

Biodiversity Offset Delivery Plan Implementation Report 2022/2023

15-Mar-2024
Western Sydney International (Nancy-Bird Walton) Airport

Biodiversity Offset Delivery Plan Implementation Report 2022/2023

Client: Department of Infrastructure, Transport, Regional Development, Communications and the Arts

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Table of Contents

Executive Summary	i
1.0 Introduction	1
1.1 Reference documentation	1
1.2 Overview of offset requirements	3
1.3 Biodiversity credit terminology	3
1.4 Summary of the quantum of secured offsets prior to reporting period	4
1.5 Overview of current outstanding offsets	6
2.0 Implementation activities undertaken in the 2023 reporting period	6
2.1 Report scope	7
2.2 Independent audit	7
2.3 Direct biodiversity offset actions	7
2.3.1 NSW Biodiversity Offset Scheme	7
2.3.2 Defence Establishment Orchard Hills	8
2.4 Other compensatory measures	14
2.4.1 Threatened Flora Propagation Program (TFPP)	14
3.0 Conclusion	15
3.1 Outstanding offsets	15
3.2 Anticipated 2023-24 BODP reporting period activities	15
4.0 References	17
Appendix A	
Revised Statement of Assessment of Reasonable Equivalence of biodiversity credits	A

Executive Summary

The Western Sydney International Airport Plan (Airport Plan)¹ provides the authorisation for Stage 1 of the airport under the *Airports Act 1996* (Cth) and includes a number of environmental conditions that the Department of Infrastructure, Transport, Regional Development, Communications and the Arts (Infrastructure) must comply with. Under condition 30 of the Airport Plan, Infrastructure was required to prepare and submit a Biodiversity Offset Delivery Plan (BODP) for approval to compensate for residual significant biodiversity impacts associated with construction of Stage 1 of the development.

Infrastructure is required, in accordance with condition 47(3) of the Airport Plan to report to the Environment Department every 12 months on the implementation of the BODP, until all biodiversity offsets under the BODP have been secured or implemented.

The purpose of this report is to describe the BODP implementation activities that have occurred in the 2022-23 reporting period (25 August 2022 to 24 August 2023) (the reporting period).

During the reporting period Infrastructure undertook the following implementation activities:

- Purchasing offset credits under the NSW Biodiversity Offset Scheme (BOS), including:
 - River Flat Eucalypt Forest (HN526/PCT 835): 135 HN526 credits
 - Freshwater wetland (HN630/PCT 1071): 12 HN630 credits
 - Dillwynia tenuifolia*: 102 credits
 - Southern Myotis (*Myotis macropus*): 400 credits.
- Through these purchases, the outstanding offset obligations for *Dillwynia tenuifolia* and Southern Myotis have been secured.
- Specialist offset management contractor activities at DEOH, including familiarisation activities and baseline surveys of the site, management actions set out in the Department of Defence Orchard Hills Offset Area Offset Plan, June 2022 (DEOH Offset Plan), and the establishment of monitoring and research programs.
- Continuation of the Stage 2 operations of the Australian Botanic Gardens Mount Annan Threatened Flora Propagation Program (ABGMA TFPP).

Table ES-1 outlines the outstanding credit obligations to be considered in the next reporting period (2023 - 24).

Table ES-1 Outstanding biodiversity credit requirements following the 2022-23 reporting period

Credit type	Original credits liability (BioBanking Assessment Methodology (BBAM))	Equivalent Biodiversity Assessment Method (BAM) credit liability	Credits Secured in 2022-23	Outstanding credit liability (BBAM)	Outstanding credit liability (BAM)
Ecosystem credits					
River Flat Eucalypt Forest (HN526/PCT 835)	2,661	n/a ⁽¹⁾	135 (BAM)	293	293
Freshwater wetland (HN630/PCT 1071)	926	545	12 (BBAM)	869	511

¹ As approved in 2016 (Commonwealth of Australia 2016) and varied in 2020 and 2021

Credit type	Original credits liability (BioBanking Assessment Methodology (BBAM))	Equivalent Biodiversity Assessment Method (BAM) credit liability	Credits Secured in 2022-23	Outstanding credit liability (BBAM)	Outstanding credit liability (BAM)
Species credits					
Spiked Rice flower <i>Pimelea spicata</i>	107,068	53	-	107,068	53
<i>Dillwynia tenuifolia</i>	540	n/a ⁽¹⁾	102 (BAM)	0	0
Southern Myotis <i>Myotis macropus</i>	1,617	1,617	400 (BAM)	0	0

¹ An assessment of reasonable equivalence for the original credit liability was not undertaken, and an equivalent BAM credit liability is not expressed for this value. Appendix A provides a revised statement of reasonable equivalence for the outstanding credit liability as at 24 August 2022, and notes that matching credits are available on the BioBanking Credits register for these credits types.

Actions in the 2024 reporting period are anticipated to include further investigation of the availability of biodiversity credits, and exploring alternative offset options where availability is limited. The outcome and detail of these investigations and any offset credit purchases will be detailed in the 2024 BODP Implementation Report.

As per condition 30(11) of the Airport Plan, an independent audit for the August 2022 to February 2024 period will be undertaken by Infrastructure in 2024. The audit report will be submitted to the Department of Climate Change, Energy, the Environment and Water (the Environment Department) by 31 August 2024.

Under condition 30(14) of the Airport Plan, Infrastructure must review the BODP every five years until all biodiversity offsets required by the plan have been secured or implemented, to ensure that the BODP continues to meet the approval criteria for that plan. The five-year BODP review will be completed during the 2024 reporting period, and a report will be provided to the Environment Minister.

1.0 Introduction

The Western Sydney International (Nancy-Bird Walton) Airport (WSI) is currently under construction at Badgerys Creek, NSW. Stage 1 of the airport includes a 3.7 kilometre runway, an integrated domestic and international terminal, and initial capacity for 10 million passengers annually.

The WSI Airport Plan (Airport Plan) (as approved in 2016 and varied in 2020 and 2021) provides the authorisation for Stage 1 of the airport under the *Airports Act 1996* (Cth) and includes a number of environmental conditions to mitigate biodiversity impacts. Condition 30 requires Infrastructure to prepare and submit a Biodiversity Offset Delivery Plan (BODP) for approval. This plan must outline how the project intends to compensate for residual significant impacts associated with Stage 1 of the development, specifically via offsetting impacts on threatened species and communities listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), and threatened plants, animals and their habitat listed under the New South Wales *Biodiversity Conservation Act 2017* (BC Act).

Under condition 47(3)² of the Airport Plan, Infrastructure is required to report to the Environment Department annually on the implementation of the BODP until all biodiversity offsets (including other compensatory measures) have been secured or implemented. The purpose of this report is to provide an update on the implementation activities associated with the BODP undertaken in the 2022-2023 reporting period (25 August 2022 to 24 August 2023).

As such, this report includes the following detail for the 2022-2023 reporting period:

- A description of activities undertaken to identify, secure and quantify direct offsets.
- A description of the other compensatory measures that have been delivered and steps taken to identify alternative measures.

Figure 1 shows locations where offsets have been investigated and/or secured, including direct offsets and other compensatory measures, within this reporting period.

1.1 Reference documentation

Given the volume of previous reporting and publicly available information, this report does not provide extensive background information on the development and approval of the BODP, offset requirements, and implementation activities in previous periods. This information can be sourced in relevant reference documentation, available on the WSI website, www.westernsydneyairport.gov.au. Relevant reports available on the WSI website at the time of publishing include:

- Western Sydney Airport Environmental Impact Statement (EIS) 2016, Appendix K2 – Offset Strategy³
- Western Sydney Airport Plan, as approved in 2016 and varied in 2020 and 2021⁴
- BODP (Department of Infrastructure and Regional Development 2018), as approved 24 August 2018⁵
- BODP Implementation Reports⁶:
 - 2019: Reporting period 25 August 2018 to 25 August 2019 (GHD 2020)
 - 2020: Reporting period 25 August 2019 to 25 August 2020 (GHD 2021)
 - 2021: Reporting period 25 August 2020 to 24 August 2021 (AECOM 2023a)
 - 2022: Reporting period 25 August 2021 to 24 August 2022 (AECOM 2023b)
- DEOH Offset Plan⁷ (GHD 2022).

² This was previously condition 39(3) under the 2016 and 2020 Airport Plans, varied to condition 47(3) in September 2021

³ <https://www.westernsydneyairport.gov.au/sites/default/files/WSA-EIS-Volume-4-Appendix-K2-Offset-strategy.pdf>

⁴ <https://www.westernsydneyairport.gov.au/about/airport-plan>

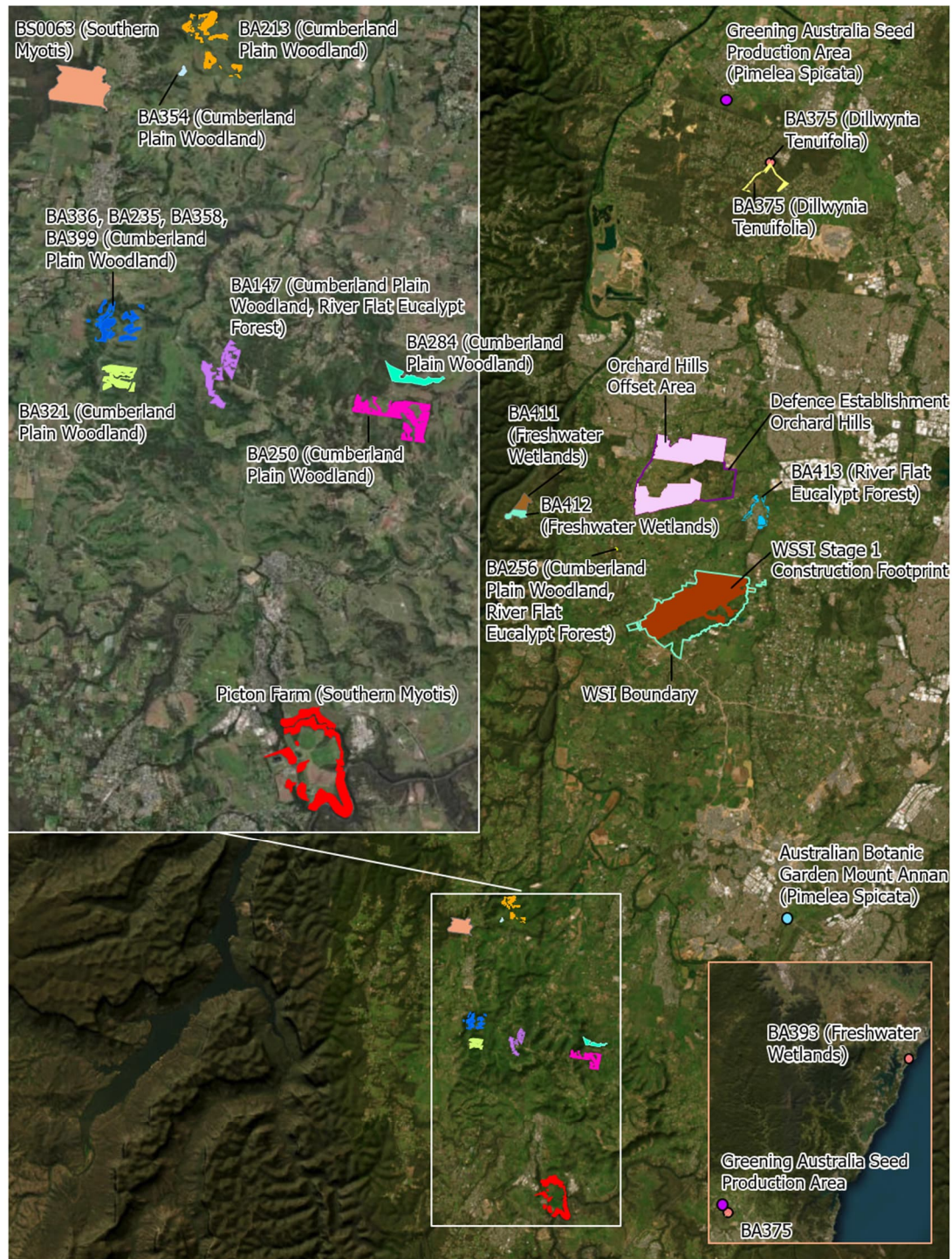
⁵ <https://www.westernsydneyairport.gov.au/environment-heritage/environment/biodiversity-offset-delivery-plan>

⁶ <https://www.westernsydneyairport.gov.au/environment-heritage/environment/biodiversity-offset-delivery-plan>

⁷ <https://www.westernsydneyairport.gov.au/sites/default/files/documents/defence-orchard-hills-offset-area-offset-plan.pdf>

This report (2022-2023 reporting period) is required to be published on Infrastructure's public-facing website as per condition 47(3) of the Airport Plan.

Figure 1 BODP Implementation offset area



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1.2 Overview of offset requirements

Biodiversity values identified in the BODP as requiring offsetting as a result of Stage 1 of the Development are summarised in **Table 1**.

Table 1 Biodiversity offset obligations for Stage 1 of the Project

Threatened species and ecological communities	
EPBC Act (Cth)	
<ul style="list-style-type: none"> Habitat for the vulnerable Grey-headed Flying fox (<i>Pteropus poliocephalus</i>) (187.8 hectares (ha)) Potential winter foraging habitat for the critically endangered Swift Parrot (<i>Lathamus discolor</i>) (187.8 ha) Habitat for the endangered Spiked Rice-flower (<i>Pimelea spicata</i>) (4,118 clumps over 2.94 ha) Critically endangered ecological community: Cumberland Plain Shale Woodland and Shale-Gravel Transition Forest (141 ha). 	
BC Act (NSW)	
Ecosystem-credit offsets: <ul style="list-style-type: none"> Grey Box – Forest Red Gum Grassy Woodland on flats in varying condition (224.1 ha) Grey Box – Forest Red Gum Grassy Woodland on shale in varying condition (48.7 ha) Forest Red Gum – Rough-barked Apple Grassy Woodland in varying condition (referred to as River Flat Eucalypt Forest in this report) (47.6 ha) Broad-leaved Ironbark – Grey Box – (<i>Melaleuca decora</i>) grassy open forest in varying condition (5.9 ha) Good condition artificial freshwater wetland on floodplain (32.7 ha). 	Species-credit offsets: <ul style="list-style-type: none"> Cumberland Land Snail (<i>Meridolum corneovirens</i>) 183.2 ha of habitat <i>Dillwynia tenuifolia</i> (30 individuals) <i>Marsdenia viridiflora</i> subsp. <i>viridiflora</i> (145 individual stems) <i>Pultenaea parviflora</i> (4 individuals) Southern Myotis (<i>Myotis macropus</i>) roosting habitat (71.7 ha of habitat) Spiked Rice-flower (<i>Pimelea spicata</i>) (4,118 clumps over 2.94 ha of habitat).

In accordance with the EPBC Act Environmental Offsets Policy (DSEWPaC, 2012), a minimum of 90% of required offsets are required to be 'direct offsets', providing a measurable conservation gain in direct response to the impact upon a protected matter. This includes securing management and conservation of equivalent sites, securing of biodiversity credits from existing sites, and acquisition of suitable land. The remaining 10% of the offsets can be delivered through 'other compensatory measures', which include indirect actions aimed at benefiting the impacted protected matter, such as the provision of funding for research or educational programs.

1.3 Biodiversity credit terminology

The NSW Biodiversity Offsets Scheme (BOS) relies on the Biodiversity Assessment Method (BAM) under the BC Act to consistently assess impacts on biodiversity values from proposed developments, as well as improvements in biodiversity values from management actions undertaken at biodiversity stewardship sites. Prior to the BC Act commencing in August 2017, the NSW Framework for Biodiversity Assessment (FBA) relied on the BioBanking Assessment Methodology (BBAM), under the now repealed *Threatened Species Conservation Act 1995* (TSC Act), to consistently assess impacts and improvements on biodiversity values.

A 'Biodiversity credit' is the standard unit of measurement under both the former BioBanking scheme and the current BOS. Due to changes in the assessment process between BioBanking and the BOS, the same offset requirement can be expressed as a different number of credits depending on the scheme being referenced. A conversion of an offset requirement between schemes is termed an 'Assessment of Reasonable Equivalence' and is undertaken by the NSW Department of Planning and Environment (DPE) on behalf of the proponent. The output of this assessment is a Statement of Assessment of Reasonable Equivalence.

As outlined in the 2020 BODP Implementation Report (GHD 2021), the Environment Department has endorsed the project's offset requirement to be expressed in terms of 'biodiversity credits'. The original offset obligation for the project was calculated in accordance with the former FBA (the assessment

methodology previously adopted to quantify offsets for major NSW projects), utilising the BBAM. An Assessment of Reasonable Equivalence⁸ was undertaken for certain components of the project's offset requirements in February 2020 to convert credits to the current BOS scheme (BAM equivalent). A request for a revised Statement of Assessment of Reasonable Equivalence was submitted to DPE on 24 August 2022, and replaces the previous statement (dated 9 April 2020). The revised Statement of Assessment of Reasonable Equivalence (8 November 2022) is at **Appendix A**. The project's residual offset requirement, in biodiversity credits, is expressed herein as both:

- BioBanking (BBAM) credits for biodiversity values established under the TSC Act; and
- Biodiversity Assessment Method (BAM) credits for biodiversity values established under the BC Act, determined through an Assessment of Reasonable Equivalence.

Furthermore, both BBAM and BAM biodiversity credits can be expressed as either ecosystem or species credits. These are defined as:

- Ecosystem credit - The class of biodiversity credits created or required for the impact on:
 - endangered ecological communities (EECs);
 - critically endangered ecological communities (CEECs); or
 - threatened species habitat for species that can be reliably predicted to occur within a vegetation type.
- Species credit - The class of biodiversity credits created or required for the impact on threatened species that cannot be reliably predicted to use an area of land based on habitat surrogates. The number of species credits is calculated based on targeted surveys of that species.

1.4 Summary of the quantum of secured offsets prior to reporting period

BODP implementation reports were published for the 2018-19, 2019-20, 2020-21 and 2021-22 reporting periods (**Section 1.1**). The following section provides a brief summary of the offsets secured prior to the current reporting period. These credits form the baseline of the residual offset obligations discussed in this report.

A substantial portion of the direct offsets required for the development have been secured through the establishment of a conservation area at Defence Establishment Orchard Hills (DEOH). The DEOH Offset Area is managed through the implementation of the DEOH Offset Plan, under the framework of the approved BODP and a Memorandum of Understanding between the Department of Defence (Defence) and Infrastructure.

Other direct offsets have also been secured through the purchase of biodiversity credits generated by Biodiversity Stewardship Agreement (BSA) sites. Biodiversity credits generated through BSA sites have been transferred to Infrastructure upon purchase. Upon securing the full offset requirement, all biodiversity credits will be 'retired', fulfilling Infrastructure's offset in perpetuity.

The quantum of direct offsets secured to-date through the above methods is provided in **Table 2**. By the end of the 2022 reporting period the full offset obligation for five of the eleven credit types had not yet been satisfied. The type and quantum of the outstanding credit types is discussed in **Section 1.5**.

Other indirect offsets (i.e., other compensatory measures) have not been quantified to date. These measures, including the ABGMA TFPP and Greening Australia (GA) seed collection and production program, are discussed in **Section 2.4**. These programs have been funded by Infrastructure and details on their progress and operations are set out in this report.

⁸ Refer to 2019-2020 Implementation Report for details (Section 1.1)

Table 2 Quantum of biodiversity offsets secured over previous reporting periods (as of August 2022, the start of this reporting period). All values expressed as BBAM credits

Credit type	Credits required	Biodiversity credits generated at DEOH Offset Area ¹	Biodiversity credits previously secured at BSA sites				Secured credits available for retirement for the Development		
			2018-19	2019-20	2020-21	2021-22	Total credits	% of offset requirements	Offset obligation met?
Ecosystem credits									
Cumberland Plain Woodland (HN528 high, medium, poor and low condition and HN529 high and poor condition)	12,746	9,351	3,805	0	0	0	13,156	103%	Yes
River Flat Eucalypt Forest (HN526 high, poor and low condition)	2,661	1,979	254	0	0	0	2,233	84%	No
Shale-gravel Transition Forest (HN512 high and poor condition and HN513 high condition)	359	709	0	0	0	0	709	197%	Yes
Equivalent ecosystem credits for Grey-headed Flying-fox habitat and Swift Parrot foraging habitat	15,766	12,039	0	4,059	0	0	16,098	102%	Yes
Freshwater wetland (HN630)	926	41	0	4	0	0	45	5%	No
Species credits									
Spiked Rice-flower (<i>Pimelea spicata</i>)	107,068	0	0	0	0		107,068	0%	No
Cumberland Plain Land Snail (<i>Meridolum corneovirens</i>)	2,441	2,799	0	0	0	0	2,799	115%	Yes
<i>Dillwynia tenuifolia</i>	540	409	0	29	0	0	438	81%	No
<i>Marsdenia viridiflora</i> subsp. <i>viridiflora</i>	5,800	14,512	0	0	0	0	14,512	250%	Yes
<i>Pultenaea parviflora</i>	60	7,486	0	0	0	0	7,486	12,477%	Yes
Southern Myotis (<i>Myotis macropus</i>)	1,617	759	0	0	0	458	1,217	75.26%	No

(1) DEOH credits consistent with 2021 update, as updated to reflect addition of land to the Offset Area and discounting of credit generation rates for existing management obligations

1.5 Overview of current outstanding offsets

Progress towards securing the full quantum of required offsets under the BODP has been made during the previous reporting periods for most of the direct offsets required. The quantum of credits outstanding at the end of the 2022 reporting period has been compared to the original offset BODP obligation in order to calculate the obligation still outstanding at the commencement of the 2023 reporting period (**Table 3**).

As described in **Section 1.3**, the project's outstanding offset requirement has been expressed as both BBAM and BAM credits, based upon the revised Assessment of Reasonable Equivalence (November 2022) (**Appendix A**). The November 2022 Assessment of Reasonable Equivalence calculated the outstanding 881 BBAM credits for HN630/PCT 1071 as being equivalent to 518 BAM credits (reported as 519 BAM credits prior to receipt of the statement). This revised value has been incorporated into this report.

Throughout the remainder of this report the requirements for credits are expressed in both BBAM and BAM terms.

Table 3 Outstanding biodiversity credit requirements following the 2021-22 reporting period. Note that only credit types with outstanding credit requirements are shown.

Credit type	Total credits required (BBAM)	Total credits required (BAM)	Outstanding credits required (BBAM)	Outstanding credits required (BAM)
Ecosystem credits				
River Flat Eucalypt Forest (HN526/PCT 835)	2,661	n/a ⁽¹⁾	428	428
Freshwater wetland (HN630/PCT 1071)	926	545	881	518
Species credits				
Spiked Rice-flower (<i>Pimelea spicata</i>)	107,068	53	107,068	53
<i>Dillwynia tenuifolia</i>	540	n/a ⁽¹⁾	102	102
Southern Myotis (<i>Myotis macropus</i>)	1,617	1,617"	400	400

¹ An assessment of reasonable equivalence for the original credit liability was not undertaken, and an equivalent BAM credit liability is not expressed for this value. Appendix A provides a revised statement of reasonable equivalence for the outstanding credit liability as at 24 August 2022, and notes that matching credits are available on the BioBanking Credits register for these credits types.

2.0 Implementation activities undertaken in the 2023 reporting period

2.1 Report scope

This report covers activities in the 2023 reporting period, between 25 August 2022 and 24 August 2023. The following sections of this report provide a description of:

- An independent audit carried out in relation to the implementation of the BODP (**Section 2.2**)
- Activities undertaken to identify, secure and quantify direct offsets (**Section 2.2**)
- Other compensatory measures that have been delivered and steps taken to identify additional measures (**Section 2.4**).

2.2 Independent audit

Infrastructure is required to ensure that independent audits of BODP implementation are conducted every 18 months until all offset requirements of the BODP have been implemented, in accordance with Condition 30(11) of the Airport Plan for WSI.

During the 2023 reporting period, an independent auditor was engaged by Infrastructure to prepare an audit of the implementation of the BODP. The audit reviewed activities undertaken over an 18-month period, from February 2021 through to August 2022.

The audit found that condition 30(11)(b) of the Airport Plan, which requires Infrastructure to submit a report of each audit to the Environment Department within six months of the end of the audit period, had not been complied with for the previous audit. The audit determined that all other requirements had been complied with or were otherwise not applicable.

The next independent audit will be carried out for the August 2022 to February 2024 period.

2.3 Direct biodiversity offset actions

The following is a summary of direct offset actions undertaken by Infrastructure involving the identification and securing of biodiversity credits through BSA sites.

Biodiversity credits are categorised below as ecosystem credits and species credits, as identified in **Table 2**.

2.3.1 NSW Biodiversity Offset Scheme

2.3.1.1 Identification of available credits

The *Western Sydney Airport Biodiversity offset options report* (Biosis, 2022) was prepared to identify available biodiversity credits that may be suitable as direct offsets for the project. This report has been used to support the ongoing investigations and activities to secure remaining offsets for the project. The report focused on the two types of ecosystem credits and three types of species credits for which there remained an offset obligation at the commencement of the 2022 reporting period. The report considered the suitability of each option, referencing like-for-like matches in accordance with the BOS/FBA, and direct offsets in accordance with the EPBC Act Offsets Policy. The report also provided an assessment of options against the BODP offset criteria.

In August 2022, the type and quantum of outstanding credits required by Infrastructure were published on the BOS Demand Register. As part of this process, Infrastructure commenced an Expression of Interest (EOI) process to identify credits available for purchase. Credit holders who had previously indicated interest were contacted and advised to respond via the Demand Register. The EOI process closed in October 2022, and a Request for Tender (RFT) was issued to interested parties that met EOI requirements. The outcome of the RFT is discussed in the sections below.

2.3.1.2 Ecosystem credits

The following ecosystem credits were secured in this period through the EOI and selected RFT process detailed in **Section 2.3.1.1**:

- River Flat Eucalypt Forest: 135 credits purchased (BioBanking Agreement – BA413)
- Freshwater Wetland: 12 credits purchased (BioBanking Agreements – BA411 (9 credits) and BA412 (3 credits))

Infrastructure is continuing to engage with River Flat Eucalypt Forest credit holders identified through the RFT process, and is undertaking procurement activities which are likely to secure the outstanding obligation for this credit type. Further updates on these ongoing procurement activities will be provided in future implementation reports.

During the reporting period, Infrastructure continued to identify options to secure the outstanding credit obligation for Freshwater Wetland (HN630/ PCT 1071). This included engaging with the NSW BCT Credits Supply Taskforce and the Environment Department. Infrastructure also prepared a paper to understand and quantify the value of alternative offset options, as well as any divergences from the EPBC Act offset policy.

2.3.1.3 Species credits

The following species credits were secured in this period through the EOI and selected RFT process detailed in **Section 2.3.1.1**:

- *Dillwynia tenuifolia*: 102 credits purchased (BA375)
- Southern Myotis: 400 credits purchased (Biodiversity Stewardship Agreement BS0063).

Through these purchases, the outstanding offset obligations for *Dillwynia tenuifolia* and Southern Myotis have been fully satisfied.

An outstanding credit obligation remains for *Pimelea spicata*. The following provides a summary of activities undertaken to identify and secure *Pimelea spicata* credits during the reporting period.

In August 2022, Elizabeth Norris, an NSW DPE nominated Qualified Expert on *Pimelea spicata* was engaged to determine the suitability of the Orchard Hills Offset Area, located within DEOH, for offsetting the impacts to *Pimelea spicata*. A desktop assessment and field surveys at DEOH were undertaken by the Qualified Expert during the previous reporting period.

During the current reporting period, the Qualified Expert completed an expert report on this matter. This report confirmed the presence of potential *Pimelea spicata* habitat at DEOH.

In November 2022, the DEOH specialist offset management contractor, Greater Sydney Local Land Services (GS LLS), further confirmed a population of approximately 159 stems of *Pimelea spicata* within the Northern Buffer Area of DEOH. Through GS LLS activities, an additional 17 plants were confirmed in April/May 2023 and a further population of 42 stems were confirmed in May 2023.

The potential for an offset for *Pimelea spicata* at DEOH, based on confirmed presence of the species and mapped habitat, will be quantified during the 2024 reporting period and discussed with the Environment Department.

2.3.2 Defence Establishment Orchard Hills

A substantial portion of the direct offsets required for the airport development have been secured through undertaking conservation and restoration activities at DEOH. Defence has set aside a 978.83 ha Offset Area at DEOH for this purpose. This Offset Area comprises 938.48 ha of managed vegetation and 40.35 ha of supporting land uses such as tracks and easements. These arrangements have been formalised through a Memorandum of Understanding between Defence and Infrastructure and will be managed under the DEOH Offset Plan to improve the quality of habitat for affected threatened biota and plants over a period of 20 years, until 2038, with ongoing maintenance thereafter.

GS LLS has been engaged by Defence as the specialist offset management contractor for the DEOH Offset Area since July 2022. During the reporting period, GS LLS has undertaken familiarisation activities and baseline surveys of the site, undertaken management actions set out in the DEOH Offset Plan, and established monitoring and research programs. These are discussed further below.

2.3.2.1 Familiarisation and baseline surveys

GS LLS completed baseline data and validation surveys during the reporting period, resulting in a considerable expansion of threatened species knowledge for the DEOH site. This included the discovery of previously unknown populations of Platypus, Speckled Warbler and *Pimelea spicata*. This work, and the additional knowledge acquired, will be considered during the 2024 reporting period to understand whether refinements within the DEOH Offset Plan would further improve restoration outcomes and better contribute to meeting offset objectives.

2.3.2.2 Management activities

The DEOH Offset Plan requires that management actions be performed across the Offset Area to achieve the Offset Plan objectives, with a particular focus on the required increase in the site quality score of habitat for threatened biota affected by development of Stage 1 of WSI. Specific management actions in this regard are outlined in the DEOH Offset Plan, and are typically linked to either documentation or on-ground activities. These include actions specific to certain habitat types (e.g., installation of habitat resources in woodland; revegetation of derived grasslands) and those that can be applied to alleviate broader threats or achieve restoration opportunities (e.g., management of fire for conservation, control of pest fauna).

Certain management actions relate to the development of strategies and mapping to meet the offset objectives. **Table 4** provides a summary of such documents completed by GS LLS during the reporting period, the corresponding DEOH Offset Plan Management Action ID and the intended management outcomes.

Table 4 Completed management action documentation

DEOH Offset Plan Management Action ID	Completed Management Action	Management Action Outcomes
1.1	Develop woodland and forest management strategy	Woodland and forest management strategy which includes verification of the baseline biodiversity values, vegetation zone mapping and approaches presented in the DEOH Offset Plan, and provides for definition and implementation of management techniques and performance targets.
1.2	Woodland and forest stand health mapping	Fine scale mapping of stand health, including tree species richness, dieback and diversity of stem size classes and definition of specific targets and management actions appropriate to each stand.
2.1	Develop regeneration and revegetation strategy	Regeneration and revegetation strategy which includes verification of the baseline biodiversity values and approaches presented in the DEOH Offset Plan, and provides for definition and implementation of management techniques and performance targets.
3.1	Develop habitat enhancement strategy	Habitat resource enhancement strategy which includes verification of the baseline biodiversity values and approaches presented in the DEOH Offset Plan and provides for definition and implementation of management techniques and performance targets.
4.1	Develop weed control strategy	Weed control strategy which includes verification of the baseline biodiversity values and approaches presented in the DEOH Offset Plan and provides for definition and implementation of management techniques and performance targets.

DEOH Offset Plan Management Action ID	Completed Management Action	Management Action Outcomes
5.1	Review DEOH Bushfire Risk Management Plan (BRMP) and develop supplementary ecological fire management strategy	Development of clear roles and responsibilities relating to fire management. Fire management cells and appropriate fire regimes identified. Contribution to risk assessment processes and development and implementation of the BRMP as required.
6.1	Develop fauna management strategy	Pest fauna and overabundant native fauna management strategy, integrated with existing programs and plans.
9.1	Develop soil and water quality management strategy	A soil and water quality management strategy which includes verification of the baseline biodiversity values and approaches presented in the DEOH Offset Plan and provides for definition of approach, erosion mitigation/remediation techniques and time and area bound work plans and targets.
9.2	Fine scale erosion mapping	Fine scale map of areas of existing or potential erosion and structures or mitigation measures for controlling erosion-related risks to regeneration and revegetation strategy and other DEOH Offset Objectives.

In addition to the preparation of the above documentation, GS LLS has completed on-ground activities aimed at achieving offset objectives. A summary of these activities undertaken during the reporting period, and their alignment with DEOH Offset Plan management actions is provided in **Table 5**.

Table 5 Summary of GS LLS management actions during the reporting period

ID	Management Action	Summary of GS LLS activities
1	Woodland and forest management	
1.3	<i>Develop and implement techniques to improve stand quality:</i> Identification and implementation of dieback treatments, stand thinning, other silvicultural techniques or other ecological restoration techniques to help meet performance targets.	<ul style="list-style-type: none"> GS LLS worked with Melbourne University to develop a research and monitoring program relevant to canopy health offset objectives, which is in place with baseline data collection underway. GS LLS worked with an Indigenous contractor to trial methods for safe tree felling/thinning in dense stands. Tree thinning provides for structural improvements to vegetation within the Cumberland Plain Woodland. Stand Quality improvements commenced, with early observations of native groundcover improvements noted in the reporting period.
2	Regeneration and revegetation	
2.2	<i>Targeted shrub and ground cover species richness planting:</i>	Seed collection is underway. These seeds will provide the basis for

ID	Management Action	Summary of GS LLS activities
	Definition of areas, appropriate species and cover targets to increase shrub and ground cover species richness.	revegetation activities aimed at improving species diversity, and structural complexity.
2.3	<i>Broad area over-storey/mid-storey planting:</i> Definition of areas, appropriate species and cover targets to increase over-storey and mid-storey cover.	
2.4	<i>Full structural revegetation:</i> Definition of areas, appropriate species and cover targets to achieve full structural revegetation resembling ecological communities in DEOH Offset Area.	
3	Habitat enhancement	
3.2	<i>Installation of supplementary habitat resources:</i> Installation of supplementary habitat resources, including hollows, nesting boxes, woody debris and other resources.	Approximately 7% of the woody debris target has been reached, sourced from: <ul style="list-style-type: none">• woody debris from local developments, stockpiled on site and awaiting biosecurity checks for deployment during the 2024 reporting period;• felled exotic trees on site; and• thinned native trees on site. 32 experimental nesting boxes have been installed, to encourage threatened microbats.
3.4	<i>Implement measures to improve aquatic habitat:</i> Identification of effective and ecologically appropriate actions to maximise aquatic habitat value.	Material has been sourced and stockpiled on site for installation of aquatic 'Habitat Hotels' in wetlands during the 2024 reporting period.
3.5	<i>Identify significant sources of light pollution and management actions to minimise their impact:</i> Undertake night-time inspections to determine significant sources of light pollution and their impact on habitat quality for nocturnal fauna.	First light pollution survey completed, and will be ongoing through the 2024 reporting period.
4	Weed control	
4.2	<i>Primary weed control followed by weed control rounds as required to achieve maintenance level:</i> Primary weed control of mapped weed infestations followed by control rounds as required to achieve <5% weed cover.	<ul style="list-style-type: none">• Exotic tallowwood and spotted gum trees professionally felled and recycled for woody debris.• Approximately 3,000 hours of primary weed control completed during the reporting period (Plate 1 and Plate 2).
4.4	<i>Supress weeds:</i> Reduced cover and extent of infestations.	Reduction in African Love Grass and recovery of native species, especially <i>Themeda triandra</i> .
5	Ecological fire management	
5.2	<i>Support the implementation of the DEOH Bushfire Risk Management Plan:</i> Facilitate the objectives of the DEOH BRMP including maintenance of access, fire breaks and signage.	<ul style="list-style-type: none">• Successful management burn in Northern Buffer Area in July 2023 to reduce fuel loads.• Extensive partnerships developed with local RFS and Fire and

ID	Management Action	Summary of GS LLS activities
		Rescue brigades who have undertaken coordinated burns on site.
5.3	<i>Implement the ecological fire management actions:</i> Maintenance of ecologically appropriate fire regimes in accordance with the BRMP and strategy developed.	<ul style="list-style-type: none"> New Aboriginal cultural and ecological burn partnership established Five cultural and ecological burns implemented in Northern Buffer Area.
6	Pest fauna and overabundant native fauna control	
6.2	<i>Maintain exclusion fencing around Offset Area:</i> Appropriate monitoring and maintenance regime developed and implemented for fencing around the Offset Area.	GS LLS is working with Defence to consider improvements to fencing around the Offset Area for the management of general biosecurity risks and pest fauna.
6.3	<i>Implement pest fauna controls:</i> Implementation to achieve planned targets with the overarching aim to eradicate pest fauna within the Offset Area in the first 10 years of the Offset Improvement Period.	Initial priority has been on Macropod control, with removal of fallow deer and foxes ongoing.
6.4	<i>Review and implement overabundant macropod controls:</i> Review existing kangaroo management plan and implement supplementary strategies and works plans as required to manage macropod populations such that Offset Objectives are not threatened.	Major control campaign to manage overabundant native herbivores completed, resulting in observed improvement to native groundcovers.
8	Contamination and human activities	
8.1	<i>Identify and report significant sources of contamination:</i> Report evidence of contamination to Defence with GPS coordinates.	The DEOH Offset Plan notes that there is a known risk of contamination sources both in the Offset Area and adjoining areas, including unexploded ordnance (UXO). Contamination review completed by GS LSS, with no actions presently required.
8.2	<i>Facilitate contamination remediation by Defence in Offset Area and adjoining areas:</i> All proposed ground-disturbing activities to be reported to Defence to allow appropriate clearance and remediation (if required) prior to the activity commencing.	
8.3	<i>Ensure appropriate quality of revegetation in remediation areas:</i> All remediation areas must be treated as management unit E – full structural revegetation.	
8.4	<i>Remove non-hazardous waste and dumped materials:</i> Remove obsolete fences, sources of asbestos, rubbish or other dumped materials from the Offset Area.	<ul style="list-style-type: none"> Waste removed with Aboriginal industry partner. Ongoing removal of fencing for offsite recycling. Removal and recycling of several copper chrome arsenic telegraph poles & fittings (two to be retained as bird perching). Ongoing removal of car tyres.



Plate 1 Before (left) and after (right) mixed herbaceous annuals control (Management Action 4.2: Weed Control)



Plate 2 Before (left) and after (right) mixed Lantana control (Management Action 4.2: Weed Control)

2.3.2.3 Monitoring program

The following provides a summary of monitoring activities undertaken by GS LLS during the reporting period:

- **NSW BAM monitoring:** BAM monitoring was completed across 84 plots in October and November 2022.
- **Threatened flora surveys:** Seasonal threatened flora surveys were undertaken in November 2022 and March 2023, improving knowledge of the threatened species and populations at DEOH.
- ***Pimelea spicata* monitoring:** This species is a new discovery at DEOH by GS LLS. GS LLS has established six fixed-line transects to monitor *Pimelea* health and distribution over time.
- **Native fauna monitoring:** GS LLS periodically deployed a network of 40 fauna monitoring cameras to monitor native fauna on the site.
- **Kangaroo and pest animal monitoring:** Extensive quantitative surveys of pest and overabundant species were undertaken through a comprehensive collection of monitoring programs. This includes 14 macropod abundance transects, vegetation condition (grazing) transects and grazing exclosure surveys.
- **Avifauna surveys:** Quantitative surveys were undertaken monthly for woodland bird species at 13 monitoring sites, with additional seasonal surveys for Scarlet Robin and Speckled Warbler. This

has confirmed a small but healthy population of Speckled Warbler and continued seasonal use of the area by the Scarlet Robin.

- Grey-headed Flying Fox and Swift Parrot surveys: GS LLS has established a survey program to provide quantitative assessments of their habitat use of the site over time. In consideration of the scale of the area to be monitored, GS LLS is using audio-monitoring technology for this survey.

2.3.2.4 Research programs

The purpose of research programs is to increase the effectiveness of the listed DEOH Offset Plan Management Actions. Through GS LLS engagement with a diverse range of academic partners, six strategic research programs are underway. An additional two research programs are under development.

GS LLS research is focused on the Offset Objectives they consider present the greatest uncertainty, or involve the least developed industry technology. In particular, they are interested in vegetation structural improvements (tree thinning and *Bursaria* management) and their application to Cumberland Plain Woodland. This topic is the focus of five of the current eight research projects.

A research program is also currently underway in collaboration with Western Sydney University to develop improved techniques for revegetating Cumberland Plain Woodland groundcovers on degraded soils.

2.4 Other compensatory measures

Indirect offsets (other compensatory measures) have not been quantified to date. These measures include the ABGMA TFPP and GA seed collection and production programs.

The GA program has been delivered, with activities described in previous implementation reports (**Section 1.1**) and therefore, is not discussed further in this report.

2.4.1 Threatened Flora Propagation Program (TFPP)

Stage 2 of the TFPP will draw upon the results of the *Pimelea spicata* genetic study and experience in propagation techniques gained throughout the Stage 1 TFPP. The program will establish a longer-term potted ex situ *Pimelea spicata* collection at the Mount Annan PlantBank, including 100 *Pimelea spicata* individuals collected from the WSI site for a genetic study.

The collection of cuttings from the WSI site was a result of many visits to the site over multiple years, during varied rain and temperature conditions. The collection provides a source of cutting material to develop a genetically diverse potted collection of *Pimelea spicata* to be used for future conservation work.

Funding has been committed by Infrastructure to maintain the *Pimelea spicata* collection at the Mount Annan PlantBank until 2025.

In addition to the 100 *Pimelea spicata* individuals for the TFPP Stage 2 genetic study, ABGMA maintains a collection of *Pimelea spicata* (approximately 530 individuals, and a further 400 cuttings, which reflects an increase on the 2022 collection). Approximately 130 *Marsdenia viridiflora* individuals from TFPP Stage 1 are also maintained at ABGMA for future use.

3.0 Conclusion

3.1 Outstanding offsets

During the 2022-2023 reporting period (25 August 2022 to 24 August 2023), 135 River Flat Eucalypt Forest credits, 12 Freshwater Wetlands credits, 102 *Dillwynia tenuifolia* credits, and 400 Southern Myotis credits were secured. Through these purchases, the full credit obligation for *Dillwynia tenuifolia* and Southern Myotis was satisfied.

Biodiversity offset credits are still required in relation to two ecosystem credit types and one species credit type (**Table 6**).

Table 6 Outstanding biodiversity credit requirements following the 2022-23 reporting period

Credit type	Original credits liability (BBAM)	Equivalent BAM credit liability	Credits Secured in 2022-23	Outstanding credits (BBAM)	Outstanding credits (BAM)
Ecosystem credits					
River Flat Eucalypt Forest (HN526/PCT 835)	2,661	n/a ⁽¹⁾	135 BAM	293	293
Freshwater wetland (HN630/PCT 1071)	926	545	12 BBAM	869	511 ⁽²⁾
Species credits					
Spiked Rice flower <i>Pimelea spicata</i>	107,068	53	-	107,068	53
<i>Dillwynia tenuifolia</i>	540	n/a ⁽¹⁾	102 BAM	0	0
Southern Myotis <i>Myotis macropus</i>	1,617	1,617	400 BAM	0	0

¹ An assessment of reasonable equivalence for the original credit liability was not undertaken, and an equivalent BAM credit liability is not expressed for this value. Appendix A provides a revised statement of reasonable equivalence for the outstanding credit liability as at 24 August 2022, and notes that matching credits are available on the BioBanking Credits register for these credits types.

² The outstanding credit requirement for HN630/PCT 1071 reflects the revised Statement of Assessment of Reasonable Equivalence (received 8 November 2022) that identified 518 BAM credits outstanding (Section 1.5), less the 12 BBAM (7 BAM) credits secured in 2022-2023.

Infrastructure has indicated it may also consider purchasing equivalent credit classes for ecosystems credits if like-for-like credits are not available in the NSW biodiversity credit market on satisfactory terms. This would only be undertaken on the basis of the Environment Department confirming that the equivalent credit classes are appropriate in each instance.

3.2 Anticipated 2023-24 BODP reporting period activities

Actions in the 2024 reporting period are anticipated to include further investigations into the availability of outstanding biodiversity offset credits, considering further options for securing these credits, and exploring alternative offset options.

In accordance with condition 30(14) of the WSI Airport Plan, Infrastructure must review the BODP every five years to ensure it continues to meet the approval criteria for that plan. A report on the review is

required to be provided to the Minister for the Environment and Water. The five-year review of the BODP will be undertaken during the 2024 reporting period.

In addition to the above review, an independent audit will be undertaken for the period between August 2022 to February 2024. This audit will be submitted to the Environment Department by 31 August 2024, as per the requirement under condition 30(11)(b) of the Airport Plan.

4.0 References

1. AECOM (2023a) Biodiversity Offset Delivery Plan Implementation Report 2020-2021. Report to Department of Infrastructure, Transport, Regional Development, Communications and the Arts
2. AECOM (2023b) Biodiversity Offset Delivery Plan Implementation Report 2021-2022. Report to Department of Infrastructure, Transport, Regional Development, Communications and the Arts
3. Bragg JG, Yap JS, Wilson T, Lee E, Rossetto M. (2021) Conserving the genetic diversity of condemned populations: Optimizing collections and translocation. *Evol Appl.* 2021 Feb 1;14(5):1225-1238.
4. Biosis (2022) Western Sydney Airport Biodiversity offset options report.
5. DSEWPaC (2012) *Environment Protection and Biodiversity Conservation Act 1999* Environmental Offsets Policy. Department of Sustainability, Environment, Water, Population and Communities, Canberra.
6. DIRD (2018) Biodiversity Offset Delivery Plan. Report prepared by GHD for the Department of Infrastructure, Regional Development and Cities, Australian Government
7. GHD (2020) Western Sydney International (Nancy-Bird Walton) Airport 2019 BODP Implementation Report. Report to Department of Infrastructure, Transport, Regional Development and Communications.
8. GHD (2021) Western Sydney International (Nancy-Bird Walton) Airport 2020 BODP Implementation Report. Report to Department of Infrastructure, Transport, Regional Development and Communications.
9. GHD (2022) Department of Defence Orchard Hills Offset Area Offset Plan. June 2022. Plan prepared for Department of Defence.
10. GML (2013), Defence Establishment Orchard Hills Heritage Management Plan. Plan prepared for the Defence Support and Reform Group (Northern NSW Region) and the Directorate of Heritage and Biodiversity Conservation, Department of Defence.
11. Local Land Services (2023) DEOH Biodiversity Offset Program Weed Management – Annual Report
12. OEH (2014) BioBanking Assessment Methodology 2014. Accessed at <http://www.environment.nsw.gov.au/biobanking/140661BBAM.htm>

Appendix A

Revised Statement of
Assessment of
Reasonable Equivalence
of biodiversity credits

Revised Statement of assessment of reasonable equivalence of biodiversity credits

A delegate of the Environment Agency Head of the Department of Planning and Environment has determined that the number of biodiversity credits required to be retired under the *Threatened Species Conservation Act 1995 (TSC Act)* as part of the development consent listed in Part 1, are reasonably equivalent to the number and class of biodiversity credits under the *Biodiversity Conservation Act 2016 (BC Act)* set out in Part 2.

This document outlines that determination, made in accordance with clause 22(3) of the *Biodiversity Conservation (Savings and Transitional) Regulation 2017*.

This statement of assessment of reasonable equivalence has been revised at the request of the Department of Infrastructure, Transport, Regional Development and Communications, to include a credit obligation associated with HN526, and replaces the previous statement dated 9 April 2020.

Part 1 Existing statutory obligation to retire credits

Request made by:	Commonwealth Department of Infrastructure, Transport, Regional Development, Communications and the Arts (formerly Department of Infrastructure, Transport, Regional Development and Communications)
Date received	24 August 2022
Development Consent reference	Western Sydney Airport, Airport Plan (December 2016)
Development name	Western Sydney Airport

Existing statutory obligation reference	Biodiversity credit name (Plant Community Type name and ID, or threatened species name)	IBRA sub region	Number of credits ¹
Western Sydney Airport, Airport Plan	Broad leaved Ironbark — Grey Box — Melaleuca decora grassy open forest on clay/gravel soils of the Cumberland Plain, Sydney Basin Bioregion (HN512, PCT 724)	Cumberland — Hawkesbury/Nepean	359.84

¹ Strikethrough indicates original credit obligation. The Department of Infrastructure, Transport, Regional Development, Communications and the Arts have requested that the credit equivalence be undertaken only for those biodiversity credits with remaining offset obligations (DOC22/798562 and DOC22/847440).

Western Sydney Airport, Airport Plan	Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion (HN526, PCT835)	Cumberland - Hawkesbury/Nepean	2,661.06 428
Western Sydney Airport, Airport Plan	Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion (HN528, PCT849)	Cumberland - Hawkesbury/Nepean	10,584
Western Sydney Airport, Airport Plan	Grey Box - Forest Red Gum grassy woodland on shale of the southern Cumberland Plain, Sydney Basin Bioregion (HN529, PCT850)	Cumberland - Hawkesbury/Nepean	2,162.01
Western Sydney Airport, Airport Plan	Phragmites australis and Typha orientalis coastal freshwater wetlands of the Sydney Basin Bioregion (HN630, PCT 1071)	Cumberland - Hawkesbury/Nepean	926 881
Western Sydney Airport, Airport Plan	Pultenaea parviflora	NA	60
Western Sydney Airport, Airport Plan	Marsdenia viridiflora subsp. viridiflora population in the Bankstown, Blacktown, Camden, Campbelltown, Fairfield, Holroyd, Liverpool and Penrith local government areas	NA	5,800
Western Sydney Airport, Airport Plan	Cumberland Plain Land Snail (<i>Meridolum corneovirens</i>)	NA	2,441
Western Sydney Airport, Airport Plan	Black Bittern (<i>Ixobrychus flavicollis</i>)	NA	242
Western Sydney Airport, Airport Plan	Southern Myotis (<i>Myotis macropus</i>)	NA	1,617 400
Western Sydney Airport, Airport Plan	Spiked Rice Flower (<i>Pimelea spicata</i>)	NA	107,068
Western Sydney Airport, Airport Plan	<i>Dillwynia tenuifolia</i>	NA	540-102

Part 2 Determination of reasonable equivalence

The number and class of biodiversity credits that are reasonably equivalent under the BC Act are:

Ecosystem Credits

1. **Name of Plant Community Type:** Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion (HN526, PCT835)

Number of ecosystem credits required	428 ²
Offset trading group	River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions
Hollow bearing trees	Vegetation containing hollow-bearing trees
Vegetation class	Coastal Floodplain Wetlands
Vegetation formation	Forested Wetlands
IBRA³ subregion	Cumberland and any IBRA subregion that adjoins the subregion within which the development occurs and any such subregion that is within 100 kilometres of the outer edge of the impact site.

² Matching credits are available on the BioBanking Credits register for HN526 in 28 Biobanking Agreements including BA413, BA406 and BA147. In accordance with the approved method a full recalculation of credit numbers for HN526 (PCT835) was not undertaken.

³ Interim Biogeographic Regionalisation for Australia

2. Name of Plant Community Type: *Phragmites australis* and *Typha orientalis* coastal freshwater wetlands of the Sydney Basin Bioregion (HN630, PCT1071)

Number of ecosystem credits required	518
Offset trading group	Coastal Freshwater Lagoons with a percent cleared value $\geq 70\%$ and $< 90\%$
Hollow bearing trees	Not applicable
Vegetation class	Coastal Freshwater Lagoons
Vegetation formation	Freshwater Wetlands
IBRA⁴ subregion	Cumberland and any IBRA subregion that adjoins the subregion within which the development occurs and any such subregion that is within 100 kilometres of the outer edge of the impact site.

⁴ Interim Biogeographic Regionalisation for Australia

Species Credits

3. Name of threatened species: Southern Myotis (*Myotis macropus*)

Number of species credits required ⁵	400
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4. Name of threatened species: Spiked Rice Flower (*Pimelea spicata*)

Number of species credits required ⁶	53
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⁵ There are matching credits available on the BioBanking credits register for Southern Myotis from BioBanking Agreements BA331, BA341, BA424 and BA383. In accordance with the approved method a full recalculation of credit numbers was not undertaken for Southern Myotis. A 1:1 ratio was used.

⁶ Matching credits are available on the BioBanking Credits register for Spiked Rice Flower (*Pimelea spicata*) from BioBanking Agreement with Credit ID749. In accordance with the approved method there should be no recalculation of the equivalent credit number, however in this instance the 1:1 ratio equates to 107,068 species credits and is considered unreasonable, given that there are only 149 credits on the BioBanking register and the species is now assessed via area of habitat under the BC Act. Therefore, a full recalculation of the equivalent credit numbers was undertaken, based on area of habitat.

5. Name of threatened species: *Dillwynia tenuifolia*

Number of species credits required ⁷	102
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This statement was issued on 8 November 2022.

Authorised by:



AMY DUMBRELL
A/Director Biodiversity Offsets Scheme
Department of Planning Environment
 Delegate of the Environment Agency Head

⁷ Matching credits are available on the BioBanking Credits register for *Dillwynia tenuifolia* from BioBanking Agreement BA 375, BA 413 and BA 381. In accordance with the approved method there is no recalculation of the equivalent credit number.