

Taxiway Zulu and Northern Compound
project, Melbourne Airport, Victoria:
EPBC Act Offset Management Plan for
Lot 1 TP379232, parts of 82\PP3580 and
Lots 2 & 3 TP238886 within Tiverton,
1316 Darlington - Nerrin Road, Dundonnell

Prepared for Australia Pacific Airports Melbourne

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Summary

Biosis Pty Ltd was commissioned by Australia Pacific Airports Melbourne (APAM) to prepare an Offset Management Plan (OMP) for a part of Tiverton, a pastoral property at 1316 Darlington - Nerrin Road, Dundonnell in western Victoria. The parcels of land which constitute the offset site cover about 132.99 ha and include portions of 82\PP3580 (TP425619) (about 40 ha in two sections), part of Lot 1 TP379232 (about 92.5 ha) and all of Lots 2 and 3 TP238886 (about 23.8 ha) within the Parish of Terrinallum (the offset site). The property is currently owned by Tiverton Property Partnering Pty Ltd.

The offset areas (patches of grassland) within the offset site (the broader parcels of land) meet the quantity and quality requirements for an offset of at least 77.9 ha of Natural Temperate Grassland of the Victorian Volcanic Plain (NTGVVP) as prescribed by Department of the Environment and Energy (DoEE) under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The offset area to be protected and managed under this plan totals 78.288 ha of NTGVVP. Specifically this plan addresses approval requirements under Referral 2016/7837 for the development of the Taxiway Zulu and Northern Compound project at Melbourne Airport, Tullamarine, Victoria.

This OMP requires that a number of existing land use rights are relinquished and that the primary objectives of management are to conserve and improve the defined areas of NTGVVP. The management outlined in this plan is specific to key management issues identified relevant to NTGVVP.

The offset site will be protected in perpetuity by an agreement under Section 173 of the *Planning and Environment Act 1988* with the Moyne Shire Council (MSC). The offset site is contiguous with other offset sites for different projects to the north managed by the same landowner.

This OMP details the management actions to achieve the habitat improvement gains required within the offset areas over the initial ten year period. The responsibility of vegetation management works lies with the offset land owner with oversight by a qualified ecologist and/or MSC.

The land owner will report annually over the initial 10 year management period to APAM and MSC regarding the progress of management works and will liaise with a qualified ecologist to develop annual works plans for each coming year.

A qualified ecologist will be engaged by the land owner to supervise and monitor the implementation of the OMP and to produce a report on the condition of the offset site to be provided to APAM and MSC at the end of management years 1, 3, 5 and 10.

The offset site will be permanently protected, and the quality of the site maintained by the land owner in perpetuity, to the standards reached at the end of the 10 year management period covered by this OMP. This OMP will be reviewed by a qualified ecologist at the end of the 10 year management period and updated if/as required.

Funding for achieving the ecological gains outlined in this OMP will be agreed between the land owner and APAM. Resourcing of this management plan will be monitored by a qualified ecologist and adequate funds must be provided to meet the management objectives outlined by this OMP. This will include agreed funding for anticipated ongoing management required to maintain the offset areas in perpetuity, beyond the initial 10 year management period.

Summary of management issues and associated actions

Management issues	Actions
Ongoing offset security	<ul style="list-style-type: none"> Agreement under Section 173 of the <i>Planning and Environment Act 1988</i> with Moyne Shire Council over land including the 77.917 ha of NTGVWP required for protection under the EPBC Act.
Survey and monitoring	<ul style="list-style-type: none"> Ecological monitoring of vegetation condition by a qualified ecologist (Section 3.6). Supervision and monitoring of site management by a qualified ecologist (Section 3.6). Monitoring and reporting on the condition of NTGVWP at the end of years 1, 3, 5 and 10 (Section 3.6).
Grazing	<ul style="list-style-type: none"> Maintaining inter-tussock spaces through prescribed biomass control works predominantly through the use of pulse grazing (Section 3.5.4). Sheep grazing regime using high numbers of sheep over a short period with the objective of managing total plant biomass. Exclude all domestic stock grazing between October 1st and January 15th (Section 3.5.4). The permanent removal of existing rights to graze any domestic stock with the exception of sheep. Grazing by cattle, horses, goats etc. will be excluded by the covenant (Section 3.5.4).
Fire	<ul style="list-style-type: none"> Where practical, undertake ecological burning to reduce biomass and promote species diversity of grassland forbs, as described in this OMP and in accordance with required safety procedures and assessment (Section 3.5.4).
Soil disturbance	<ul style="list-style-type: none"> Control pest animals such as rabbits, hares, cats and foxes to a standard exceeding existing legal requirements (Section 3.5.3). Restrict site access by maintenance of fencing and gates (Section 3.5.1).
Exotic plant invasion/ herbicide application	<ul style="list-style-type: none"> Undertake weed control works to lower the total cover of weeds from the current level (~30% cover) to less than 20% comprising < 1% cover for perennial grassy weeds and < 2% cover for broadleaf weeds over a ten year period (Section 3.5.2, Table 4). Skilled personnel with experience in grassland vegetation to use herbicide for weed control where required. Exclude herbicide application outside of these works. Target the control of existing high threat weeds as well as any future high threat weeds which may colonise the site (Table 4).
Fertiliser addition	<ul style="list-style-type: none"> Prevent application of any fertiliser and prevent exotic pasture improvement activities (Section 3.3 and 3.4).

1. Introduction

1.1 Project Background

Biosis Pty Ltd was commissioned by Australia Pacific Airports Melbourne (APAM) to prepare an Offset Management Plan (OMP) for land to be protected and managed as an external offset for the development of the Melbourne Airport Taxiway Zulu and Northern Compound project (Figure 1).

An ecological assessment of the project area has been documented by Biosis (2016) and identified 18.913 ha of vegetation which satisfies the definition of the threatened ecological community, Natural Temperate Grassland of the Victorian Volcanic Plain (NTGVVP) (Figure 2). NTGVVP is listed as Critically Endangered under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Use of the EPBC Act environmental offsets policy offsets assessment guide has identified that 77.9 ha of NTGVVP would need to be protected to offset the loss of the community from the nominated footprint of Taxiway Zulu and northern compound.

The development has been assessed through submission and approval of Referral 2016/7837 under the EPBC Act.

The external EPBC Act offset is proposed to be sourced from portions of 82\PP3580 (TP425619) (about 40 ha in two sections), part of Lot 1 TP379232 (about 92.5 ha) and all of Lots 2 and 3 TP238886 (about 23.8 ha) at 1316 Darlington - Nerrin Road, Dundonnell (Figure 3). An ecological assessment of the proposed external offset area (Tiverton) was conducted by Biosis (2017). This report provides the basic ecological information to support this OMP and identified remnant, largely contiguous patches of native vegetation.

Management of the external EPBC Act offset will involve protection and active ecological management of the 78.288 ha of high quality remnants of the Ecological Vegetation Classes (EVC) Plains Grassland (EVC 132) and Plains Grassy Wetland (EVC 132), which also correspond to the EPBC Act listed community NTGVVP (Figure 4 – the offset areas). These remnants occur within three broader parcels of land which together form the Offset Site.

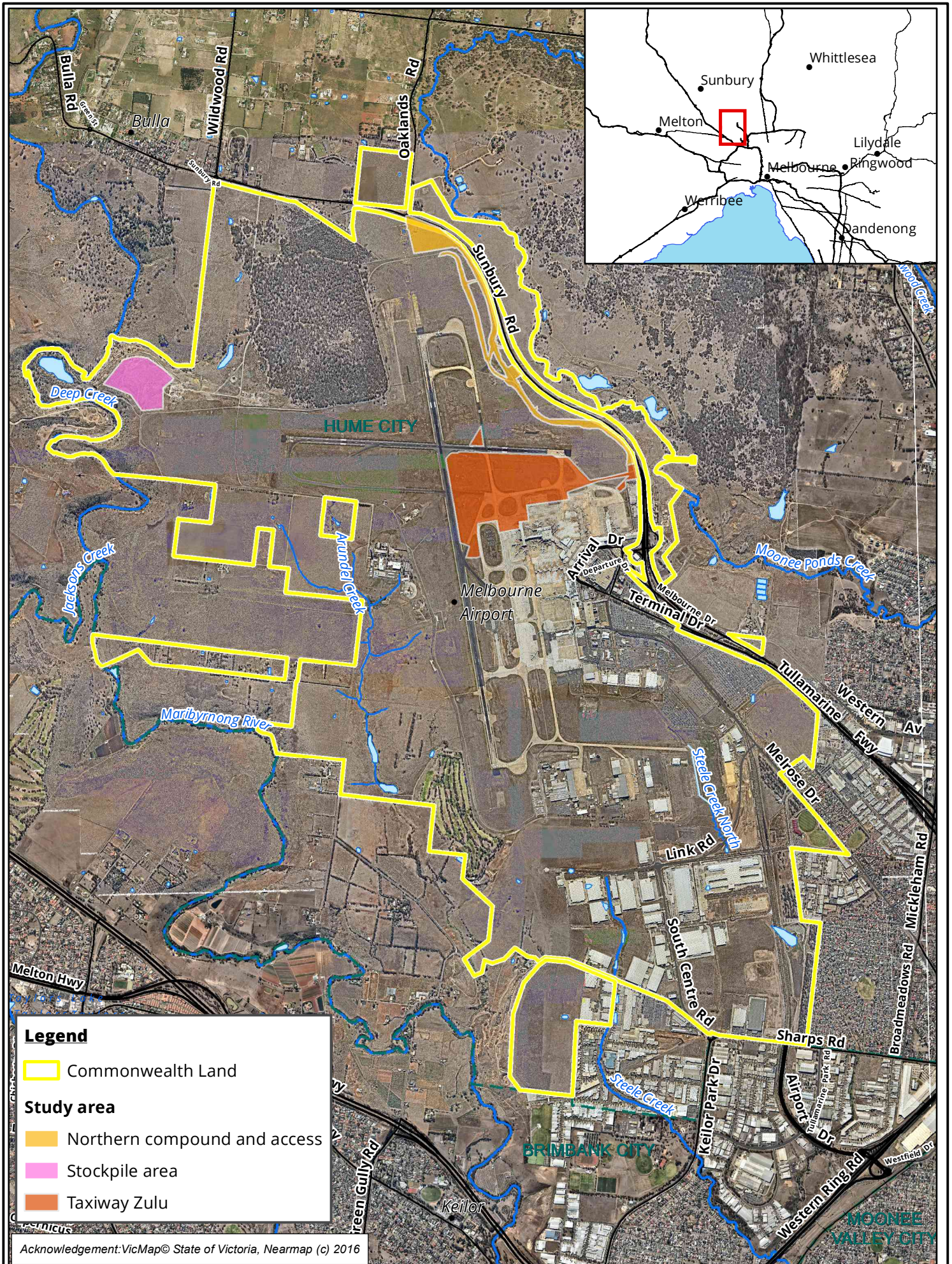
The offset site will be protected in perpetuity by an agreement under Section 173 of the *Planning and Environment Act 1988* with the Moyne Shire Council (MSC) (Figure 5). The offset site is contiguous with other proposed offset sites to the north, which will be managed by the same landowner.

Taxiway Zulu, the Northern Compound and the offset areas are within the Victorian Volcanic Plain (VVP) Bioregion.

1.2 Objectives

The objectives of this plan are to:

- Identify 78.288 ha of NTGVVP within Tiverton (portions of 82\PP3580 (TP425619), part of Lot 1 TP379232 and all of Lots 2 and 3 TP238886 at 1316 Darlington - Nerrin Road, Dundonnell) that are nominated as EPBC Act offset areas
- To contribute a gain in the protection of habitat for NTGVVP in a manner consistent with the EPBC Act Environmental Offsets Policy
- Identify the necessary management actions to protect and improve the quality of native vegetation and fauna habitat within the offset site.



Legend

Commonwealth Land

Study area

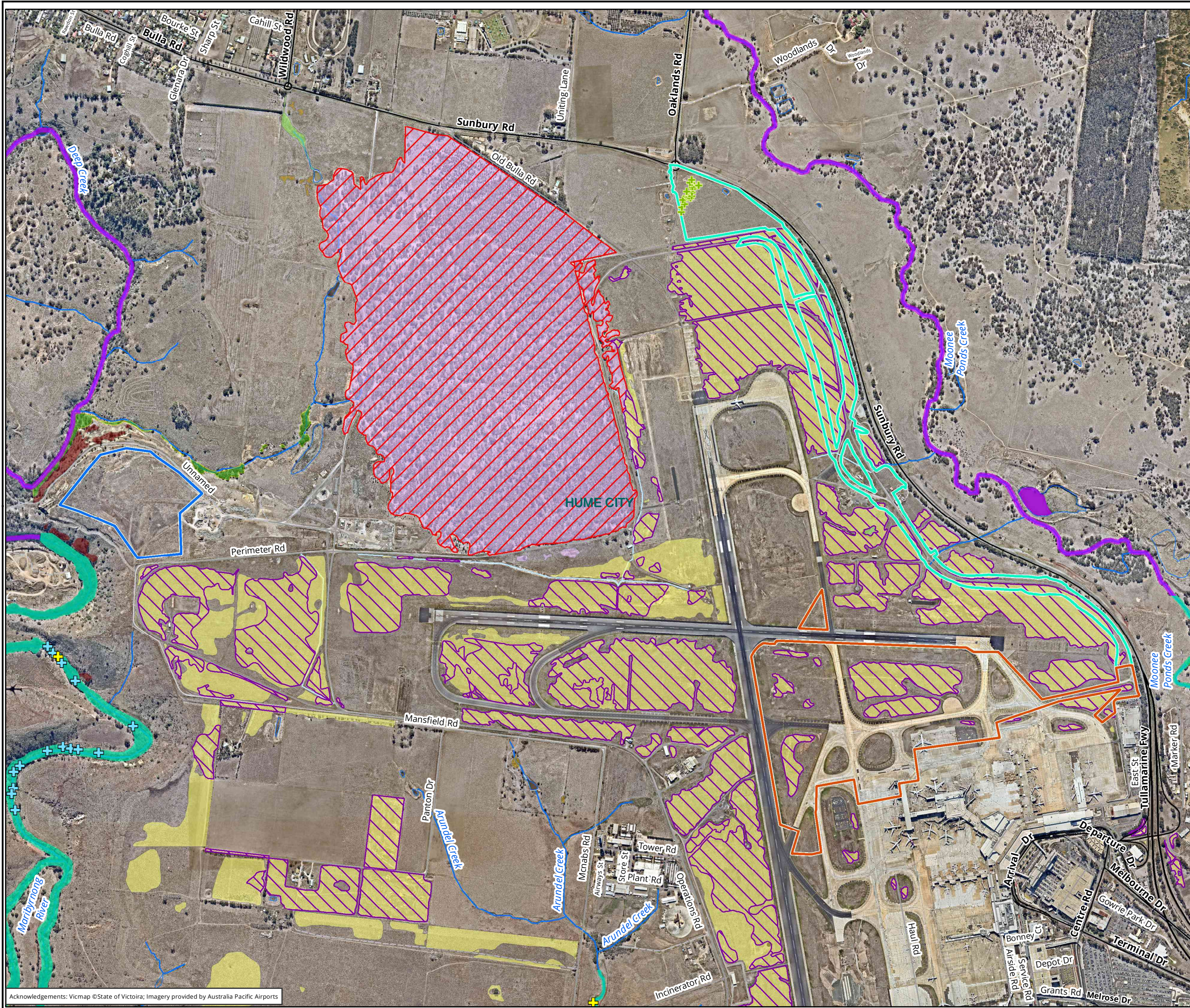
Northern compound and access

Stockpile area

Taxiway Zulu

Acknowledgement: VicMap© State of Victoria, Nearmap (c) 2016

Figure 1: Location of Taxiway Zulu and the northern compound, Melbourne Airport, Victoria



Legend

Study area

- Taxiway Zulu
- Northern compound and access
- Stockpile area

Matters of national environmental significance

- Growling Grass Frog habitat - assessed
- Growling Grass Frog habitat - likely
- Growling Grass Frog Biosis, 2013; 2014
- Growling Grass Frog Melbourne Water & Ecology Partners, 2010
- Grey Box (*Eucalyptus microcarpa*)
- Grassy Woodlands and Derived Native Grasslands of South-eastern Australia
- Natural Temperate Grassland of the Victorian Volcanic Plain

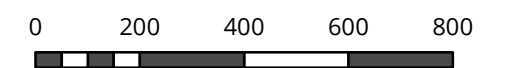
Ecological features

- Scattered trees (Grey Box)

Ecological Vegetation Class

- Creekline Grassy Woodland
- Escarpment Shrubland
- Hills Herb-rich Woodland
- Plains Grassland
- Plains Grassy Wetland
- Plains Grassy Woodland
- Riparian Woodland

Figure 2: Location of Natural Temperate Grassland of the Victorian volcanic Plain within the [proposed footprint of Taxiway Zulu and the northern compound, Melbourne Airport, Victoria.



Metres
 Scale: 1:14,500 @ A3
 Coordinate System: GDA 1994 MGA Zone 55



Ballarat, Brisbane, Canberra, Hobart, Melbourne, Newcastle, Sydney, Wangaratta & Wollongong

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 Date: 22 May 2017,
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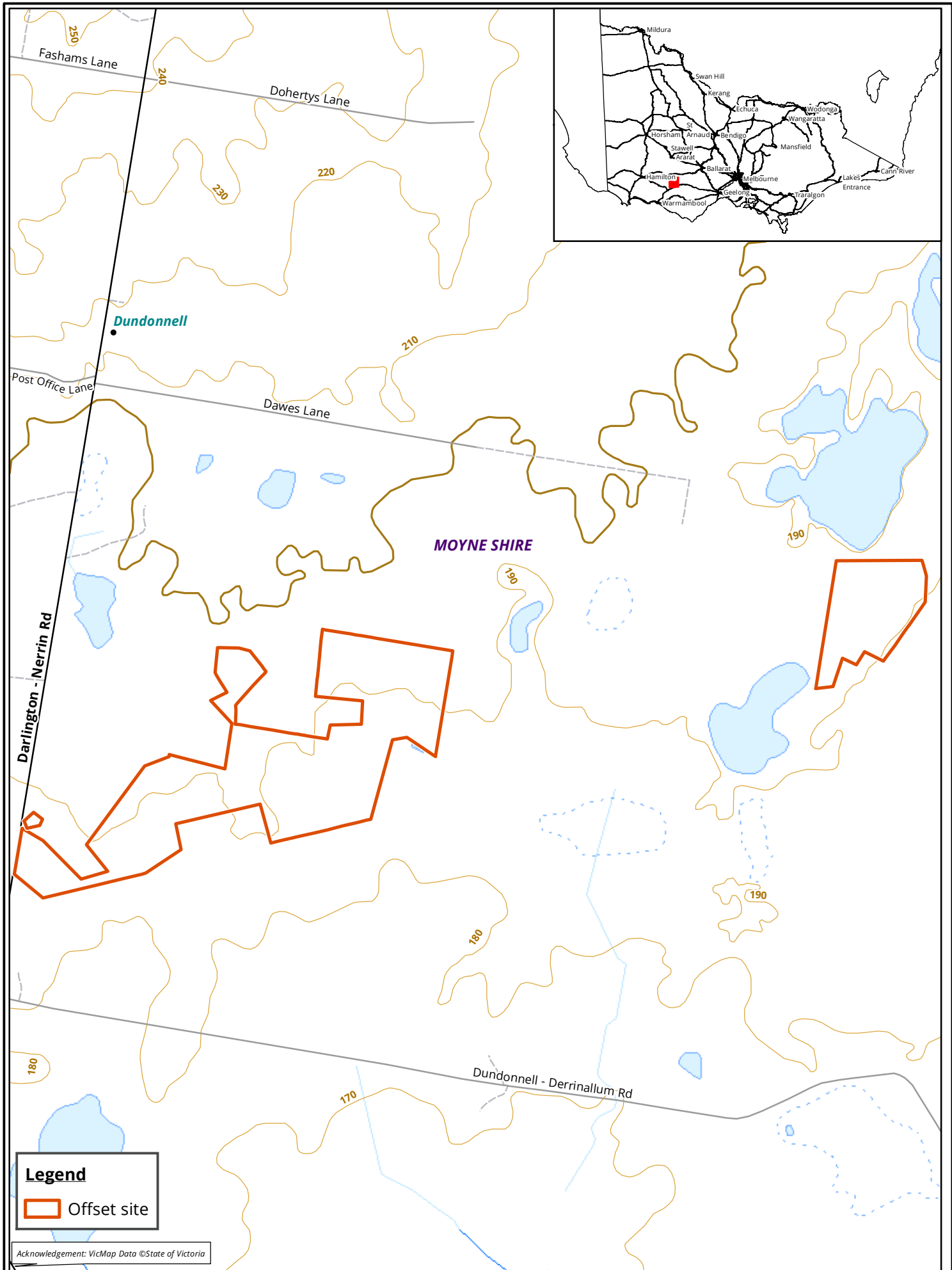
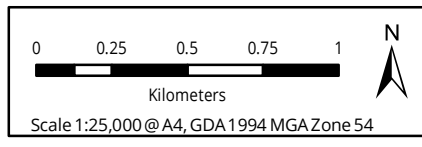


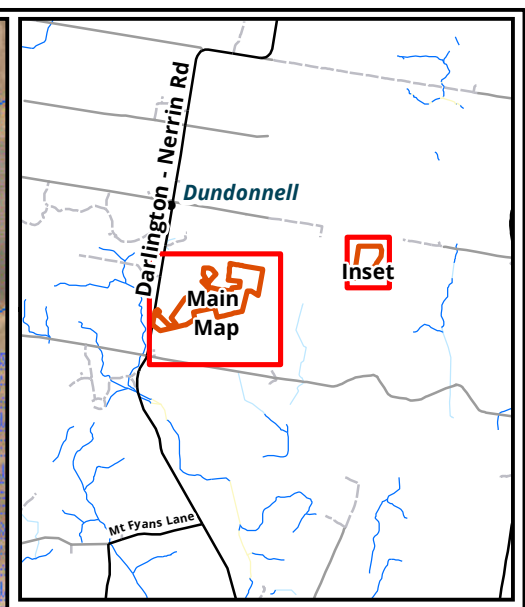
Figure 3 Location of the Tiverton offset site, 1316 Dalrington - Nerrin road, Dundonnell, Victoria



Biosis Pty Ltd
Albury, Ballarat, Melbourne, Newcastle,
Sydney, Wangaratta & Wollongong

Matter: 27049,
Date: 28 March 2018,
Checked by: SGM, Drawn by: SKM, Last edited by: smitchell
Location: P:\169005\16945 - THIRD RUNWAY MASTER





- Legend**
- Study area
 - EPBC Act listed vegetation**
 - Natural Temperate Grassland of the Victorian Volcanic Plain
 - Natural Temperate Grassland of the Victorian Volcanic Plain and Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains
 - Ecological Vegetation Class**
 - 125 Plains Grassy Wetland
 - 132 Plains Grassland

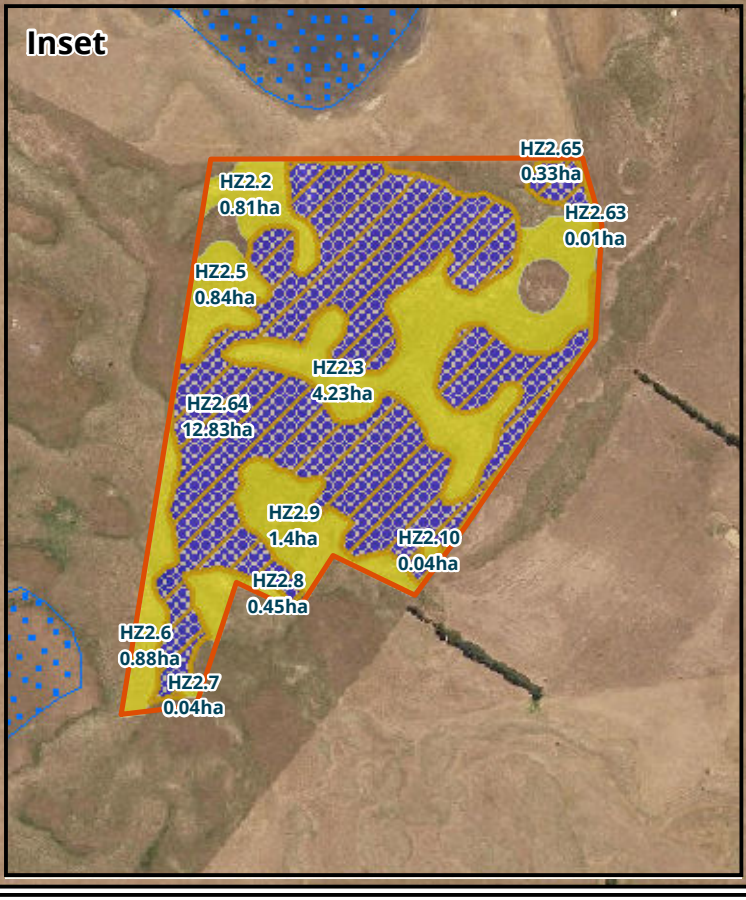


Figure 4 The extent of Natural Temperate Grassland Natural Temperate Grassland of the Victorian Volcanic Plain (NTGVVP) within the proposed offset area, Tiverton

0 100 200 300 400
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 Scale: 1:8,000 @ A3
 Coordinate System: GDA 1994 MGA Zone 54

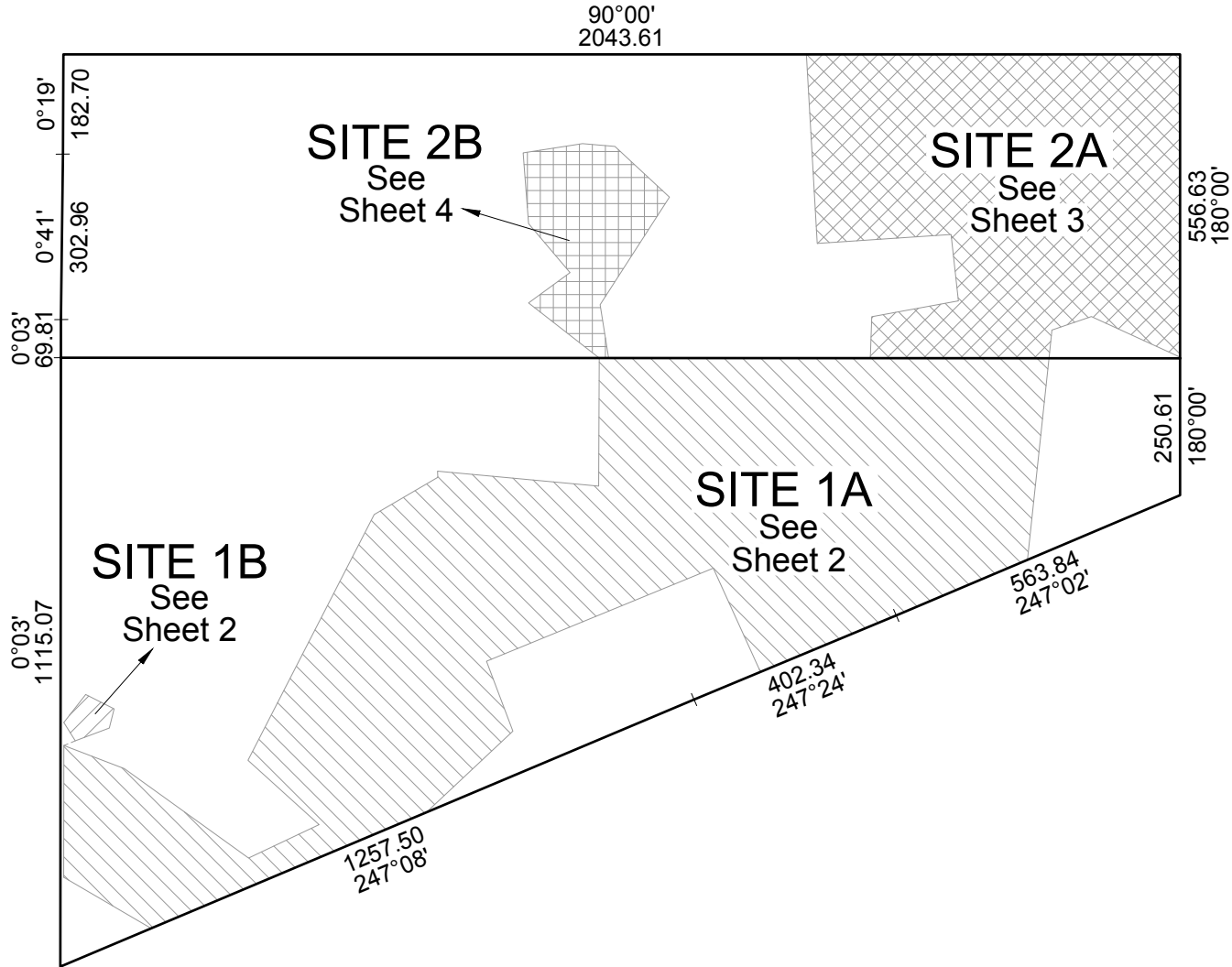


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Acknowledgements: VicMap © State of Victoria



DARLINGTON - NERRIN ROAD



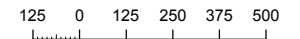
- SITE 1A**
- SITE 1B**
- SITE 2A**
- SITE 2B**

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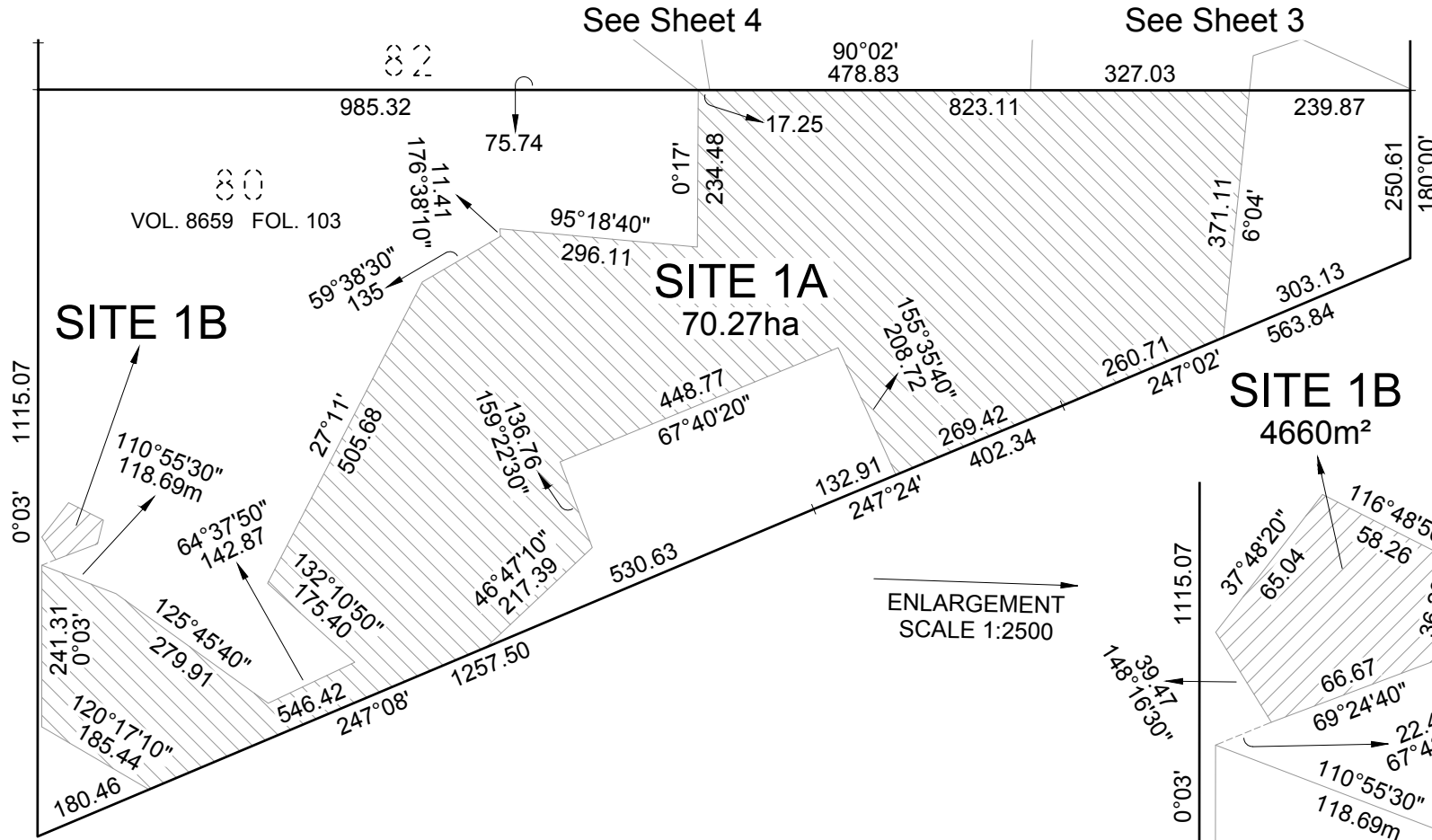
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DARLINGTON - NERRIN ROAD



See Sheet 4

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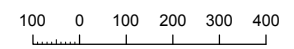
SITE 1A
70.27ha

SITE 1B
4660m²

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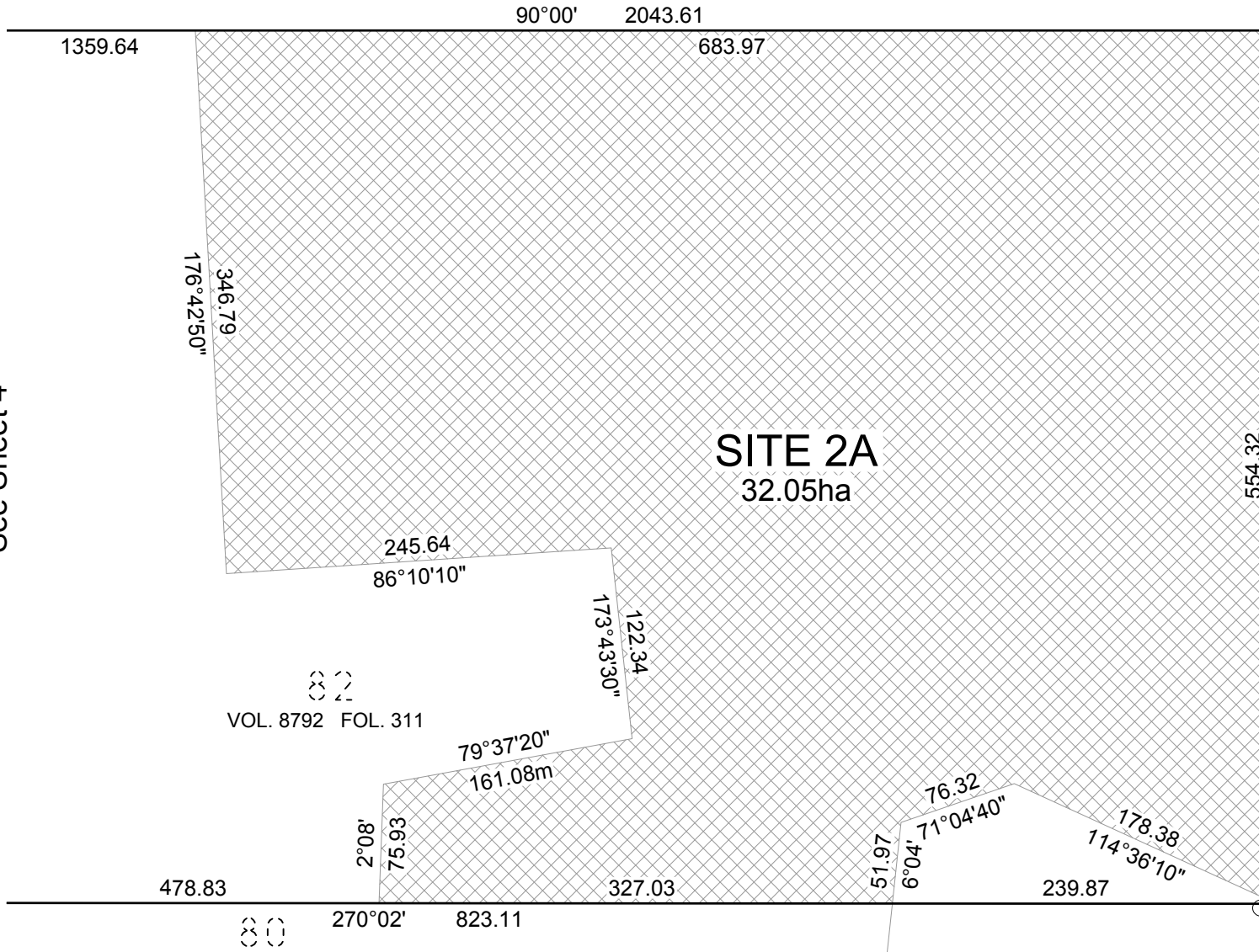
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- SITE 1A
- SITE 1B



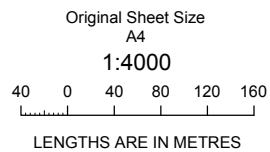
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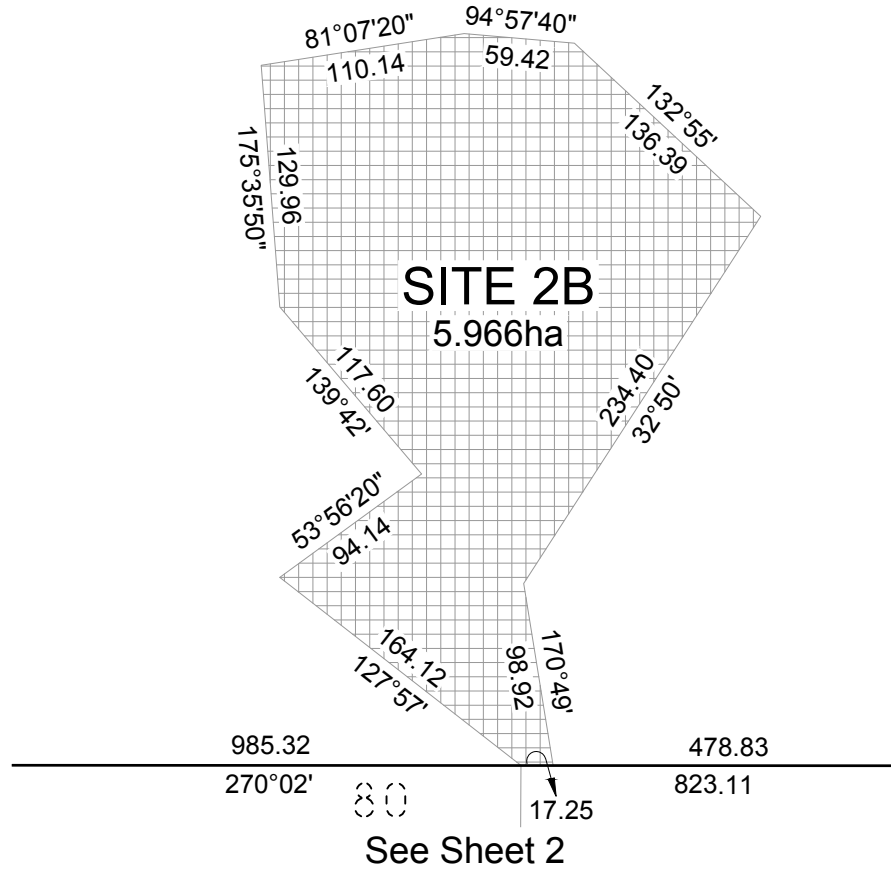
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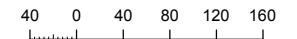
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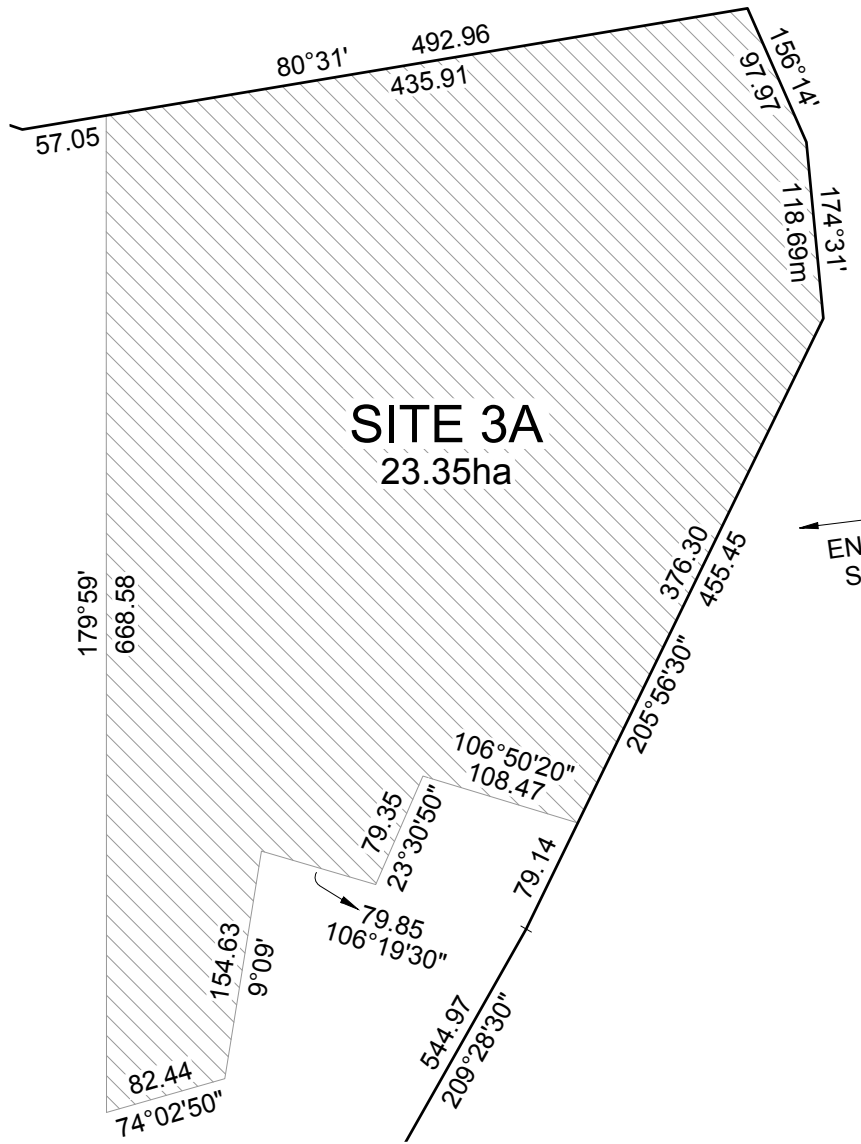
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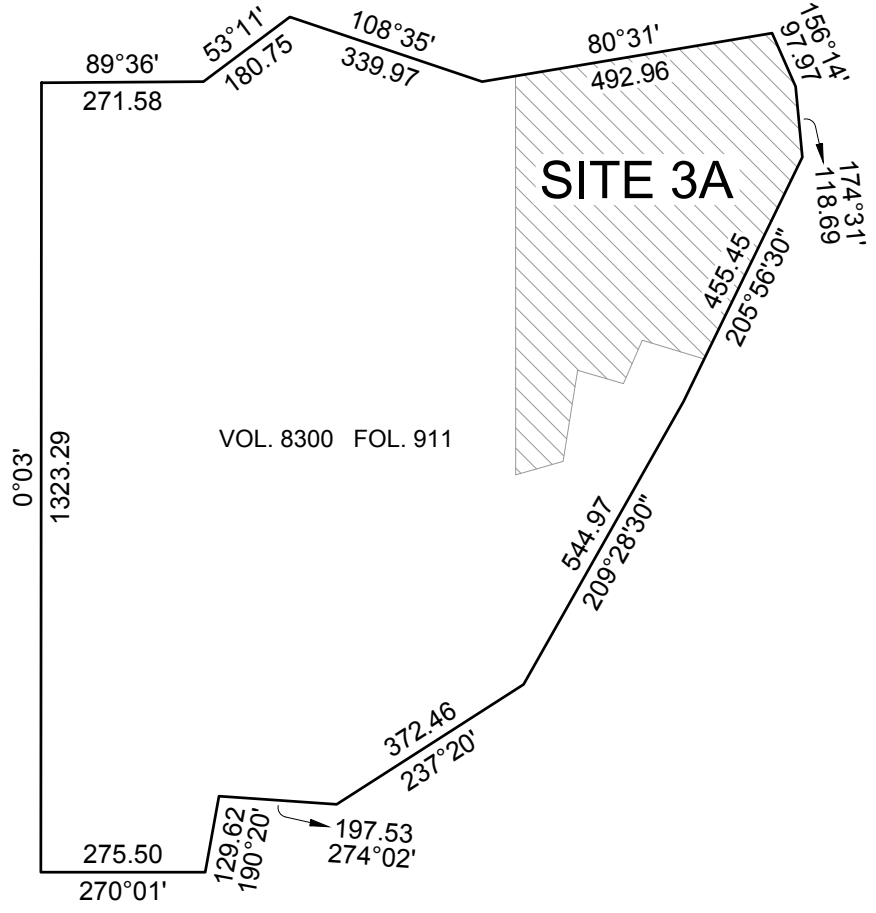
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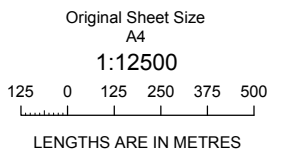
MGA94 ZONE 55



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SCALE 1:5000



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SITE 3A

2. Part A: Offset Suitability

2.1 Clearing Site Details

Landowner of clearing site	Australia Pacific Airports Melbourne
Location and address of clearing site	Melbourne Airport, Tullamarine
Land Tenure	Commonwealth land
Catchment Management Authority	Port Phillip and Western Port
Responsible Authority	Department of the Environment and Energy
Permit/approval applicant	Australia Pacific Airports Melbourne
Date Approved	2017

2.2 Native Vegetation within Clearing Site

Environmental assessments undertaken to inform the development of Taxiway Zulu and the northern compound (Biosis 2016) identified 18.913 hectares of native grassland vegetation within the project footprint which satisfies the definition of Natural Temperate Grassland of the Victorian Volcanic Plain (NTGVVP). Under Referral 2016/7837 this vegetation was approved for removal and offsets are now being secured to satisfy the commitments under the associated approval conditions. Details of the condition of this vegetation from the clearing site are provided below in Table 1.

2.3 Offset Targets

Vegetation losses and offset requirements were calculated using the spreadsheet provided under the EPBC Act offset policy (DSEWPaC 2012). The offset prescribed for the area of NTGVVP approved for clearing is presented in Appendix 1.

Offsets prescribed under the EPBC Act amount to the protection and management of at least 77.9 ha of NTGVVP. This plan outlines the location of the prescribed offset, the condition of the native vegetation to be protected, the management actions required to be implemented and the condition targets for that vegetation at the end of the ten year management period.

Consistency with the EPBC Act offsets policy is outlined in Table 2.

Table 1: Summary of native vegetation condition within the footprint of Taxiway Zulu and the northern compound (Biosis 2016)

Habitat Zone		HZ1		
Bioregion		Victorian Volcanic Plain		
EPBC Act listed ecological community		NTGVVP		
		Max Score	Score	
Site Condition	Large Old Trees	10	N/A	
	Canopy Cover	5	N/A	
	Lack of Weeds	15	9	
	Understorey	25	5	
	Recruitment	10	6	
	Organic Matter	5	3	
	Logs	5	N/A	
	Total Site Score		23	
	Standardised Site Score (x75/55)		31.28	
Landscape Value	Patch Size	10	2	
	Neighbourhood	10	1	
	Distance to Core	5	3	
	Total Landscape Score		6	
HABITAT SCORE		100	37.28	
Habitat points = #/100		1	0.37	
Habitat Zone area (ha)			18.913	
Habitat Hectares (Hha)			6.998	

Table 2: Compliance with EPBC Act Offset Requirements

EPBC Act Offset Principles	Current offset Site
Deliver an overall conservation outcome that improves or maintains the viability of the aspect of the environment that is protected by national environment law and affected by the proposed action	The offset proposal will ensure the protection of 78.288 ha of NTGVVP at Tiverton. The protection and ongoing improvement proposed will secure an MNES in perpetuity and removes or controls the current threatening processes which is active at both the clearing and offset locations. This management is essential to provide for the long term viability of the MNES within the offset site.
Be built around direct offsets but may include other compensatory measures	Habitat protection and management to improve vegetation condition is a direct offset.

EPBC Act Offset Principles	Current offset Site
Be in proportion to the level of statutory protection that applies to the protected matter	Entering the offset site data into the Environmental Offset Assessment Guide indicated that the offset package is in proportion to the level of statutory protection that applies (Appendix 1).
Be of a size and scale proportionate to the residual impacts on the protected matter	The Tiverton offset site protects 78.288 ha to compensate for an impact on 18.913 ha of NTGVVP (i.e. 4.1 times the area that will be lost with 80% of the offset at least one condition category higher than the condition of the vegetation lost).
Effectively account for and manage the risks of the offset not succeeding	<p>The offset site is subject to an approved OMP and will be protected by an agreement under Section 173 of the <i>Planning and Environment Act 1988</i> with MSC. The Tiverton offset will be managed by the land owner under supervision and audit by a qualified ecologist.</p> <p>The legal protection for the site will remove a number of existing permitted uses which, if otherwise remained active, could have a significant negative impact on the NTGVVP present. The protection associated with this OMP will remove rights to apply fertiliser and graze with domestic stock other than sheep while also imposing significantly greater requirements to control environmental weeds.</p> <p>The risk of loss without implementation of the offset is quantified as 20%. This is based on the risk related timeframe and observations of unmanaged grasslands within the bioregion. Similarly a low risk of loss (5%) is attributed to managed grasslands subject to legal protection.</p>
Be additional to what is already required, determined by law or planning regulations or agreed to under other schemes or programs (this does not preclude the recognition of state or territory offsets that may be suitable as offsets under the EPBC Act for the same action, see section 7.6)	No offsets for NTGVVP are prescribed under any State or Local Government offset prescriptions.
Be efficient, effective, timely, transparent, scientifically robust and reasonable	<p>The offsets will be actively managed by the landowner under this OMP, under the supervision and input from an independent ecologist. The overall offset package protects 78.288 ha of NTGVVP for the loss of 18.913 ha of this community.</p> <p>The NTGVVP proposed to be cleared occurs on Commonwealth land which is not actively managed to protect or even maintain the biodiversity values present. These values are likely to decline significantly over the short term (i.e. within 10 years).</p>

EPBC Act Offset Principles	Current offset Site
	<p>The proposed external offset is of comparable to higher quality (i.e. has a habitat score between 0.4 and 0.6). Formal protection of this vegetation would remove potential threats to the ongoing quality of this vegetation, which has the potential to decline significantly if existing permitted agricultural practices are not managed or excluded.</p> <p>The potential decline in the condition of the proposed offset of 1 unit from a starting quality of 4, 5 or 6 units within the risk related time horizon is considered conservative given the potential for the rapid decline in the condition of this vegetation type.</p> <p>A potential increase in quality of one unit for each condition category is considered reasonable given the positive response that grasslands can exhibit to active management with an ecological focus.</p>
<p>Have transparent governance arrangements including being able to be readily measured, monitored, audited and enforced.</p>	<p>Governance includes supervision and audit by an independent ecologist and formal reporting to MSC and APAM.</p>

2.4 Description of the Tiverton Offset Site

The offset site includes portions of 82\PP3580 (TP425619), part of Lot 1 TP379232 and all of Lots 2 and 3 TP238886, 1316 Darlington - Nerrin Road, Dundonnell. The site is approximately 50 km northwest of Colac and approximately 180 km west of the Melbourne central business district (Figure 3). The site is located approximately 165 km west of the proposed clearing site at Melbourne Airport. The property is currently zoned Farming Zone and is not covered by any overlays relating to biodiversity or inundation. The land is managed by Tiverton Property Partnering who also holds broader areas of farmland in this area. The site is currently used for domestic stock grazing.

The offset site assessed includes part of three broader parcels (the offset site) covering a total of approximately 132.99 ha (Figure 4). These parcels are largely dominated by Plains Grassland (EVC 132) and Plains Grassy Wetland (EVC 125) in relatively uniform condition but also supports smaller patches of Plains Sedgy Wetland (EVC 647). All of these EVCs are endangered within the VVP Bioregion. Areas of Plains Grassland and Plains Grassy Wetland also fit the definition criteria of the EPBC Act listed ecological community NTGVVP. The paddocks are fenced to control stock movements between the balance of Tiverton and other adjacent properties.

The proposed offset areas (the area subject to this OMP) are located in the south western corner of Tiverton (Figure 4). The offset site supports a mosaic of areas of native vegetation (habitat zones) which will be managed to provide the external offsets prescribed for development of Taxiway Zulu and the northern compound for Melbourne Airport (Referral 2016/7837).

Within the Tiverton property a total of 62 indigenous and 46 introduced plant species have been recorded (Appendix 2). Additional indigenous and weed species are likely to be present as seasonal conditions and survey intensity typically prevent the detection of all species present within a defined area.

While this report focuses on the nominated offset area, past inspections by Biosis at Tiverton indicate that the property also supports a variety of native vegetation communities (Biosis 2012, 2015). Other information identifying the extent of native vegetation includes a report prepared by DSE (2010) as part of a site assessment for BushBroker.

The study area has never been cultivated or subject to pasture improvement or intensive fertiliser application. However, at present pasture improvement activities and fertiliser application remain existing rights for this land.

NTGWVP

The NTGWVP within the offset area is made up of two Ecological Vegetation Classes (EVCs):

- Plains Grassland (EVC 132)
- Plains Grassy Wetland (EVC 125).

The Plains Grassland EVC is dominated by wallaby grasses *Rytidosperma* spp. and spear grasses *Austrostipa* spp. and occasionally Kangaroo Grass *Themeda triandra*.

The Plains Grassy Wetland areas are dominated by the perennial grass Common Tussock-grass *Poa labillardierei*. The distribution of the two EVCs is shown on Figure 4.

Where the cover of perennial grasses within Plains Grassland was less than 50%, the criteria for the listed community was otherwise met on the basis of having <30% cover of non-grass weeds. The composition of flora within each area of mapped native vegetation is consistent with the key diagnostic characteristics of the EPBC Act listed community.

Within Plains Grassland patches, there are a suite of annual grassy weeds that are dominant under certain conditions. At the time of assessment there was moderate cover of annual grasses (about 30%) over most of the patches. While these species may provide a prominent component of the plant biomass within the community, their relative cover does not influence the presence of the listed community on their own. Current management practices involve the control of some broad-leaf weeds and woody weed species (i.e. Horehound *Marrubium vulgare*). Consequently these weeds have very low cover on average across the study area which contributed significantly to the persistence of the listed community.

Areas mapped as Plains Grassy Wetland have sufficient cover of Common Tussock-grass to meet the definition requirements of the listed community. These areas are more prone to broad leaf weed infestation although the relative cover of these species is seldom given consideration as there is a sufficient cover of native forbs and perennial tussock grasses within the required seasonal assessment period.

2.4.1 Habitat hectares

It was determined that each area of grassland identifiable as NTGWVP was represented by two EVCs and a number of habitat zones ranging in condition scores of 39/100 to 64/100 (Biosis 2017, Appendix 3). The vegetation lies within the same broader management area (two adjacent paddocks). Dry conditions leading up to the assessment resulted in relatively uniform cover and composition of plant species within each EVC and numerous geophytes, including rare and threatened species known to occur within the assessment area were seasonally dormant.

Both EVCs can be considered in moderate condition (Appendix 3).

2.4.2 Threatened species

The broader parcels of land (about 200 ha) are known to support a number of threatened flora species (Biosis 2012 and 2015) including:

- *Asperula wimmerana* Wimmera Woodruff (rare in Victoria)
- *Coronidium gunnianum* Pale Swamp Everlasting (vulnerable in Victoria)
- *Geranium* sp. 3 Pale-flower Crane's-bill (rare in Victoria)
- *Microseris scapigera* Plains Yam-daisy (vulnerable in Victoria)

The local distribution of known records or habitat for these species is described in Table 3.

Table 3: Extent of habitat for rare or threatened flora species within the Tiverton property

Species	Conservation Status (Victoria)	Notes
Wimmera Woodruff	Rare	High quality habitat associated with areas mapped as Plains Grassy Wetland. Species recorded in or from contiguous habitat within the broader site.
Pale Swamp Everlasting	Vulnerable	High quality habitat associated with areas mapped as Plains Grassy Wetland. Species recorded in or from contiguous habitat within the broader site.
Pale-flower Crane's-bill	Rare	High quality habitat associated with areas mapped as Plains Grassy Wetland. Species recorded in or from contiguous habitat within the broader site.
Plains Yam-daisy	Vulnerable	High quality habitat associated with areas mapped as Plains Grassy Wetland. Species recorded in or from contiguous habitat within the broader site.

3. Part B: Offset Implementation – 1316 Darlington – Nerrin Road

3.1 Offset Site Details

Landowner of offset site	Tiverton Property Partnering Pty Ltd
Type of offset (onsite, 3rd party)	3rd party
Location and address of offset site	1316 Darlington - Nerrin Road, Dundonnell
Area of offset site (ha)	132.99 ha (78.288 ha of NTGWVP)
Offset site number (if applicable)	Not Applicable
Volume	
Folio	
Parish	Terrinallum
Allotment	Parts of Lot 1 TP379232 and 82\PP3580 and all of Lots 2 &3 TP238886
Local Government Area	Moyne Shire
Responsible Authority	Department of the Environment and Energy
Bioregion	Victorian Volcanic Plain

3.2 Strategy for Offset Site

The offset site is to be secured and managed for the purposes of conservation in perpetuity. The offset site is a smaller component of a larger site (Tiverton) which supports other offsets and is otherwise managed in a sympathetic manner on a voluntary basis. While it is the current land owner's objective to seek more formal agreements to protect the balance of this property there is no requirement for such an outcome.

3.3 Offset Security and Management Responsibility

Who is liable/responsible for meeting offset requirements?	Tiverton Property Partnering Pty Ltd/ Australia Pacific Airports Melbourne
Type of security	Agreement under Section 173 of the <i>Planning and Environment Act 1988</i> (132.99 ha).
Date 10-year offset management to commence	__/__/2018
Date 10-year offset management expires	__/__/2028
Date agreement registered on-title	__/__/2018
Offset site management responsibility (i.e. Landowner, Authority Name)	Tiverton Property Partnering Pty Ltd
Offset Monitoring Responsibility (i.e. Responsible Authority)	Moyne Shire Council

An offset site must be protected in perpetuity to qualify as an appropriate offset. The offset site (Figure 4) within the Darlington - Nerrin Road property will be secured in-perpetuity through an Agreement under

Section 173 of the *Planning and Environment Act 1988*. The encumbrance(s) registered on title will require the landholder to manage the offset areas in accordance with this OMP.

3.4 Ongoing Land-use Commitments

The offset areas will be managed for an improvement in quality over 10 years. After this period of management, the land will be required to be maintained in the condition achieved as a result of that management, in perpetuity. The deed will specifically state the in-perpetuity land-use commitments across the site are to:

- Retain and manage all native vegetation as directed by this OMP.
- Exclude domestic stock except as permitted by this plan.
- Exclude the use of stock food such as hay or grain that is sourced from outside the offset area.
- Eliminate any woody weeds and ensure that the cover of other high threat weeds does not increase beyond levels achieved at Year 10 of management.
- Ensure that pest animals are controlled to the level attained at the completion of Year 10 of management.
- Exclude pasture improvement and fertiliser application.
- Control the accumulation of ground cover biomass through either the controlled grazing of sheep or the controlled application of fire.
- Maintain a progressive annual works plan which caters to current conditions and prescribes ongoing management with maintenance of the native grassland community as its primary objective.

Implementation of this management plan is the overall responsibility of the land owner (Tiverton Property Partnering). However, direct management responsibility may be delegated to a designated site manager and/or managing ecologist. The land owner is responsible for engaging a qualified ecologist to conduct monitoring (Section 3.6) with reports submitted to MSC and APAM. Management actions by the land owner will be overseen by an independent ecologist as part of the legal protection over the site.

MSC will monitor implementation of the management plan and verify that the actions have been carried out appropriately.

Implementation of the plan will begin upon registration of the covenant.

Funding for implementation of this OMP will be agreed between the land owner and APAM. Where appropriate or otherwise agreed, funding will be held by MSC and paid to the land owner over the 10 year management period as per a land owner agreement. This will include agreed funding for anticipated ongoing management required to maintain the offset site in perpetuity, beyond the initial 10 year management period.

3.5 Management Actions

The main threats to the native grassland include the existing permitted uses associated with normal farming practices such as inappropriate grazing regimes, pasture improvement and fertiliser application. Other threats include the expansion of the existing high threat weed populations, weed invasion in general and the accumulation of ground cover biomass. Currently the ground cover biomass is managed through grazing by domestic stock (mainly sheep but there are no current restrictions on what domestic stock may be grazed on site) and this is proposed to continue as a strictly controlled management practice. In addition, ecological burning guidelines have been developed.

Currently the site is not actively managed for biodiversity values and is utilised for domestic stock grazing.

The prescribed management actions outlined below are intended to achieve a conservation outcome which improves and maintains the viability of the offset areas. This will be achieved through active ecological management (maintenance and improvement) and permanent protection of the offset site. Table 6 details these prescribed actions and outlines the relevant timing for implementation. These actions will be applied to the entire offset area identified in Figure 4.

Offsets will be achieved by:

- Maintaining the existing fencing within the broader land parcels, and limiting access to the existing access gates
- Weed control through active management:
 - Eliminating all woody environmental weeds
 - Controlling high threat weeds to levels specified in Table 4
 - Controlling perennial grassy weed cover to less than 1%
 - Controlling broadleaf weed cover to less than 2%.
- Managing organic litter (must not exceed the EVC benchmark cover of 10%).
- Biomass control through high intensity pulse grazing of domestic stock (sheep only) with grazing excluded from 1st October to 15th January.
- Undertaking ecological burning, if and when appropriate, to reduce biomass and promote native species diversity. Up to 50% of the offset area may be burnt at least four times within the 10 year management period e.g. years 1, 4, 7 and 10. No area is to be burnt more than once every two years.
- Controlling pest animals, particularly rabbits, hares, foxes and cats.
- Managing native species understorey diversity and recruitment.

3.5.1 Fencing, information and access control

Permanent fencing able to exclude domestic stock already exists around the boundary of the broader 133 ha parcels which form part of the Tiverton property. Additional fencing around the offset area (Figure 4) is not required as it is proposed that grazing within each paddock will be managed in accordance with the prescriptions outlined within this OMP. Temporary fencing may be used within the offset area where negligible impacts to native vegetation associated with the placement and removal of that fencing can occur.

Additional permanent fencing is also not recommended for the following reasons: 1) to avoid the need for establishing stock water access points which will displace native vegetation, 2) to avoid funnelling of traffic through access gates and associated disturbance to soil and 3) to discourage trampling of native vegetation by stock along fence boundaries. Instead, sheep will be allowed to graze the offset area as part of the broader existing paddock structure, with limitations described in the following paragraphs.

Posts marking the boundary of the offset site will be set up to clearly identify the area for monitoring and management purposes. Posts will be located in accordance with advice from a qualified ecologist to ensure adverse impacts to native vegetation are avoided.

If burning is conducted, temporary stock fencing will be established and maintained around the boundary of any burnt area within the offset site for at least 6 months post-burn to prevent stock access and damage to regenerating vegetation from grazing.

The offset area remains private property and access or disturbance to the offset site by unauthorised persons is prohibited. The existing access gate and security (locked gates) arrangement is adequate to service the access management requirements of this offset area.

If existing land-use rights are to be fully exercised in the remainder of each parcel, fencing to exclude stock from the offset site will be required.

No additional signs identifying the property as an offset site are proposed. Explicit signage may inadvertently attract undesirable impacts. However signs identifying the property as a protected area of native vegetation will be considered by the owner.

Actions

- Maintain existing fencing to control access by domestic stock to the broader land parcels and repair promptly if damage occurs.
- Temporarily fence any burnt area immediately prior to burning or immediately after wildfire, to exclude all domestic stock from grazing the burnt area for a minimum of 6 months.
- Establish posts to mark the boundary of the offset site for management and monitoring purposes under supervision from a qualified ecologist.
- Control access and any passive use to minimise impacts on native vegetation.
- Provide access for management vehicles into the offset site, using the existing access gates. No additional vehicle access is to be established.

3.5.2 Weed control

The OMP requires a quality improvement for NTGVWP. Targets below therefore identify a reduction in the cover of perennial weeds.

Annual grassy weeds are prominent and typically the total weed cover (annuals and perennials) is about 40%. The annual weeds, which are mainly grasses such as Fescue *Vulpia* spp., Soft Brome *Bromus hordeaceus* and Hair Grass *Aira* spp., which are not considered a significant threat in this environment, will be managed using grazing in an attempt to reduce their prominence. However, it is unlikely that any direct active management would have any impact on these species and no targets are proposed to for such species other than to prevent them increasing their current cover.

All high threat weeds are to be controlled to minimise or reduce their occurrence and ensure no further spread of weeds. The total cover of perennial grassy and broad-leaf weeds on site will be reduced from the current level of about 10% to no more than 2%. This includes specific targets for high threat species identified in Table 44, perennial grassy weeds will be reduced to less than 1% total cover and broadleaf weeds will be reduced to less than 2% of the cover by the end of the ten year management period.

The emphasis for weed control is the prevention of weed seed production with the goal being the reduction in the total weed cover with specific targets for high threat species on site. Weed control works will be timed appropriately in accordance with Tables 4, 5 & 6.

Weed levels will be monitored and management methods adapted over time in response to changing conditions. New and emerging high threat weeds will be monitored and controlled (to less than 1% cover) if found. Any other significant environmental weeds identified during the ongoing site monitoring will also be controlled. If other high threat weeds, such as Serrated Tussock *Nassella trichotoma*, are found to occur in surrounding areas owned by the offset land owner, it would be prudent and cost effective to eliminate such species from nearby areas to reduce any potential invasion into the offset area. The offset owner will contact the land owner of any public land (i.e. council managed road reserves adjacent to the offset site) where high threat weeds occur within the vicinity of the offset area, with the aim to have these weeds controlled.

Table 4: High threat weeds for priority control

Scientific Name	Common Name	% cover for the current assessment	Control Proposed	Desired Outcome [^]
<i>Agrostis capillaris</i>	Brown-top Bent	2%	Burn standing dead material. New growth controlled crash grazing by sheep to prevent seed set and herbicide application	<1% cover
<i>Avena spp.</i>	Oats	2%	Controlled pulse grazing by sheep to prevent seed set. Spot spraying appropriate herbicide to prevent seeding.	<1% cover
<i>Lolium spp.</i>	Rye-grass	<5%	Controlled pulse grazing by sheep to prevent seed set. Spot spraying appropriate herbicide to prevent seeding.	<1% cover
<i>Phalaris aquatica</i>	Toowoomba Canary-grass	5%	Spot spraying appropriate herbicide (early spring).	<1% cover
<i>Holcus lanatus</i>	Yorkshire Fog	5%	Spot spraying appropriate herbicide (early spring).	<1% cover
<i>Hordeum spp.</i>	Barley-grass	2%	Spot spraying appropriate herbicide (early spring).	<1% cover
<i>Cirsium, Silybum, Carduus and Sonchus spp.</i>	Thistles	1–2%	Spot Spraying appropriate herbicide (prevent flowering).	<1% cover

[^] Desired outcome after 10 years of ecological management

Woody weeds are known from the offset areas (i.e. Horehound) and the broader parcels of land. However these are only present at a very low cover. If any woody weeds are observed during site management or monitoring activities, these need to be controlled and eliminated promptly (before fruiting and seed set). The cover of woody weeds will be maintained within the offset areas at <1% in perpetuity.

Spot spraying with appropriate herbicide is the main method for reducing weed cover. Spot spraying will be undertaken regularly, particularly in spring and early summer, with a focus on killing weed plants prior to seed set. Biomass control is also considered as an effective method for controlling and reducing weed levels. Biomass control at the site will include controlled sheep grazing and ecological burning. Spot spraying will be completed in a manner which minimises non-target damage. Spot spraying will not occur during high wind days or in close proximity to threatened flora without protective measures in place (i.e. physical shielding).

Burning is particularly effective at reducing weed cover, especially for species that are difficult to control such as Brown-top Bent *Agrostis capillaris*. Burning and/or grazing will allow greater access and efficiency for weed control and increased natural regeneration of indigenous plant species (Sections 3.5.4 and 3.5.5 below). Periodic burning that is followed by spot spraying will be important for weed species that are difficult to control (such as Brown-top Bent) until they are replaced by native species.

Target species are likely to change over time in response to seasonal conditions, the result of pulse grazing or the conduct of any controlled burns (e.g. likely flush of broad-leaf weeds to be treated post-burn). Weed cover and species will therefore be monitored and management adapted in response to achieve desired outcomes

outlined in this management plan. An ecologist will be consulted and approve the control techniques for any new or emerging weeds identified within the offset area.

The offset area is not in close proximity to any named waterway although a number of seasonal wetlands occur within this parcel and its surrounds. While there may be localised surface water flows during high rainfall events, any wetland within the site is ephemeral and no specific runoff risk is identified for the application of herbicides to this area.

Actions

- Periodic spot spraying of weeds with appropriate herbicide will be undertaken, particularly through spring and early summer.
- Target weeds will be controlled in a timely manner and before seed set; this requires regular monitoring and treatment.
- Ensure the absence of high threat woody environmental weeds within the offset area through monitoring and if high threat woody environmental weeds are found to occur, control and eliminate promptly. Preferably control nearby infestations to prevent the spread of these species.
- Control works will ensure that the total cover of perennial weeds will be reduced to no more than 2%. Specific targets include: a reduction of high threat weeds in accordance with Table 4; perennial grassy weeds will be reduced to less than 1% total cover; and broadleaf weeds reduced to no more than 2% cover.
- Monitoring will be undertaken to demonstrate the effectiveness of weed control works and the results are to be used to adapt future control works and targets.
- Any populations of new and emerging high threat weeds will be treated promptly and eliminated to <1% cover. This will be done in consultation with a qualified ecologist.
- Any other significant environmental weeds identified during the ongoing site monitoring will also be controlled in consultation with a qualified ecologist.
- During weed control, natural regeneration of indigenous flora will be protected from off-target damage.
- Biomass management will be undertaken as per Sections 3.5.4 below.

3.5.3 Pest Animals

The control of vermin including rabbits and other pest herbivores within the offset site is a requirement of this OMP. While no active rabbit warrens were noted in the offset area, grazing by European Rabbits *Oryctolagus cuniculus* and European Hares *Lepus europeaus* is evident and is likely to have a significant impact within the offset area.

Currently rabbits and hares are controlled by shooting and this appears to be effective at this point in time. If this changes in the future, baiting can be considered as an option for control of these pests.

Control within the offset site would effectively be achieved through a reasonable level of works to eliminate any active warrens in the local area (i.e. land within the owners control and within 500 m of the offset site). Control will in part be achieved through the removal and destruction of the shelter provided by any shrubby weeds within the broader area managed by the same landowner. The landowner will therefore control all shrubby environmental weeds on their land within 500 m of the offset site. Control of rabbits will be undertaken in accordance with current guidelines provided by the relevant Victorian Government Department.

Ripping of rabbit warrens within the offset site is not permitted. If any warrens develop within the offset site they will be treated by low impact measures such as fumigation or implosion.

Other problem pest animals may include cats and foxes although the general lack of shelter and harbour for these species reduces the likelihood that any animals are resident in the local area. Control techniques such as poisoning are therefore likely to be ineffective. The landowner will select from the range of control techniques available and apply the most effective in the local conditions.

Actions

- Control and seek to locally eliminate European Hares, European Rabbits, cats and foxes and using appropriate control techniques including shooting, poison baits or similar methods, without soil disturbance.
- At a minimum spotlight shooting over a minimum period of three hours targeting all pest animals will occur over the entire site once every three months. This will be conducted by the landowner or a professional shooter employed by the landowner;
- Fumigate rabbit warrens within three weeks of detection. Fumigation works will be conducted by a suitably qualified operator.

3.5.4 Biomass / Organic Litter control

Biomass management is essential to maintain indigenous flora and fauna values throughout the offset site. Biomass management is also required to maintain inter-tussock spaces and prevent excessive competition to grassland forbs. Where there is a sustained build up in ground cover biomass over any one year, resulting in a reduction of inter grass tussock space to an average of less than 30%, biomass will need to be actively reduced. Judgements on the cover of inter-tussock space and the build-up of groundcover biomass will be made by the landowner in consultation with a qualified ecologist. The independent ecological monitoring will also assess the effectiveness of the biomass control techniques applied and the need for any adjustments to the management regime to provide the prescribe outcome.

Controlled grazing will be applied to reduce biomass and maintain an open tussock-grass structure for this grassland, and where appropriate, ecological burning may also be considered.

Use of grazing for ecological management

Currently the offset site is subject to unrestricted grazing by sheep. Given the diversity of native species found within the uncultivated native grasslands of this site, this method of disturbance regime (grazing by domestic stock) is seen as a reliable and conservative action to maintain and improve the ecological values associated with the area. While grazing by domestic stock will continue to be used at this site as a method of biomass reduction, it will be undertaken in a controlled manner following a grazing management plan. Biomass accumulation control at this site will therefore be consistent with the standards for management of ecological grazing provided by DSE (2009).

In this context pulse grazing (i.e. using high numbers of sheep over short periods) in the offset area to maintain an open tussock grassland structure is seen as a precautionary management method to maintain the species richness of these native grasslands. Grazing of domestic stock will be restricted to the use of sheep. Grazing by other domestic stock including but not restricted to cattle, goats and horses is to be excluded from the offset site by this plan.

The timing of grazing will be strictly controlled to allow native species to grow and set seed over the spring to mid-summer period (DSE 2009). Stock will be excluded annually from October 1st to January 15th, in perpetuity. Table 5 provides targets to be met for ongoing management of grazing within the offset area. The landowner will keep records of the number of sheep and duration of grazing within the offset area. This data will be provided as part of annual reporting. This data and the resultant impact on biomass will provide the basis for an on-going grazing strategy.

Table 5. Requirements and limit of grazing activities within the offset area

Period where grazing by domestic stock is not permitted	1 st October to 15 th January in perpetuity
Pulse grazing cycles required	3 (minimum)
Grazing required prior to exclusion period	2 weeks prior to commencement of exclusion period
Minimum rest from grazing between pulse grazing	2 weeks
Maximum continuous pulse grazing	4 weeks
Biomass management thresholds	Total vegetation cover of no greater than 70%
Target inter-tussock space	Minimum 30% of total offset area cover

Grazing will occur over a short duration and exceed the standard stocking rate to prevent selective grazing and allow for periods of grazing exclusion. The maximum length of continuous grazing is 4 weeks with at least 2 weeks rest between cycles. Biomass management objectives are that inter-tussock space will be maintained to at least 30% and the total vegetation cover will not fall below 50%. At least 3 pulse grazing cycles will occur within the grazing period, one of which will occur immediately prior to the exclusion period.

The only exception to requirements specified for pulse grazing is if an ecological burn is planned during or following the pulse grazing period. In this instance a fire management plan produced by a qualified contractor will inform when grazing will be removed to allow for a build-up in biomass to establish a burn.

Sheep used for pulse grazing will be shorn within the previous 1-2 months to reduce likelihood of weed seed introductions. Stock transfer into the offset site will be timed to minimise the potential for weed seed transport via mud (i.e. stock movements into the offset site will be excluded within two days of rainfall). The 200 ha parcel will need to be monitored during wet periods to prevent excessive soil disturbance in areas of Plains Grassy Wetland. Following any high rainfall events, stock will be removed immediately.

Use of fire for ecological management

If required, burning within the offset area will be undertaken only with due consideration to relevant health and safety issues, in consultation with the Country Fire Authority and in line with a fire management plan completed by a suitably qualified consultant. Any approved fire plan will also be provided to MSC at least three weeks prior to any burning event identified within that plan. The following provides guidelines for use of burning only in an ecological sense. The land owner is responsible for ensuring the requirements of this OMP can be carried out only if compliant with all other government planning requirements and permits.

While grazing by domestic stock will be the typical manner in which ground cover biomass will be regulated, the controlled application of fire is an efficient and cost-effective alternative technique for reducing biomass in grassy ecosystems such as those that occur within the offset site. Importantly, burning (c.f. grazing or slashing) allows greater access and efficiency for weed control and increased natural regeneration of indigenous plant species. While burning may enhance germination of indigenous species, it can also be expected to promote certain exotic species and as such post-burning weed-control will be vital in maintaining remnant vegetation. However stimulating the soil stored weed seed bank is seen as positive as this allows this seed bank to be exhausted through active management.

The controlled application of fire may be used for biomass reduction in all or parts of the offset site. Selected areas of grassland may be burnt to tackle particular weed issues or to assist in the lowering of soil nitrogen

and phosphorous which would also assist in weed control works. However no area is to be burnt more frequently than every two years and no more than 50% of the offset site will be burnt in any one year.

Whenever burning is utilised, the landowner will prepare maps identifying the fire history of the offset area to ensure compliance with the area restrictions identified above.

The extent, intensity and timing of burns must take into account the presence of threatened species, such as the Striped Legless Lizard which may be present in the offset area. Fire may kill individuals of this species during the warmer months of the year when they are active above the soil surface. Timing of burns should only be undertaken when soil moisture is low and soil cracks are still present allowing refuge for Striped Legless Lizard and other herpetofauna.

Any ecological burns will be conducted during benign (low wind and mild temperature) weather conditions and may be patchy (i.e. not result in the uniform burning of all areas). Patchy burns are a desirable outcome.

Actions

- Develop a grazing plan consistent with Table 6 for the offset area, including timing and intensity;
- Exclude grazing during wet periods where ground disturbance would occur;
- If burning is to be utilised, engage a qualified contractor to produce a fire management plan which allows for an ecological burning regime described in the following dot point. Provide any approved burn plan to MSC at least three weeks prior to any burning event identified within that plan.
- Note that the use of fire is not a compulsory component of this plan and may also be used at a much reduced scale if considered appropriate (i.e. localised burning of small areas for weed or biomass control);
- When planning burns, liaise with any relevant regulator regarding appropriate planning and permits in a timely manner;
- Plan and conduct ecological burning within different seasons to promote regeneration of a variety of species. However ensure burns consider the ecological needs of any threatened species which may be present (e.g. Striped Legless Lizard).

3.5.5 Understorey Diversity and Recruitment

The major threats to understorey diversity in these grasslands are over-grazing by domestic stock and other introduced herbivores, competition from introduced plant species and the accumulation of biomass over a prolonged period (greater than a year). These areas of Plains Grassland and Plains Grassy Wetland retain between 50 and 90% of the expected number of understorey life-forms for this EVC, and are generally not considered deficient in terms of the species diversity of the life-forms that are present. Missing or deficient elements are typically the large herbs and this is largely a function of the growth stage of the plants present. Enrichment planting is therefore not currently necessary although this will be reviewed by the independent ecologist monitoring the site after five years of active ecological management.

Controlled grazing by domestic stock and the control of rabbits and hares are required to maintain understorey diversity and encourage recruitment of threatened species. Fire or other forms of biomass reduction will also be required to facilitate regeneration, remove the dead biomass associated with weed control works and maintain inter-tussock spacing. Biomass control works will also reduce the potential for uncontrolled wildfire to impact this site.

Active management will seek to significantly reduce the cover of all exotic species with specific targets for high threat species given in Table 4.

Actions

- Active weed management to be undertaken as outlined in Section 3.5.2
- Biomass will be managed to enhance recruitment – see Sections 3.5.4 above.

3.5.6 Supplementary Planting and Revegetation

There is currently no need to do any supplementary planting or revegetation within the offset site. There is a high diversity of understorey species in this area and improvement will mainly be achieved through weed control. This decision will be reviewed by the independent ecologist after five years of active management.

Table 6: Management plan actions and timing for offset areas within the Tiverton offset site

Year number	Action No	Required preceding action*	Activity Description	Timing of activity - month(s)	Quantity	Units	Who is responsible for this action?	Standard to be achieved
0	0.1	-	Establish offset site (132.99 ha) to protect the grassland offset areas (78.288 ha).	Upon registration of the agreement. This action is a key requirement defining the start of the prescribed management period.	132.99	ha	Land Owner	Agreement under Section 173 of the <i>Planning and Environment Act 1988</i> with the Shire of Moyne covering 132.99 ha.
0	0.2	-	Ensure appropriate fencing is established. Fencing already protects the broader parcels of land within which the offset sites are located. The offset areas allocated to this specific OMP do not need to be fenced separately unless existing land-use rights are fully exercised in the balance of the broader parcels.	This action is a key requirement defining the start of the prescribed management period.	-	-	Land Owner	Offset areas isolated from activities excluded by this plan (i.e. construction works, uncontrolled grazing by domestic stock).
0	0.3	-	Establish markers to identify boundary of the offset site to assist with management and monitoring of the area.	This action is a key requirement at the start of the prescribed management period.	-	-	Land Owner in consultation with qualified ecologist	Markers established to identify the boundary of the offset site.

Year number	Action No	Required preceding action*	Activity Description	Timing of activity - month(s)	Quantity	Units	Who is responsible for this action?	Standard to be achieved
0	0.4	-	Qualified ecologist to undertake baseline monitoring, establish monitoring points and refine management actions based on baseline results.	Oct-Nov monitoring	1	Report	Qualified ecologist	Prepare monitoring report including photos and confirm agreed performance measures outlined in Section 3.5.

Year number	Action No	Required preceding action*	Activity Description	Timing of activity - month(s)	Quantity	Units	Who is responsible for this action?	Standard to be achieved
1	1.1	0.1-0.4	Land owner to develop annual works plan in consultation with the qualified ecologist based on a site inspection.	Upon registration of the covenant.	-	-	Land Owner and qualified ecologist	Annual works plan prepared and approved for implementation by qualified ecologist.
1	1.2	1.1	Maintain fences and gates around broader offset area and markers around offset site in good working order. Remove any rubbish present within the offset site.	Continuous (inspection and management)	-	-	Land Owner	Potential threats (i.e. rabbits, domestic stock, unauthorised entry) excluded.
1	1.3	1.1	Undertake pulse grazing to reduce biomass. A minimum of three pulse grazing cycles are required within the grazing period, and one of these will occur immediately before the exclusion period (unless otherwise advised by the fire management plan). The maximum grazing length at any one time is four weeks with a minimum two week rest period between grazing cycles. Vegetation cover will not be grazed below 50% and inter-tussock space will be maintained to at least 30%.	31 st January – 31 st July	132.99	ha	Land Owner	Maintain an open tussock grassland with at least 30% cover of inter-tussock space.

Year number	Action No	Required preceding action*	Activity Description	Timing of activity - month(s)	Quantity	Units	Who is responsible for this action?	Standard to be achieved
1	1.4	1.1	Control pest animals (e.g. rabbits, hares, foxes and cats) within the offset and surrounding area (within 500m of offset site where possible).	Feb-Apr, Sep-Nov	-	-	Land Owner or ecological restoration contractor	No ground disturbance by pest animals within offset site. No active rabbit warrens present within offset site, minimal surface harbour for rabbits and hares present (but excluding natural harbour such as rocks).
1	1.5	1.1	Control all high threat grass / herb weeds before seed set using appropriate methods to ensure a reduction of existing weed levels. Refer to Table 4 for percentage cover of high threat weeds at inception. Eliminate any woody weeds (see Section 3.5.2). Control total cover of weeds, in particular perennial grassy weeds and broadleaf weeds. Monitor for new and emerging weeds and eliminate any found.	July-Nov or as required and detailed in the annual works plan	78.288	ha	Land Owner or vegetation management contractor	Minimise the occurrence of weeds, with a reduction in total cover of weeds, including high threat weeds, beyond current levels. Target is a total perennial weed cover of no more than 2% with reduced cover of high threat weeds listed in Table 4, <1% perennial grassy weeds and no more than 2% broadleaf weeds by the end of 10 years. Minimum off-target damage. Control new and emerging weeds to < 1% cover across offset areas.
1	1.6	1.1	If required, develop burn plan and undertake ecological burn of the offset site to reduce plant biomass and promote recruitment of native species. Conduct burns in different seasons to	Sep-Oct (or as specified in the burn plan)	50	ha	Qualified contractor in consultation with CFA and MSC	Medium intensity burn over 20-30% of the 133 ha area. Some small areas within burn boundary left unburnt. No area to be burnt at a

Year number	Action No	Required preceding action*	Activity Description	Timing of activity - month(s)	Quantity	Units	Who is responsible for this action?	Standard to be achieved
			promote regeneration of a variety of species.					frequency of more than once every two years. Follow up weed control will be undertaken within the burn area in accordance with section 3.5. Burns must also be undertaken to generate a mosaic pattern of burnt and unburnt areas (See section 3.5.4.)
1	1.7	0.4	Conduct regular site inspections at a frequency to ensure management activities are conducted as required. This will incorporate identification of any new weeds and evaluation of biomass conditions. These inspections will be conducted by the land owner and/or Ecological Consultant.	Site inspections at an appropriate frequency	-	-	Land Owner and/or Ecological Consultant	Reporting of management activities as agreed. This can consist of a series of notes of observations made by the land owner during site inspections.
1	1.8	0.4	Qualified ecologist to undertake monitoring, and refine management actions based on results. Identify any new high threat weeds for priority control. Report to regulator as required.	Oct-Nov monitoring Dec Reporting	1	Report	Qualified ecologist to be engaged by the Land Owner	Prepare standard report including results from photos and agreed performance measures outlined in Section 3.5. Monitoring report provided to MSC and APAM.

Year number	Action No	Required preceding action*	Activity Description	Timing of activity - month(s)	Quantity	Units	Who is responsible for this action?	Standard to be achieved
1	1.9	1.7	Prepare annual report based on site inspections conducted throughout the year. Report to be provided to MSC and APAM.	Dec, to allow input of independent report above	1	Report	Land Owner	Report reviewing the success of management and level of implementation of OMP provided to MSC and APAM.
1	1.10	1.8-1.9	Review and update Annual Works Plan in consultation with qualified ecologist.	Dec	1	Report	Land owner in consultation with qualified ecologist	Following year's management tailored to current site conditions.

Year number	Action No	Required preceding action*	Activity Description	Timing of activity - month(s)	Quantity	Units	Who is responsible for this action?	Standard to be achieved
Recurrent Activities								
2-10	X.1	1.2	Maintain fences and gates around broader offset area and markers around offset site in good working order.	Continuous (inspection and management)	-	-	Land Owner	Potential threats (i.e. rabbits, domestic stock, unauthorised entry) excluded.
2-10	X.2	1.3	Undertake pulse grazing to reduce biomass. A minimum of three pulse grazing cycles are required within the grazing period, and one of these will occur immediately before the exclusion period (unless otherwise advised by the fire management plan). The maximum grazing length at any one time is four weeks with a minimum two week rest period between grazing cycles. Vegetation cover will not be grazed below 50% and inter-tussock space will be maintained to at least 30%.	16 th January – 31 st July	132.99	ha	Land Owner	Maintain an open tussock grassland with at least 30% cover of inter-tussock space.
2-10	X.3	1.4	Control pest animals (e.g. rabbits, hares, foxes and cats) within the offset and surrounding area (within 500m of offset site where possible).	Feb-Apr, Sep-Nov	-	-	Land Owner or ecological restoration contractor	No ground disturbance by pest animals within offset site. No active rabbit warrens present within offset site, minimal surface harbour for rabbits and hares present (but excluding natural harbour such as rocks).

Year number	Action No	Required preceding action*	Activity Description	Timing of activity - month(s)	Quantity	Units	Who is responsible for this action?	Standard to be achieved
2-10	X.4	1.5	Control all high threat grass / herb weeds before seed set using appropriate methods to ensure a reduction of existing weed levels. Refer to Table 4 for percentage cover of high threat weeds at inception. Eliminate any woody weeds (see Section 3.5.2). Control total cover of weeds, in particular perennial grassy weeds and broadleaf weeds. Monitor for new and emerging weeds and eliminate any found.	July–Nov or as required and detailed in the annual works plan	78.288	ha	Land Owner or vegetation management contractor	Minimise the occurrence of weeds, with a reduction in total cover of weeds, including high threat weeds, beyond current levels. Target is a total perennial weed cover of no more than 2% with reduced cover of high threat weeds listed in Table 4, <1% perennial grassy weeds and no more than 2% broadleaf weeds by the end of 10 years. Minimum off-target damage. Control new and emerging weeds to < 1% cover across offset areas.
2-10	X.5	1.9	Undertake regular site inspections at a frequency to ensure management activities are conducted as required. This will incorporate identification of any new weeds and evaluation of biomass conditions. These inspections will be conducted by the land owner.	Site inspections at an appropriate frequency	-	-	Land Owner, Ecological Consultant and/or MSC	Reporting of management activities as agreed. This can consist of a series of notes of observations made by the land owner during site inspections.
2-10	X.6	2.5	Prepare annual report based on site inspections conducted throughout the year. Report to be provided to MSC and APAM.	Dec	1	Report	Land Owner	Report reviewing the success of management and level of implementation of OMP provided to MSC and APAM.

Year number	Action No	Required preceding action*	Activity Description	Timing of activity - month(s)	Quantity	Units	Who is responsible for this action?	Standard to be achieved
2-9	X.7	2.6	Review and update Annual Works Plan in consultation with qualified ecologist.	Dec	1	Report	Qualified ecologist and land owner	Following years management tailored to current site conditions

Year number	Action No	Required preceding action*	Activity Description	Timing of activity - month(s)	Quantity	Units	Who is responsible for this action?	Standard to be achieved
Year Specific Activities								
3, 5 & 10	X.8	1.8	Qualified ecologist to undertake monitoring, and refine management actions based on results. Report to regulator as required.	Oct-Nov monitoring Dec Reporting	1	Report	Qualified ecologist to be engaged by the Land Owner	Prepare standard report including results from photos and agreed performance measures outlined in Section 3.5. Monitoring report provided to MSC and APAM.
4, 7 & 10	4.8, 7.8 & 10.9	1.6	If possible, develop burn plan and undertake ecological burn of the offset site to reduce plant biomass and promote recruitment of native species. Ecological burns to be undertaken over 40-50% of the offset area at least four times during 10 year management period (e.g. years 1, 4, 7 and 10). Conduct burns in different seasons to promote regeneration of a variety of species.	Mar-Apr (or as specified in the burn plan)	50	ha	Qualified contractor in consultation with CFA and MSC	Medium intensity burn over 40-50% of the 133 ha area. Some small areas within burn boundary left unburnt. No area to be burnt at a frequency of more than once every two years. Follow up weed control will be undertaken within the burn area in accordance with section 1.5. Burns must also be undertaken to generate a mosaic pattern of burnt and unburnt areas (See section 3.5.4.)
10	10.10	10.8	Revise this OMP in consultation with MSC to identify management actions required to maintain the offset site in perpetuity.	Dec	1	OMP	Supervising Ecologist	Updated OMP to aid ongoing maintenance of the offset site.

Year number	Action No	Required preceding action*	Activity Description	Timing of activity - month(s)	Quantity	Units	Who is responsible for this action?	Standard to be achieved
10	10.11	10.9	Identify and allocate resources for ongoing management and continue to implement active ecological management to maintain the offset site.	Dec			Land Manager in consultation with MSC	Ongoing ecological management to maintain and improve the ecological values of the Protection Site in perpetuity.
Beyond Year 10								
Beyond year 10			Maintain fences and gates around broader offset area in good working order.	Continuous (inspection and management)	-	-	Land Owner	Potential threats (i.e. rabbits, domestic stock, unauthorised entry) excluded.
Beyond year 10			Evaluate ground cover biomass and manage using pulse grazing and ecological burning	As required	132.99	ha	Land owner	Maintain an open tussock grassland structure (30% inter-tussock spacing) using fire and pulse grazing, and ensure areas with high levels of dead weeds are subject to biomass reduction.
Beyond year 10			Control pest animals (e.g. rabbits, hares, foxes and cats) within the offset and surrounding area.	Feb – Apr, Sept – Nov	-	-	Land Owner	Absence of evidence of grazing/browsing by pest animals.
Beyond year 10			Control all high threat grass / herb weeds before seed set using appropriate methods to ensure existing weed levels, at the minimum, do not increase. Eliminate all woody weeds.	July - Nov	78.288	ha	Land Owner	Minimise the occurrence of weeds, with no increase in cover of weeds, including high threat weeds, beyond current levels. Minimum off-target damage. Control new and emerging weeds to < 1% cover across offset areas.

Year number	Action No	Required preceding action*	Activity Description	Timing of activity - month(s)	Quantity	Units	Who is responsible for this action?	Standard to be achieved
			Control total cover of weeds, in particular perennial grassy weeds and broadleaf weeds. Monitor for new and emerging weeds and eliminate any found.					
Beyond year 10			Undertake monitoring and refine management actions based on results. Identify any new high threat weeds for priority control. Conduct regular site inspections at a frequency to ensure management activities are conducted as required. These inspections will be conducted by the land owner.	Oct-Nov monitoring Site inspections at an appropriate frequency			Land Owner	Land Owner to undertake monitoring as required and site inspections biannually (at a minimum).

3.6 Monitoring and Reporting

The offset site requires a review of the management actions by a qualified ecologist after years 1, 3, 5 and 10 of management. Baseline data will be collected prior to the commencement of management works and data on the selected parameters will be collected during each of the four reviews. The results of these audits will be reported to MSC and APAM. A template for this reporting is provided in Appendix 4 which includes a requirement to assess the implementation of actions defined by Table 6. The collection of baseline data (Table 6 Action 0.5) at the start of the offset management period will also be used to document the progress of the implementation of this OMP. Information from these monitoring events will be used to guide the ongoing site management.

After the 10 year review, the offset site will continue to be managed by the land owner in a manner consistent with the objectives of this plan.

More general supervision/monitoring of the grassland will be undertaken by an independent ecologist to ensure the grasslands response to management actions produce the desired outcome outlined by this plan. The independent ecologist will visit the site a minimum of four times over the 10 year management period (at least the spring of years 1, 3, 5 and 10) and will liaise with the land owner annually regarding the development of an annual works plan.

The progress of management works will be monitored by the land owner on a regular basis. The land owner will provide a management progress report to MSC and APAM as required on an annual basis.

Actions

- Engage a qualified ecologist to undertake monitoring of management at the commencement of the offset management period (to provide baseline data) and in years 1, 3, 5 and 10. Reports will be provided after years 1, 3, 5 and 10 to APAM and MSC and will include a review of past works and future planning.
- A minimum of twenty (20) permanent photo points will be established by the ecologist and landowner marked and accurately located by GPS or similar within the offset areas. Photo points will be located to adequately characterise the current vegetation condition, and include a range of weed species. These photo points will be used to monitor the vegetation for at least the 10 year period covered by this plan.
- Within a 5 x 5 m area centred on each photo point the ecologist will assess the percentage total vegetation cover, percentage cover of inter-tussock space, average height of vegetation and cover of native and exotic life-forms will be recorded.
- The results of the current year's management actions in relation to the annual management objectives will be reviewed by 31 December each year in consultation with the independent ecologist. This requires regular site inspection to determine the progress of pest plant and animal control works. Short inspections by the land owner to monitor management progress will be completed at least every two months.
- An annual management review will inform the annual works program. This works program will be prepared by the land owner in consultation with the qualified ecologist by the end of December each year. The plan will be implemented by the land owner and will include achievable management objectives consistent with this management plan. The works program for the coming year will also address issues that may not have been anticipated in formulating this original management plan.
- Annual progress reports will be prepared by the land owner.
- Appropriate records must be kept for each monitoring event by the land holder, the nominated ecologist and provided to MSC (date, time, location, description of features or actions within each photograph).

3.7 Timing

The time frame of the OMP is 10 years from commencement of management works. Ecological improvements including the control of pest plants and animals are required to be achieved over this 10 year period. The formal commencement of the 10 year management period must start when the offset area has been legally protected.

Reports prepared by a suitably qualified ecologist will be provided after years 1, 3, 5 and 10 to MSC and APAM and will include a review of past works and future planning.

The land owner will provide a report on the status of management works to MSC and APAM on an annual basis.

Prior to works being undertaken each year the annual works program (based on Table 6) will be reviewed. The person undertaking the works will prepare a detailed works program in consultation with an independent ecologist. The works program for the coming year will also address issues that may not have been anticipated in formulating this original management plan.

This OMP will be periodically reviewed during the 10 year management period and modified if necessary. It is suggested that a review of this plan be incorporated in the reporting requirements for years 1, 3, 5 and 10.

References

- Biosis 2016. *Melbourne Airport Taxiway Zulu and Northern Compound: Biodiversity Assessment*. Report to Australia Pacific Airports Melbourne. Authors: Mueck, S. & Gilmore, D. Biosis Pty Ltd, Melbourne, Project no. 21367.
- Biosis 2017. *Tiverton vegetation mapping 2016/2017*. Report to Tiverton Property Partnering. Author S. Mueck. Biosis Pty Ltd, Melbourne, Project no. 23044.
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- DSE 2009. *BushBroker: Standards for management – Ecological grazing: Information Sheet No. 13*. DSE, East Melbourne.
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- DSEWPaC 2012. Environment Protection and Biodiversity Conservation Act 1999 *Environmental Offsets Policy*. Department of Sustainability, Environment, Water, Population & Communities. Australian Government, Canberra.

Appendices

Appendix 1: EPBC Act Offset Calculator Output

Offsets Assessment Guide

For use in determining offsets under the *Environment Protection and Biodiversity Conservation Act 1999*
2 October 2012

This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	NTGVVP
EPBC Act status	Critically Endangered
Annual probability of extinction Based on IUCN category definitions	6.8%

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator						
Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
<i>Ecological communities</i>						
Area of community	Yes	Site remnants Taxiway Zulu and Northern Compound	Area	18.91	Hectares	site survey
			Quality	4	Scale 0-10	
			Total quantum of impact	7.57	Adjusted hectares	
<i>Threatened species habitat</i>						
Area of habitat	No		Area			
			Quality			
			Total quantum of impact	0.00		
<i>Threatened species</i>						
Protected matter attributes						
Number of features e.g. Nest hollows, habitat trees						
Condition of habitat Change in habitat condition, but no change in extent						
Birth rate e.g. Change in nest success						
Mortality rate e.g. Change in number of road kills per year						
Number of individuals e.g. Individual plants/animals						

Offset calculator																			
Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start area and quality	Future area and quality without offset	Future area and quality with offset	Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source			
<i>Ecological Communities</i>																			
Area of community	Yes	7.57	Adjusted hectares	17.322	Risk-related time horizon (max. 20 years)	20	Start area (hectares)	17.322	Risk of loss (%) without offset	50%	Risk of loss (%) with offset	5%	7.79	80%	6.24	1.67	1.55	20.54%	No
					Future area without offset (adjusted hectares)	8.7	Future area with offset (adjusted hectares)	16.5	2.00	80%	1.60	0.83							
					Time until ecological benefit	10	Start quality (scale of 0-10)	4	Future quality without offset (scale of 0-10)	3	Future quality with offset (scale of 0-10)	5							
<i>Threatened species habitat</i>																			
Area of habitat	Yes		Adjusted hectares		Time over which loss is averted (max. 20 years)		Start area (hectares)		Risk of loss (%) without offset		Risk of loss (%) with offset		0.00		0.00	0.00	0.00	#DIV/0!	#DIV/0!
					Future area without offset (adjusted hectares)	0.0	Future area with offset (adjusted hectares)	0.0	0.00		0.00	0.00							
					Time until ecological benefit		Start quality (scale of 0-10)		Future quality without offset (scale of 0-10)		Future quality with offset (scale of 0-10)								
<i>Threatened species</i>																			
Protected matter attributes																			
Number of features e.g. Nest hollows, habitat trees																			
Condition of habitat Change in habitat condition, but no change in extent																			
Birth rate e.g. Change in nest success																			
Mortality rate e.g. Change in number of road kills per year																			
Number of individuals e.g. Individual plants/animals																			

Summary							
Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost (\$)		
					Direct offset (\$)	Other compensatory measures (\$)	Total (\$)
Birth rate	0				\$0.00		\$0.00
Mortality rate	0				\$0.00		\$0.00
Number of individuals	0				\$0.00		\$0.00
Number of features	0				\$0.00		\$0.00
Condition of habitat	0				\$0.00		\$0.00
Area of habitat	0	0.00	#DIV/0!	#DIV/0!	\$0.00	#DIV/0!	#DIV/0!
Area of community	7.5652	1.55	20.54%	No	\$0.00	#DIV/0!	#DIV/0!
					\$0.00	#DIV/0!	#DIV/0!

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Annual probability of extinction Based on IUCN category definitions	6.8%

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator						
Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
<i>Ecological communities</i>						
Area of community	Yes	Site remnants Taxiway Zulu and Northern Compound	Area	15.03	Hectares	residual after offsets provided by condition 4
			Quality	4	Scale 0-10	
			Total quantum of impact	6.01	Adjusted hectares	
<i>Threatened species habitat</i>						
Area of habitat	No		Area			
			Quality			
			Total quantum of impact	0.00		
<i>Threatened species</i>						
Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
Number of features e.g. Nest hollows, habitat trees	No					
Condition of habitat Change in habitat condition, but no change in extent	No					
Birth rate e.g. Change in nest success	No					
Mortality rate e.g. Change in number of road kills per year	No					
Number of individuals e.g. Individual plants/animals	No					

Offset calculator																				
Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start area and quality	Future area and quality without offset	Future area and quality with offset	Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source				
<i>Ecological Communities</i>																				
Area of community	Yes	6.01	Adjusted hectares	14.09	Risk-related time horizon (max. 20 years)	20	Start area (hectares)	14.09	Risk of loss (%) without offset	50%	Risk of loss (%) with offset	5%	Raw gain	6.34	Confidence in result (%)	80%	Adjusted gain	5.07	Net present value (adjusted hectares)	1.36
					Future area without offset (adjusted hectares)	7.0	Future area with offset (adjusted hectares)	13.4	Raw gain	2.00	Confidence in result (%)	80%	Adjusted gain	1.60	Net present value (adjusted hectares)	0.83				
					Time until ecological benefit	10	Start quality (scale of 0-10)	5	Future quality without offset (scale of 0-10)	4	Future quality with offset (scale of 0-10)	6	Raw gain	2.00	Confidence in result (%)	80%	Adjusted gain	1.60	Net present value (adjusted hectares)	0.83
<i>Threatened species habitat</i>																				
Area of habitat	Yes		Adjusted hectares		Time over which loss is averted (max. 20 years)		Start area (hectares)		Risk of loss (%) without offset		Risk of loss (%) with offset		Raw gain	0.00	Confidence in result (%)		Adjusted gain	0.00	Net present value (adjusted hectares)	0.00
					Future area without offset (adjusted hectares)	0.0	Future area with offset (adjusted hectares)	0.0	Raw gain	0.00	Confidence in result (%)		Adjusted gain	0.00	Net present value (adjusted hectares)	0.00				
					Time until ecological benefit		Start quality (scale of 0-10)		Future quality without offset (scale of 0-10)		Future quality with offset (scale of 0-10)		Raw gain	0.00	Confidence in result (%)		Adjusted gain	0.00	Net present value (adjusted hectares)	0.00
<i>Threatened species</i>																				
Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start value	Future value without offset	Future value with offset	Raw gain	Confidence in result (%)	Adjusted gain	Net present value	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source				
Number of features e.g. Nest hollows, habitat trees	No																			
Condition of habitat Change in habitat condition, but no change in extent	No																			
Birth rate e.g. Change in nest success	No																			
Mortality rate e.g. Change in number of road kills per year	No																			
Number of individuals e.g. Individual plants/animals	No																			

Summary							
Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost (\$)		
					Direct offset (\$)	Other compensatory measures (\$)	Total (\$)
Birth rate	0				\$0.00		\$0.00
Mortality rate	0				\$0.00		\$0.00
Number of individuals	0				\$0.00		\$0.00
Number of features	0				\$0.00		\$0.00
Condition of habitat	0				\$0.00		\$0.00
Area of habitat	0	0.00	#DIV/0!	#DIV/0!	\$0.00	#DIV/0!	#DIV/0!
Area of community	6.0112	1.40	23.29%	No	\$0.00	#DIV/0!	#DIV/0!
					\$0.00	#DIV/0!	#DIV/0!

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Matter of National Environmental Significance	
Name	NTGVVP
EPBC Act status	Critically Endangered
Annual probability of extinction Based on IUCN category definitions	6.8%

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator						
Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
<i>Ecological communities</i>						
Area of community	Yes	Site remnants Taxiway Zulu and Northern Compound	Area	11.53	Hectares	Residual after offset using condition 4 & 5
			Quality	4	Scale 0-10	
			Total quantum of impact	4.61	Adjusted hectares	
<i>Threatened species habitat</i>						
Area of habitat	No		Area			
			Quality			
			Total quantum of impact	0.00		
<i>Threatened species</i>						
Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact	Units	Information source	
Number of features e.g. Nest hollows, habitat trees	No					
Condition of habitat Change in habitat condition, but no change in extent	No					
Birth rate e.g. Change in nest success	No					
Mortality rate e.g. Change in number of road kills per year	No					
Number of individuals e.g. Individual plants/animals	No					

Offset calculator																			
Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start area and quality	Future area and quality without offset	Future area and quality with offset	Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source			
<i>Ecological Communities</i>																			
Area of community	Yes	4.61	Adjusted hectares	46.495	Risk-related time horizon (max. 20 years)	20	Start area (hectares)	46.495	Risk of loss (% without offset)	50%	Risk of loss (% with offset)	5%	20.92	80%	16.74	4.49	4.62	100.19%	Yes
					Future area without offset (adjusted hectares)	23.2	Future area with offset (adjusted hectares)	44.2	Raw gain	2.00	Confidence in result (%)	80%	Adjusted gain	1.60	Net present value (adjusted hectares)	0.83			
					Time until ecological benefit	10	Start quality (scale of 0-10)	6	Future quality without offset (scale of 0-10)	4	Future quality with offset (scale of 0-10)	6							
<i>Threatened species habitat</i>																			
Area of habitat	Yes		Adjusted hectares		Time over which loss is averted (max. 20 years)		Start area (hectares)		Risk of loss (% without offset)		Risk of loss (% with offset)		0.00		0.00	0.00	0.00	#DIV/0!	#DIV/0!
					Future area without offset (adjusted hectares)	0.0	Future area with offset (adjusted hectares)	0.0	Raw gain	0.00	Confidence in result (%)		Adjusted gain	0.00	Net present value (adjusted hectares)	0.00			
					Time until ecological benefit		Start quality (scale of 0-10)		Future quality without offset (scale of 0-10)		Future quality with offset (scale of 0-10)								
<i>Threatened species</i>																			
Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start value	Future value without offset	Future value with offset	Raw gain	Confidence in result (%)	Adjusted gain	Net present value	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source			
Number of features e.g. Nest hollows, habitat trees	No																		
Condition of habitat Change in habitat condition, but no change in extent	No																		
Birth rate e.g. Change in nest success	No																		
Mortality rate e.g. Change in number of road kills per year	No																		
Number of individuals e.g. Individual plants/animals	No																		

Summary							
Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost (\$)		
					Direct offset (\$)	Other compensatory measures (\$)	Total (\$)
Birth rate	0				\$0.00		\$0.00
Mortality rate	0				\$0.00		\$0.00
Number of individuals	0				\$0.00		\$0.00
Number of features	0				\$0.00		\$0.00
Condition of habitat	0				\$0.00		\$0.00
Area of habitat	0	0.00	#DIV/0!	#DIV/0!	\$0.00	#DIV/0!	#DIV/0!
Area of community	4.612	4.62	100.19%	Yes	\$0.00	N/A	\$0.00
					\$0.00	#DIV/0!	#DIV/0!

Appendix 2: Plant Species at Tiverton

A2.1 Plant species recorded within Lot 1 TP379232, parts of 82\PP3580 and Lots 2 & 3 TP238886, Terrinallum

Rare or threatened species status:

Victorian status: (VBA, 2017)

v	vulnerable
r	rare

Noxious weed status:

RC	Regionally controlled species
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Status	Total % cover	Scientific Name	Common Name
Rare or Threatened Native Species			
r		<i>Asperula wimmerana</i>	Wimmera Woodruff
v		<i>Coronidium gunnianum</i>	Pale Swamp Everlasting
r		<i>Geranium</i> sp. 3	Pale-flower Crane's-bill
v		<i>Microseris scapigera</i>	Plains Yam-daisy
Native Species			
		<i>Acaena echinata</i>	Sheep's Burr
		<i>Amphibromus nervosus</i>	Common Swamp Wallaby-grass
		<i>Anthosachne scabra</i>	Common Wheat-grass
		<i>Arthropodium minus</i>	Small Vanilla-lily
		<i>Asperula conferta</i>	Common Woodruff
		<i>Austrostipa bigeniculata</i>	Kneed Spear-grass
		<i>Austrostipa mollis</i>	Supple Spear-grass
		<i>Austrostipa scabra</i> subsp. <i>scabra</i>	Rough Spear-grass
		<i>Bursaria spinosa</i> subsp. <i>spinosa</i>	Sweet Bursaria
		<i>Calocephalus citreus</i>	Lemon Beauty-heads
		<i>Carex inversa</i>	Knob Sedge
		<i>Chrysocephalum apiculatum</i>	Common Everlasting
		<i>Convolvulus angustissimus</i>	Blushing Bindweed

Status	Total % cover	Scientific Name	Common Name
		<i>Crassula decumbens</i> var. <i>decumbens</i>	Spreading Crassula
		<i>Crassula sieberiana</i>	Sieber Crassula
		<i>Cynoglossum suaveolens</i>	Sweet Hound's-tongue
		<i>Dichondra repens</i>	Kidney-weed
		<i>Einadia nutans</i>	Nodding Saltbush
		<i>Eleocharis acuta</i>	Common Spike-sedge
		<i>Eleocharis pusilla</i>	Small Spike-sedge
		<i>Epilobium billardierianum</i>	Variable Willow-herb
		<i>Epilobium hirtigerum</i>	Hairy Willow-herb
		<i>Eryngium ovinum</i>	Blue Devil
		<i>Eryngium vesiculosum</i>	Prickfoot
		<i>Euchiton involucratus</i>	Star Cudweed
		<i>Geranium retrorsum</i>	Grassland Crane's-bill
		<i>Glyceria australis</i>	Australian Sweet-grass
		<i>Glycine clandestina</i>	Twining Glycine
		<i>Isolepis cernua</i> var. <i>platycarpa</i>	Broad-fruit Club-sedge
		<i>Juncus amabilis</i>	Hollow Rush
		<i>Juncus australis</i>	Austral Rush
		<i>Juncus bufonius</i>	Toad Rush
		<i>Juncus flavidus</i>	Gold Rush
		<i>Juncus holoschoenus</i>	Joint-leaf Rush
		<i>Juncus subsecundus</i>	Finger Rush
		<i>Lachnagrostis filiformis</i>	Common Blown-grass
		<i>Lobelia irrigua</i>	Salt Pratia
		<i>Lythrum hyssopifolia</i>	Small Loosestrife
		<i>Melicytus</i> sp. aff. <i>dentatus</i> (Volcanic Plain)	Tangled Shrub-violet
		<i>Microlaena stipoides</i> var. <i>stipoides</i>	Weeping Grass
		<i>Oxalis perennans</i>	Grassland Wood-sorrel
		<i>Persicaria prostrata</i>	Creeping Knotweed

Status	Total % cover	Scientific Name	Common Name
		<i>Poa labillardierei</i> var. <i>labillardierei</i>	Common Tussock-grass
		<i>Poa rodwayi</i>	Velvet Tussock-grass
		<i>Rumex brownii</i>	Slender Dock
		<i>Rumex dumosus</i>	Wiry Dock
		<i>Rytidosperma caespitosum</i>	Common Wallaby-grass
		<i>Rytidosperma duttonianum</i>	Brown-back Wallaby-grass
		<i>Rytidosperma erianthum</i>	Hill Wallaby-grass
		<i>Rytidosperma fulvum</i>	Copper-awned Wallaby-grass
		<i>Rytidosperma geniculatum</i>	Kneed Wallaby-grass
		<i>Rytidosperma laeve</i>	Smooth Wallaby-grass
		<i>Rytidosperma setaceum</i>	Bristly Wallaby-grass
		<i>Schoenus apogon</i>	Common Bog-sedge
		<i>Themeda triandra</i>	Kangaroo Grass
		<i>Wahlenbergia communis</i>	Tufted Bluebell
		<i>Wahlenbergia luteola</i>	Bronze Bluebell
		<i>Walwhalleya proluta</i>	Rigid Panic
Weed Species			
	1	<i>Acetosella vulgaris</i>	Sheep Sorrel
	2	<i>Agrostis capillaris</i>	Browntop Bent
	<1	<i>Aira cupaniana</i>	Quicksilver Grass
	<1	<i>Aira elegantissima</i>	Delicate Hair-grass
	<1	<i>Arctotheca calendula</i>	Cape Weed
	2	<i>Avena barbata</i>	Bearded Oat
	2	<i>Briza maxima</i>	Large Quaking-grass
	<1	<i>Bromus diandrus</i>	Great Brome
	10	<i>Bromus hordeaceus</i> subsp. <i>hordeaceus</i>	Soft Brome
	<1	<i>Carduus pycnocephalus</i>	Slender Thistle
	<1	<i>Cerastium glomeratum</i>	Sticky Mouse-ear Chickweed
	<1	<i>Cirsium vulgare</i>	Spear Thistle

Status	Total % cover	Scientific Name	Common Name
	<1	<i>Conyza bonariensis</i>	Flaxleaf Fleabane
	2	<i>Cynosurus echinatus</i>	Rough Dog's-tail
	<1	<i>Galium murale</i>	Small Goosegrass
	<1	<i>Helminthotheca echioides</i>	Ox-tongue
	5	<i>Holcus lanatus</i>	Yorkshire Fog
	2	<i>Hordeum hystrix</i>	Mediterranean Barley-grass
	<1	<i>Hypochaeris radicata</i>	Flatweed
	<1	<i>Lactuca serriola</i>	Prickly Lettuce
	1	<i>Leontodon taraxacoides</i> subsp. <i>taraxacoides</i>	Hairy Hawkbit
	2	<i>Lolium perenne</i>	Perennial Rye-grass
	2	<i>Lolium rigidum</i>	Wimmera Rye-grass
	<1	<i>Lysimachia arvensis</i>	Scarlet Pimpernel
	<1	<i>Malva nicaeensis</i>	Mallow of Nice
	<1	<i>Marrubium vulgare</i>	Horehound
	<1	<i>Medicago polymorpha</i>	Burr Medic
	<1	<i>Parentucellia latifolia</i>	Red Bartsia
	<1	<i>Parentucellia viscosa</i>	Yellow Bartsia
	<1	<i>Petrorhagia nanteuilii</i>	Childling Pink
	5	<i>Phalaris aquatica</i>	Toowoomba Canary-grass
	<1	<i>Plantago coronopus</i>	Buck's-horn Plantain
	<1	<i>Polycarpon tetraphyllum</i>	Four-leaved Allseed
	<1	<i>Romulea rosea</i>	Onion Grass
	<1	<i>Rumex conglomeratus</i>	Clustered Dock
	<1	<i>Rumex crispus</i>	Curled Dock
	<1	<i>Salvia verbenaca</i>	Wild Sage
	<1	<i>Silybum marianum</i>	Variegated Thistle
	<1	<i>Sonchus asper</i>	Rough Sow-thistle
	<1	<i>Sonchus oleraceus</i>	Common Sow-thistle
	<1	<i>Trifolium campestre</i> var. <i>campestre</i>	Hop Clover

Status	Total % cover	Scientific Name	Common Name
	<1	<i>Trifolium dubium</i>	Suckling Clover
	<1	<i>Trifolium fragiferum</i> var. <i>fragiferum</i>	Strawberry Clover
	<1	<i>Trifolium glomeratum</i>	Cluster Clover
	<1	<i>Trifolium subterraneum</i>	Subterranean Clover
	5	<i>Vulpia bromoides</i>	Squirrel-tail Fescue

Appendix 3: Habitat Scores for NTGVVP in the offset site

EPBC Act Community	Site ID	Zone ID	Habitat score	Area (ha)	Understorey	Lack Of Weeds	Recruitment	Organic Litter	Patch Size	Distance To Core	Neighbourhood
NTGVVP & SHWFTLP	1	23	0.446364	0.088	5	6	6	4	8	4	4
NTGVVP & SHWFTLP	1	24	0.446364	0.047	5	6	6	4	8	4	4
NTGVVP	1	26	0.446364	4.034	5	6	6	4	8	4	4
NTGVVP	1	33	0.366364	1.436	5	6	6	4	4	3	1
NTGVVP	1	34	0.366364	2.705	5	6	6	4	4	3	1
NTGVVP	1	35	0.366364	0.043	5	6	6	4	4	3	1
NTGVVP	1	36	0.366364	0.282	5	6	6	4	4	3	1
NTGVVP	1	48	0.446364	0.362	5	6	6	4	8	4	4
NTGVVP	1	49	0.446364	0.173	5	6	6	4	8	4	4
NTGVVP & SHWFTLP	1	56	0.487273	0.165	10	4	6	4	8	4	4
NTGVVP	1	57	0.446364	0.354	5	6	6	4	8	4	4
NTGVVP & SHWFTLP	1	59	0.419091	0.053	5	4	6	4	8	4	4
NTGVVP & SHWFTLP	1	70	0.61	1.511	15	4	10	4	8	4	4
NTGVVP & SHWFTLP	1	71	0.487273	8.403	10	4	6	4	8	4	4
NTGVVP & SHWFTLP	1	72	0.637273	0.665	15	6	10	4	8	4	4
NTGVVP & SHWFTLP	1	73	0.487273	1.585	10	4	6	4	8	4	4
NTGVVP	1	74	0.391818	3.221	5	2	6	4	8	4	4
NTGVVP & SHWFTLP	1	77	0.387273	1.711	10	4	6	4	2	3	1
NTGVVP	1	89	0.582727	0.282	15	6	6	4	8	4	4
NTGVVP & SHWFTLP	1	90	0.387273	1.385	10	4	6	4	2	3	1
NTGVVP	1	91	0.446364	1.410	5	6	6	4	8	4	4
NTGVVP & SHWFTLP	1	96	0.446364	0.017	5	6	6	4	8	4	4

EPBC Act Community	Site ID	Zone ID	Habitat score	Area (ha)	Understorey	Lack Of Weeds	Recruitment	Organic Litter	Patch Size	Distance To Core	Neighbourhood
NTGVVP & SHWFTLP	3	1	0.58	5.377	15	4	6	4	8	4	4
NTGVVP & SHWFTLP	1	92	0.61	18.621	15	4	10	4	8	4	4
NTGVVP & SHWFTLP	2	63	0.637273	0.007	15	6	10	4	8	4	4
NTGVVP & SHWFTLP	2	64	0.637273	12.830	15	6	10	4	8	4	4
NTGVVP & SHWFTLP	2	65	0.637273	0.326	15	6	10	4	8	4	4
NTGVVP & SHWFTLP	1	75	0.475455	3.937	15	4	6	4	4	3	1
NTGVVP & SHWFTLP	1	76	0.555455	6.861	15	4	6	4	8	4	4
NTGVVP	1	28	0.346364	0.396	5	6	6	4	2	3	1
Total Area				78.288 ha							

Appendix 4: Monitoring and Reporting Form

Landowner of offset site	
Location and address of offset site	1316 Darlington - Nerrin Road, Dundonnell
Offset site number (if applicable)	
Offset plan reference number (if applicable)	
Responsible Authority	
Report #	
Signature	
Date	

Please attach a copy of Management Action Table (Table 6) from this Offset Management Plan with information on which actions have been completed for year/s of this reporting period.

Describe specific monitoring results from surveys undertaken, survival rates of revegetation works, fencing work, success of weed and pest animal control work, successful management tools (i.e. techniques used to control weed species, protection of new plants, monitoring techniques etc.) and any problems or issues experienced (i.e. new infestation of weed species, storm damage to fencing etc.).

Provide photographs showing evidence of works.

If any agreed management actions or commitments are incomplete or have not been undertaken in the times specified explain the reasons why and what program of action/s will be undertaken to implement the action. If no action is to be undertaken please explain the reason/s and how the targets specified will be met.