\$12,900
<i>Eucalyptus robertsonii subsp. hemisphaerica</i>	3	\$2,150	\$6,450
<i>Acacia phasmoides</i>	6	\$860	\$5,160
<i>Eucalyptus alligatrix subsp. alligatrix</i>	3	\$860	\$2,580
<i>Eucalyptus cannonii</i>	2	\$540	\$1,080
<i>Eucalyptus aggregata</i>	4	\$210	\$840
Total	134,578		315,245,374

Existing species credits

The BDAR for the project includes a preliminary assessment of the availability of species credits at existing offset sites that could be used to satisfy the projects offset obligation for species credit species.

It notes that following a review of public registers there is limited supply of species credits within current stewardship sites.

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Central Coast
Gold Coast
Canberra

Our services

Ecology and biodiversity

Terrestrial
Freshwater
Marine and coastal
Research and monitoring
Wildlife Schools and training

Heritage management

Aboriginal heritage
Historical heritage
Conservation management
Community consultation
Archaeological, built and landscape values

Environmental management and approvals

Impact assessments
Development and activity approvals
Rehabilitation
Stakeholder consultation and facilitation
Project management

Environmental offsetting

Offset strategy and assessment (NSW, QLD, Commonwealth)
Accredited BAM assessors (NSW)
Biodiversity Stewardship Site Agreements (NSW)
Offset site establishment and management
Offset brokerage
Advanced Offset establishment (OJD)

