

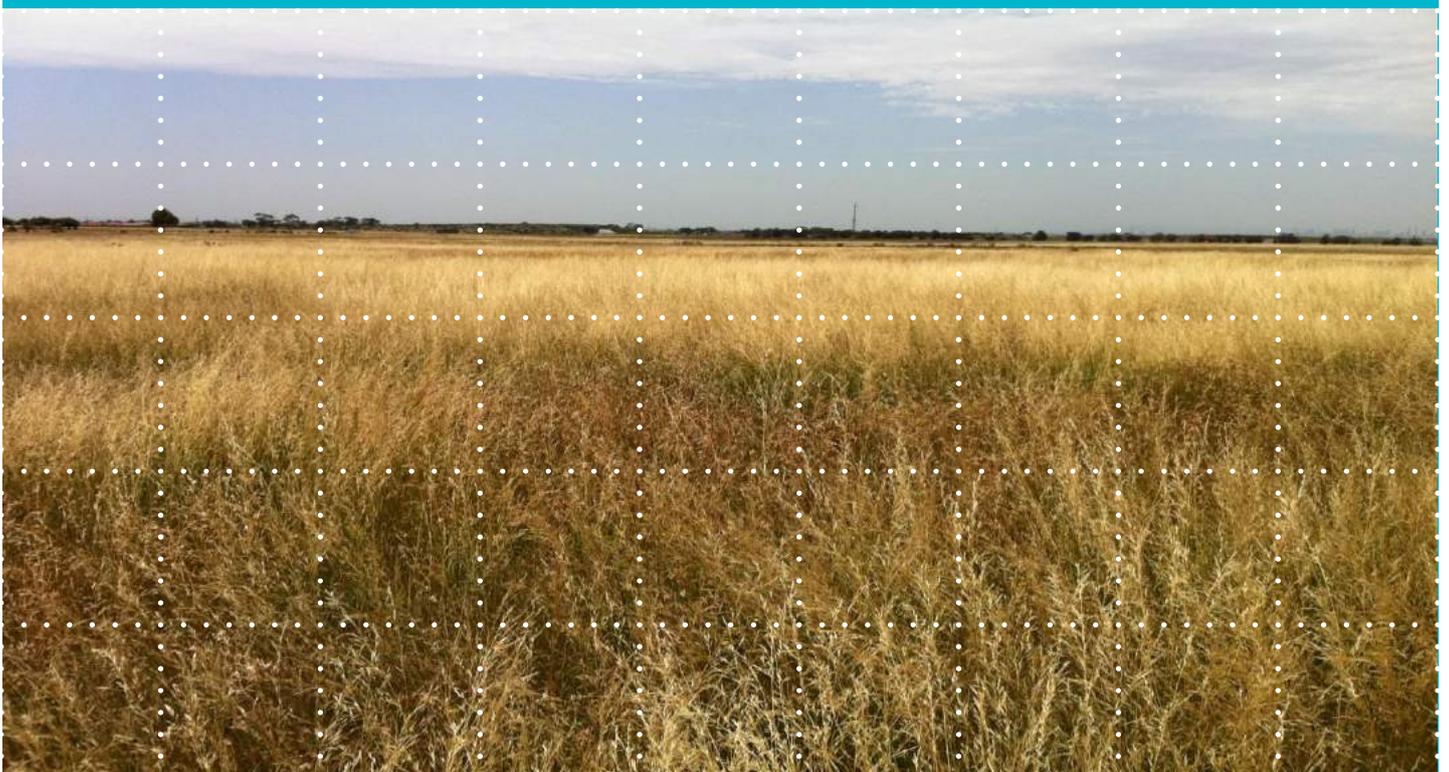
Final Report

Conservation Management Plan: Ravenhall Industrial Precinct, Victoria

Prepared for

Melrose Land Sales Pty Ltd

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Ecology and Heritage Partners Pty Ltd

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GLOSSARY

Acronym	Description
CaLP	<i>Catchment and Land Protection Act 1994</i>
CEMP	Construction Environmental Management Plan
CMA	Catchment Management Authority
CMP	Conservation Management Plan
DELWP	Victorian Department of Environment, Land, Water and Planning
DoE	Federal Department of Environment (former Department of Sustainability, Environment, Water, Population and Communities)
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
EVC	Ecological Vegetation Class
FFG Act	<i>Flora and Fauna Guarantee Act 1988</i>
FIS	Flora Information System
NES	National Environmental Significance
NTG	Natural Temperate Grassland
NTGVVP	Natural Temperate Grassland of the Victorian Volcanic Plain
PMST	Protected Matters Search Tool (DoE)
SLL	Striped Legless Lizard <i>Delmar impar</i>
SRF	Spiny Rice-flower <i>Pimelea spinescens subspecies spinescens</i>
VBA	Victorian Biodiversity Atlas (DEPI)

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1 INTRODUCTION

1.1 Background

Ecology and Heritage Partners Pty Ltd was commissioned by Melrose Land Sales Pty Ltd to develop a Conservation Management Plan (CMP) for a proposed *in-situ* conservation reserve located at Ravenhall Industrial Precinct, Victoria (Figure 1) (EPBC Ref: 2015/7486).

A series of ecological assessments and targeted surveys were undertaken between 2011 and 2012 at Ravenhall Industrial Precinct (Ecology Partners Pty Ltd 2014) with the purpose of identifying ecological implications associated with the development of the study area. The following matters of ecological significance have previously been identified within the study area:

- One fauna species listed as Critically Endangered under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act): Striped Legless Lizard *Delma impar*;
- One nationally significant flora species was recorded: Spiny Rice-flower *Pimelea spinescens* subsp. *spinescens*;
- One nationally listed ecological community listed as Critically Endangered under the EPBC Act: Natural Temperate Grassland of the Victorian Volcanic Plain (NTGVVP).

Areas to be impacted by the proposed development and areas proposed to be retained within the conservation reserve are presented in Figure 2 and summarised in Table 1. The conservation reserve has been specifically designed to retain and protect habitat for Striped Legless Lizard, to avoid significant impacts to Spiny Rice-flower, and to avoid large areas of Natural Temperate Grassland of the Victorian Volcanic Plain (NTGVVP) community. The conservation reserve provides strategic connectivity between designated conservation areas to the immediate south (Ravenhall North Grassland, BCS Conservation Area 6) and west (Deer Park Quarry Grassland, BCS Conservation Area 6) that have been identified as part of the Melbourne Strategic Assessment and the Biodiversity Conservation Strategy, as well as an existing conservation reserve on Christies Road, to the immediate east.

Table 1. Matters of ecological significance to be impacted and retained

Ecological Value	Impacted	Retained	Total	% Retained
Spiny Rice-flower	13	86	99	86.87
Striped Legless Lizard	40.228 ha	28.981 ha	69.209 ha	41.87
NTGVVP	18.015 ha	13.365 ha	31.38 ha	42.59
Arching Flax-lily	1	19	20	95.00
Plains Grassland	34.777 ha	24.390 ha	59.167 ha	41.22
Plains Grassland (Prev. DTV)	1.124 ha	0.012 ha	1.136 ha	1.06
Plains Grassy Wetland	1.853 ha	0.076 ha	1.929 ha	3.94

Note: * up to 13 Spiny Rice-flower plants are likely to be impacted as part of the proposed development. These plants are proposed to be translocated in to the conservation reserve, pending further discussion with DELWP and DoE.

1.2 Study Area

The proposed Ravenhall Industrial Precinct is located in Ravenhall, Victoria, south of the Western Highway, north of the Ballarat train line and west of Christies Road, approximately 21 kilometres west of the Melbourne CBD (Figure 1). For the most part, the study area is relatively flat consisting of both indigenous and exotic grassland vegetation, with areas of intact remnant grassland containing embedded and loose basalt rocks.

The study area is split between three land owners (Melrose Land Sales, Marist Brothers and Giovanni). The Melrose Land Sales property appears to have been predominately used for agricultural purposes, and is currently grazed by horses. There are also signs of old horse tracks within both the Marist Brothers and Giovanni parcels of land.

The majority of the study area is zoned Industrial 3 Zone (IN3Z) with one small section zoned Urban Floodway Zone (UFZ) under the Melton Shire Council Planning Scheme. One overlay, Land Subject to Inundation Overlay – schedule 1 (LSIO 1) applies to the small section which is zoned UFZ.

According to the Department of Environment, Land, Water and Planning (DELWP) Biodiversity Interactive Map (DELWP 2016), the study area occurs within the Victorian Volcanic Plain Bioregion. It is located within the jurisdiction of the Port Phillip and Westernport Catchment Management Authority (CMA) and the Melton Shire Council municipality.

1.3 Objectives

The objective of the CMP is to provide a framework for management of the proposed conservation area in order to maintain and enhance or improve remnant Natural Temperate Grassland of the Victorian Volcanic Plain (NTGVVP) community, along with the viability of Spiny Rice-flower and Striped Legless Lizard populations and their habitat. Specifically, the objectives of the CMP are to:

- Protect remnant NTGVVP community through ongoing habitat management activities and habitat protection;
- Maintain and enhance or improve the viability of Striped Legless Lizard populations through ongoing habitat management activities and habitat protection;
- Protect Spiny Rice-Flower individuals and habitat present within the reserve;
- Provide guidance for the security, improvement and maintenance of Striped Legless Lizard habitat;
- Provide an effective conservation reserve that will maintain and improve the viability of the extant Striped Legless Lizard population, Spiny Rice-flower, and other threatened species; and,
- Have transparent governance arrangements including being able to be readily measured, monitored, audited and enforced.

2 CONSERVATION RESERVE

2.1 Existing Conditions

The conservation reserve supports two Ecological Vegetation Classes (EVCs), Heavier-soils Plains Grassland (EVC 132_61) and Plains Grassy Wetland (EVC 125), as well as areas of predominantly exotic vegetation. Both EVCs present are grass tussock dominated vegetation types, devoid of trees or large shrubs. Plains Grassland typically occupies fertile cracking basalt soils prone to seasonal waterlogging in areas receiving at least 500 mm annual rainfall (DSE 2011). Plains Grassy Wetland is characterised by a ground cover dominated by grasses, and small sedges and herbs. The vegetation is typically species-rich on the outer verges but is usually species-poor in the wetter central areas (DSE 2011). Both EVCs have a conservation significance rating of Endangered. Within the areas of Plains Grassland, one nationally listed ecological community, listed as critically endangered under the EPBC Act, was recorded: Natural Temperate Grassland of Victorian Volcanic Plain (NTGVVP).

2.1.1 Native Vegetation (Grasslands)

2.1.1.1 Vegetation Condition

The field assessment identified large areas of Plains Grassland (Plate 2) within the study area which were consistent with the condition thresholds for NTGVVP, providing a complex and inherently variable ecological community. High quality habitat zones (including PG 4, 7, 17, 20) which are protected by the proposed conservation reserve) contained a high cover of indigenous grass species including Kangaroo Grass *Themeda triandra*, spear grasses *Austrostipa* spp. and wallaby grasses *Rytidosperma* spp., along with a range of indigenous flora species such as Slender Bindweed *Convolvulus angustissimus* subsp. *omnigracilis*, Blue Devil *Erygium ovinum*, Grassland Wood-sorrel *Oxalis perennans*, Sheeps Burr *Acaena echinata*, Ruby Saltbush *Enchylaena tomentosa* var. *tomentosa*, Berry Saltbush *Atriplex semibaccata* and Green Rockfern *Cheilanthes austrotenuifolia* (Figure 2). Areas of lower quality habitat zones, for the most part, have embedded rock removed with negligible soil crust present (if any). Weed cover in lower quality areas was dominated by a variety of exotic species such as Galenia, rye grasses *Lolium* spp., Ribwort *Plantago lanceolata*, Serrated Tussock, Artichoke Thistle *Cynara cardunculus*, Cats Ear *Hypochoeris radicata*, Turnip *Brassica* spp. and Pattersons Curse, as well as many other annual and perennial grass species.

Throughout areas of relatively high quality Plains Grassland vegetation, predominantly in the south-western portion of the study area, several Spiny Rice-flowers were recorded during site surveys (86 individuals retained in the conservation area). In these areas which are protected by the proposed conservation area, the plants were frequently found clustered in groups.

Furthermore, one small patch of Plains Grassy Wetlands was identified within the proposed conservation area during the field assessment. This is largely due to heavy rainfalls across much of Victoria at the time of the field assessment resulting in ephemeral wet areas. Native species in these areas included Common Nardoo *Marsilea drummondii*, Small Loosestrife *Lythrum hyssopifolia*, Common Swamp Wallaby-grass *Amphibromus nervosus*, Common Spike-sedge *Eleocharis acuta*, Finger Rush *Juncus subsecundus* and Rigid Panic *Walwhalleya proluta*. Plains Joyweed *Alternanthera* sp. 1 (Plains) individuals were recorded in areas

of Plains Grassy Wetland which is listed as poorly known under the DELWP Advisory List (DSE 2005). Dominant exotic species included Artichoke Thistle *Cynara cardunculus*, Drain Sedge *Cyperus eragrostis* and Clustered Dock *Rumex conglomeratus*.



Plate 2. Heavier-soils Plains Grassland



Plate 3. Plains Grassy Wetland

2.1.1.2 Fauna Habitat

Native grassland within the study area provide moderate to high value habitat for fauna. This ecological community supports a diversity of animal species including a variety of reptiles, (e.g. lizards, snakes), small mammals, birds of prey and ground dwelling birds (DoE 2016). Included in this is the nationally significant Striped Legless Lizard which has recorded at the study area and immediately adjacent several times. The grassland provides habitat for the lizard and for its prey (spiders, crickets, grasshoppers, lepidopteran larvae and cockroaches). Native grasslands also provide suitable habitat for the Golden Sun Moth (*Synemon plana*), a critically endangered species that feeds on Wallaby-grass tussocks in this community. Although there is a low likelihood that a resident population of the species is present within the study area, the location of the conservation area can act as a refuge area for neighbouring populations in the case of habitat destruction and degradation.

In a regional context, several bird species (including 71 species of birds) occur preferentially in native grassland communities but are not reliant on it for habitat, therefore the grasslands often acts as “stepping stone” habitat for these mobile species.

2.1.2 Predominantly Introduced Vegetation (Grasslands)

2.1.2.1 Vegetation Condition

The remainder of the conservation area consists of predominantly exotic vegetation dispersed throughout existing EVC patches within the conservation reserve. These areas have little or no native vegetation present. These disturbed areas are dominated by exotic grasses, including Serrated Tussock, Chilean Needle-grass and Rye-grasses *Lolium* spp. Exotic herbs such as Galenia, Ribwort and Artichoke Thistle are prevalent with scattered stands of woody weed species including Briar Rose *Rosa rubiginosa* and African Box-thorn *Lycium*

ferocissimum also present. These areas are considered to be in poor condition as they support a large number of introduced grasses and weeds, many of which are highly invasive.

2.1.2.2 Fauna Habitat

This habitat is considered to be of lower habitat value for fauna however it is suitable for grassland dependent species. These areas provide refuge for ground dwelling reptiles, birds and mammals, however few native species are known to use this habitat as their preference. Many bird species have adapted to these modified habitats and native raptors may search for prey items over these areas. Introduced species (Common Starling *Sturnus vulgaris*, House Sparrow *Passer domesticus*) were also prevalent in this habitat during the field assessment.

Although introduced grasses do not provide optimal habitat for fauna, they do provide dispersal opportunities (cover) for reptiles, frogs and other species into more optimal habitats throughout the local area.

2.2 Significant Species

2.2.1 Significant Flora Species

One nationally listed flora species, Spiny Rice-flower, was identified within the study area during the field assessment (Ecology Partners Pty Ltd 2014).

Targeted surveys were undertaken for Spiny Rice-flower and Large-headed Fireweed *Senecio macrocarpus* during late winter, spring and early summer, 2012. Several individual Spiny Rice-flower plants were found within the study area during the targeted surveys with 86 recorded individuals occurring within the proposed conservation area. The plants were frequently found clustered in groups throughout areas of relatively high quality Plains Grassland vegetation. Despite several previous records of Large-headed Fireweed on adjacent land, the species was not identified within the study area during the targeted surveys. These records suggest that whilst the likelihood of Large-headed Fireweed occurrence within the study area is low, it cannot be unequivocally considered absent.

Five State-significant flora species have been recorded within the study area either during the current assessment or during previous assessments. Four species (Arching Flax-lily *Dianella* sp. aff. *longifolia* [Benambra], Slender Bindweed, Plains Joyweed and Rye Beetle-grass *Tripogon loliiformis*) were recorded during current field assessments, while one additional species (Small Scurf-pea *Cullen parvum*) was previously recorded by Biosis Research (2010).

2.2.1.1 Spiny Rice-flower

EPBC Act Conservation Status: Critically Endangered

FFG Act Conservation Status: Listed

DEPI Advisory List: Endangered

Plate 1. Spiny Rice-flower (Ecology and Heritage Partners Pty Ltd)



Spiny Rice-flower *Pimelea spinescens* subsp. *spinescens* is a perennial sub-shrub with spine-tipped stems to 30 centimetres long. Its leaves are opposite, narrowly elliptic to lanceolate and approximately two to 10 millimetres long and one to three millimetres wide. The inflorescence consists of small, dioecious and pale yellow flowers. Spiny Rice-flower flowers between April and August. The fruit is a dry capsule approximately three millimetres long. The species is slow growing and produces a very large tap root that can be up to one metre long. Although plants may live greater than 100 years, they are thought to rarely recruit from seed (Mueck 2000; Carter and Walsh 2006).

The species is typically associated with the *Natural Temperate Grassland of the Victorian Volcanic Plain*, which is listed as a critically endangered ecological community under the EPBC Act (1999) (see EPBC Act Policy Statement 3.8). Spiny Rice-flower plants also occur in the Victorian Midlands and Riverina regions of Victoria. The species is found in a variety of Ecological Vegetation Classes (EVCs), such as Plains Grassland (EVC 132), Plains Grassy Woodland (EVC 55), Plains Woodland (803) and Plains Grassland/Grassy Woodland mosaic (EVC 897). Spiny Rice-flower plants are typically found in undisturbed areas dominated by native grasses, including Kangaroo Grass *Themeda triandra*, and Wallaby-grasses *Rytidosperma* spp.

Spiny Rice-flower plants are endemic to Victoria and are irregularly distributed from central Victoria to the western districts of the State (Walsh and Entwisle 1996; FIS 2013).

The plants are obligate outcrossers, therefore geographic isolation can restrict pollen flow within and among populations. Restricted pollen flow in turn reduces viable seed formation, sexual recruitment, gene flow and overall genetic diversity (Mueck 2000). Poor sexual recruitment means that the majority of plants are mature and that the number of individuals at each site is predicted to decline over time (Mueck 2000).

Early estimates suggested that the total number of Spiny Rice-flower plants stood at less than 12,000 individuals (Carter and Walsh 2006). More recent surveys, however, indicate that there may be up to 55,000 plants scattered throughout 184 known sites (DEWHA 2009). Population sizes are generally small, with approximately 70% of sites containing less than 500 individuals (DEWHA 2009). Furthermore, populations are usually highly fragmented and are often threatened by development, as most plants are not currently reserved but are instead found along roadsides and rail lines.

2.2.2 Significant Fauna Species

One nationally significant fauna species, Striped Legless Lizard, has been regularly recorded within the study area and is assumed to be present (Ecology and Heritage Partners 2014). Previous records were found throughout areas of relatively high quality Plains Grassland vegetation, predominantly the south-western portion of the study area, which is protected by the proposed conservation area.

Targeted surveys for Golden Sun Moth were undertaken throughout the study area on 7, 18 and 31 December 2012 and 7 January 2013. There are multiple records of Golden Sun Moth from the local area (VBA 2010; AVW 2009), predominantly west and south-east of the study area, however the species was not detected *within* the study area during the targeted surveys undertaken in 2009 (Ecology Partners Pty Ltd 2010) and 2012/13 (Ecology and Heritage Partners 2014). This suggests there is a low likelihood that a resident population of the species occurs within the study area.

In addition, other nationally listed fauna species that have the potential to occur (albeit low likelihood) on the site as a rare or vagrant visitor include Growling Grass Frog and Plains Wanderer (Ecology and Heritage Partners 2014). This is due to a large metapopulation present in the local area north of the highway and the suitability of the habitat, respectively.

2.2.2.1 Striped Legless Lizard

EPBC Act Conservation Status: Vulnerable

FFG Act Conservation Status: Threatened

DEPI Advisory List: Endangered

Plate 2. Striped Legless Lizard (Ecology and Heritage Partners Pty Ltd)



The Striped Legless Lizard is a member of the family Pygopodidae, the legless or flap-footed lizards (Cogger 1996). As with other members of the legless lizard family, Striped Legless Lizards lack forelimbs and have only vestigial hind limbs, in the form of scale 'flaps' either side of their vent. Superficially, these animals resemble snakes, but can be readily distinguished from the latter by the presence of external ear openings, a fleshy undivided tongue and a tail which is longer than the body (Cogger 1996). Striped Legless Lizards are readily distinguished from other legless lizards by body colouration, body size and head scalation.

The Striped Legless Lizard typically occurs in native grassland and grassy woodland, often with a mixture of native and exotic perennial and annual species of tussock-forming grasses (DoE 2016). This species prefers areas dominated by Spear Grasses *Austrostipa* spp. and Kangaroo Grass *Themeda triandra*. However, it is also known to occur in areas dominated by introduced species such as *Phalaris aquatica*, Serated Tussock (*Nasella trichotoma*) and *Hypochaeris radicata* (Coulson 1990; Hadden 1995), and at sites with a history of

grazing and pasture improvement. The lizards shelter in grass tussocks, thick ground cover, soil cracks, spider burrows, under rocks and ground debris such as timber.

Prior to European settlement, the Striped Legless Lizard was widespread and relatively continuous throughout its range. Its distribution spread throughout temperate lowland grasslands in the Australian Capital Territory (ACT), the south-western slopes and southern tablelands of New South Wales (NSW), central and southern Victoria, and the south-eastern corner of South Australia (SA) (Cogger et al. 1993). The distribution of the species has declined, with many known sites no longer supporting populations.

The species is threatened by habitat loss, disturbance and fragmentation due to agriculture expansion and urbanisation. Many populations are isolated and fragmented, impeding the ability to disperse, thereby reducing the likelihood of genetic exchange. Such populations are therefore vulnerable as there is little likelihood of recolonisation in the event of a local extinction. Other potential threats include inappropriate burning regimes and feral animals (DoE 2016).

2.2.3 Significant Communities

The critically endangered EPBC Act-listed NTGVVP ecological community is present in the study area and defined by the extent of habitat zone PG1 (Figure 2). In accordance with relevant guidelines (DEWHA 2009; SEWPaC 2011b), the habitat zone meets the following condition thresholds of the EPBC Act-listed NTGVVP:

- At least 50% of perennial native tussock cover consists of *Themeda*, *Austrostipa*, *Poa* and/or *Rytidosperma* (synonym *Austrodanthonia*) genera; and,
- For a native vegetation remnant greater than one (1) hectare in size, the contiguous grassland patch should be at least 0.5 hectares in size.

The area is dominated by Spear-grass and Wallaby-grass, which comprise approximately 60% of the total vegetation cover in the area. The area of NTGVVP is 6.305 hectares in size (Figure 2). Habitat zone PG2 does not meet the condition thresholds for inclusion into the EPBC Act-listed community due to insufficient cover (<50%) of the required plant genera.

Plains Grassland in the study area is also listed as the FFG Act Western (Basalt) Plains Grassland ecological community. The FFG Act community does not have cover and condition thresholds, and all Plains Grassland flora and fauna species are generally considered part of the ecological community.

3 MANAGEMENT PLAN

The following section of the report presents the actions required to implement the management strategy for the grassland conservation area. It is essential to control the spread of weeds and introduced species within this community and bring the ecosystem back to its most natural state to enhance the habitat for the persistence of Striped Legless Lizard, Spiny Rice-flower, and a suite of other native species associated with them.

By maintaining a high value habitat for the species present within the conservation reserve, it can act not only as habitat for the extant population but also as a connecting site between the adjacent conservation areas, as well as a refuge area for neighbouring populations, in the case of habitat destruction and degradation. Furthermore, it can encourage colonisation by other significant species such as Golden Sun Moth which has been recorded in the local area but not at the site specifically.

In combatting introduced grasses and weeds, particularly Chilean Needle-grass and Serrated Tussock, which are highly invasive, it should be recognised that there may be some impact to the NTGVVP community and habitat for Spiny Rice-flower and Striped Legless Lizard. Therefore, it is recommended that management actions must be conducted in a phased approach, whereby only small sections of the conservation reserve are treated at any one time. Adaptive, flexible and to some degree experimental management will therefore play a critical role in the ongoing success of the reserve and the maintenance of the Spiny Rice-flower and Striped Legless Lizard populations.

3.1 Security Arrangements

The proposed conservation reserve will have an on-title legal agreement (e.g. a Section 173 agreement under the *Planning and Environment Act 1987* or equivalent) put in place to ensure it is secured and managed appropriately in perpetuity. The agreement will be implemented and the conservation reserve secured prior to commencement of construction activities associated with the proposed development.

3.2 Management Actions

Management actions described below are to be implemented for a mandatory period of 10 years. Following this period, the responsible authority (or landowner) will continue to manage the conservation reserve after the completion of year 10 as specified in this plan, such that:

- Weed cover is managed in perpetuity to ensure it does not increase beyond the level attained at year 10 of management;
- NTGVVP ecological community is maintained or improved;
- Striped Legless Lizard habitat and population is maintained or improved; and,
- Spiny Rice-flower habitat and population is maintained or improved.

Any proposed uses or development of the site which conflict with the landowners commitments are not permitted under this plan.

3.2.1 Mitigation Measures during Construction

A series of mitigation measures will be implemented during the construction phase of the proposed development to ensure that construction activities do not impact on environmental values present within the reserve or in surrounding areas, and that appropriate environmental protection measures are implemented during construction works. At a minimum, the following measures will be implemented prior to commencement of construction:

- Erect temporary fences surrounding the conservation reserve. The fence will be constructed with minimal impact to the conservation reserve (i.e. no materials or soil stock piling). Particular care must be taken in areas where significant flora species are present, particularly along the southern boundary of the reserve where Spiny Rice-flower and the state listed Arching Flax-lily occur along the fence line. The fence will remain in place for the duration of construction or until replaced by a permanent fence;
- Fencing of the conservation area must be completed and clearly designated as a “No Go Zone”, prior to any construction or development activities reaching within 50 metres of any part of the conservation reserve; and,
- Interpretive and educational signs will be placed around the reserve to highlight the importance of the conservation reserve. Fence and signage condition will be monitored on a weekly basis with any gaps or holes repaired immediately.

In addition to the above, a Construction Environment Management Plan has been prepared to ensure impacts to the conservation reserve during the construction phase are avoided (Ecology and Heritage Partners 2016). The plan includes:

- Environmental site induction to inform contractors of the environmental values present on site and the importance of protecting these areas;
- Fencing and No-Go Zones;
- Dust management;
- Erosion and sedimentation control;
- Pest plant control;
- Waste management;
- Fire management; and,
- Noise management.

3.2.2 Access Control

Without active management and appropriate fencing, unrestricted access into the conservation reserve by vehicles and machinery may result in the loss of native vegetation cover, soil disturbance and compaction, and weed facilitation. As such, permanent fencing will eventually be required to protect the conservation reserve. Access control will proceed in accordance with the following measures:

- Erect permanent fences surrounding the conservation reserve with multiple access gates for maintenance works and emergency access. The fence should be constructed with minimal impact to the conservation reserve (i.e. no materials or soil stock piling);
- Interpretive and educational signs will be placed around the reserve to highlight the importance of the conservation reserve and the significance of NTGVVP, Striped Legless Lizard and Spiny Rice Flower; and,
- Fence and signage condition will be monitored on an annual basis with any gaps or holes repaired immediately.

3.2.3 Biomass Control

Biomass control or reduction is essential for protection against grass fires, and for the maintenance of flora and fauna values. In particular, although both Spiny Rice-flower and Striped Legless Lizard are naturally found in grassy habitats, they both require relatively open structured grassland with inter-tussock spaces and the closure of inter tussock space from a lack of fire or grazing may reduce the areas available for occupancy within the site.

The current biomass reduction method applied throughout the site is grazing by horses. The use of horses is no longer considered suitable or feasible for biomass control in this instance, therefore adaptive management regimes (such as slashing and burning) will be employed to reduce biomass.

Careful consideration will need to be given to all biomass control methods, as management actions must avoid, where possible, impacts to Striped Legless Lizard and Spiny Rice-flower.

- In order to avoid impacting Striped Legless Lizard, it is crucial that any prescribed burns are low-intensity and patchy. Furthermore, prescribed burns should be conducted in early spring (September/October) to avoid summer breeding season, or early autumn (March/April) to avoid removing large areas of vegetation during winter. Where possible, burns should be conducted during the middle of the day or evening rather than early morning when lizards might be cold and slow moving.
- In order to avoid impacting Spiny Rice-flower, any prescribed burns should aim to avoid individual plants and grass length should be monitored around plants to ensure both native and exotic grass species are not limiting the growth of the plant.

With regard to weed control, it is recommended to conduct burning before plants set seed in early spring. In theory, the use of fire also offers greater opportunity for the germination of native grasses and herbs, although it will inevitably also promote germination of weed species. While the promotion of weed seed germination is far from ideal, the process also aids in the exhaustion of the soil seed bank over time.

The following principles should be considered with regard to biomass control:

- Develop a burn plan that includes consideration of nearby properties and landholders and submit for approval by DELWP, Council and the CFA;
- Evaluate the need for biomass control on an annual basis;

- For safety reasons any prescribed burns must be conducted in calm weather conditions only, especially as the subject conservation reserve is linked to larger areas of vegetation in the adjacent conservation reserves identified as part of the Melbourne Strategic Assessment (DSE 2009);
- Conduct any burns in a patchy or mosaic fashion over no more than one third to half the site on any occasion; and,
- Prescribed burns are to be conducted in early spring (September) to avoid the Striped Legless Lizard summer breeding season and before weedy plants set seed.

3.2.4 Weed Control

Large scale weed control activities, such as burning, will be strategically employed in a mosaic fashion to reduce impacts to Striped Legless Lizard and Spiny Rice-flower habitat, in order to gradually replace non-native species with indigenous species, and smaller scale activities, such as manual removal and/or spot spraying will be used throughout the reserve. Other weed control and revegetation/direct seeding activities will aim to target areas of lower quality vegetation, where weed cover is high, to create links between areas of higher quality vegetation and Striped Legless Lizard and Spiny Rice-flower habitat. Information pertaining to revegetation efforts is detailed in Section 3.2.4.1.

The following general guidelines should be taken as basic management principles in regards to weed control:

- Weed control methodology for eradicating graminoid and herbaceous weeds will consist of manual removal and/or spot spraying weeds with an appropriate herbicide. Care should be taken when spraying herbicide to ensure that the poison does not affect native vegetation in the local application area. Weed species should be treated before seed is set, which may involve localised slashing if spot-spraying proves ineffective. A dye should be used in the spray to mark where the spraying has occurred;
- Selective herbicide application is preferable to broad area application but clearly the loss of non-target species needs to be balanced with the threat of incomplete control of the existing weed population;
- Eliminate high threat environmental weeds (cover reduced to <1%) within higher quality vegetation with low weed cover, and controlling high threat environmental weeds within vegetation with medium cover of weeds (cover reduced to <5%);
- Control all other weeds within all habitat zones (cover reduced to <5%);
- Weed control to be conducted outside of the normal active period for Striped Legless Lizard (breeding occurs November to February) and activities conducted in a mosaic fashion to avoid any unexpected impacts affecting the entire population at the same time;
- Any weed control should be done in a manner that minimises soil disturbance;
- Where herbicide application is employed, waterway sensitive products and non-residual herbicides are to be employed;
- Pest plants that reproduce sexually (by seed) are best controlled before seed set. A summary of weed control protocols is provided in Table 2);

- To reduce the amounts of herbicide used, the target biomass should be reduced (e.g. slashed and/or burnt) before application so the herbicide can also be absorbed by the actively regrowing plants. Herbicides are only effective when plants are actively growing; and,
- Weed control works should be monitored regularly to assess their effectiveness, perform follow up works and evaluate the feasibility of management objectives.

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Table 2. Control protocols for key weed species recorded in the study area

Species	Weed Type	Treatment Methods	Timing of Treatment	Desired Outcome
<i>Agrostis capillaris</i> Brown-top Bent	Graminoid	Annual Spraying (before seeding)	Early-mid Spring	C
<i>Anthoxanthum odoratum</i> Sweet Vernal-grass	Graminoid	Annual Spraying (before seeding)	Early-mid Spring	C
<i>Bromus hordeaceus</i> subsp. <i>hordeaceus</i> Soft Brome	Graminoid	Annual Spraying (before seeding)	Early-mid Spring	C
<i>Cirsium vulgare</i> Spear Thistle	Herbaceous	Manual Removal, Annual Spraying (before seeding)	Early-mid Spring	E
<i>Cynara cardunculus</i> Artichoke Thistle	Herbaceous	Manual Removal, Annual Spraying (before seeding)	Early-mid Spring	E
<i>Echium plantagineum</i> Paterson's Curse	Herbaceous	Manual Removal, Annual Spraying (before seeding)	Late winter - mid Spring	C
<i>Foeniculum vulgare</i> Fennel	Herbaceous	Manual Removal, Annual Spraying (before seeding)	Early-mid Spring	C
<i>Hypochoeris radicata</i> Flatweed	Herbaceous	Annual Spraying (before seeding)	Early-mid Spring	C
<i>Lolium perenne</i> Perennial Rye-grass	Graminoid	Annual Spraying (before seeding)	Early-mid Spring	C
<i>Lycium ferocissimum</i> African Boxthorn	Woody	Manual Removal, Spot Spraying, Cut and Paint	Remove before seeding autumn to winter	
<i>Nassella hyalina</i> Cane Needle-grass	Graminoid	Annual Spraying (before seeding)	Early-mid Spring	E
<i>Nassella neesiana</i> Chilean Needle-grass	Graminoid	Annual Spraying (before seeding)	Early-mid Spring	C
<i>Nassella trichotoma</i> Serrated Tussock	Graminoid	Annual Spraying (before seeding)	Early-mid Spring	E
<i>Phalaris aquatica</i> Toowoomba Canary-grass	Graminoid	Annual Spraying (before seeding)	Early-mid Spring	C
<i>Plantago lanceolata</i> Ribwort	Herbaceous	Annual Spraying (before seeding)	Early-mid Spring	C
<i>Romulea rosea</i> Onion Grass	Herbaceous	Annual Spraying (before seeding)	Early-mid Spring	C
<i>Rosa rubiginosa</i> Sweet Briar	Woody	Cut and Paint, Spot Spraying	Late spring - autumn	E
<i>Brassica</i> spp. Turnip	Herbaceous	Manual Removal, Annual Spraying (before seeding)	Early-mid Spring	C
<i>Trifolium</i> spp. Clover	Herbaceous	Annual Spraying (before seeding)	Early-mid Spring	C
<i>Xanthium spinosum</i> Bathurst Burr	Herbaceous	Annual Spraying (before seeding)	Early-mid Spring	C

Notes: C = Control (<5% cover), E = Eliminate (<1% cover)

3.2.4.1 *Revegetation or Supplementary Planting*

The conservation area and surrounds includes occurrences of Serrated Tussock and Chilean Needle Grass, with the highest cover occurring within areas of predominantly exotic vegetation. These species are listed as Weeds of National Significance (WoNS). Striped Legless Lizard is known to occur in grasslands dominated by introduced species, however it is unknown if these ecosystems can support Striped Legless Lizard populations in the long term (DoE 2016). In order to ensure the long term survival of Striped Legless Lizard throughout its distribution, in addition to Spiny Rice-flower, management actions are aimed at restoring natural temperate grasslands to their natural state to provide optimal habitat for Spiny Rice-flower and Striped Legless Lizard, and a diversity of additional threatened species.

As such, the overarching management strategy for these areas is to progressively replace the Chilean Needle-grass and Serrated Tussock with native vegetation consistent with the extant EVC's. Management activities will be conducted in a mosaic fashion, aiming to introduce connectivity to areas of high quality vegetation through revegetation and supplementary planting. Site preparation and revegetation efforts will radiate outwards from each patch with the ultimate aim of uniting all patches throughout the site.

Revegetation and supplementary planting will proceed in accordance with the following aims:

- Areas to be revegetated require at least two years of site preparation before supplementary planting or seeding can commence. Site preparation will include herbicide application on at least four occasions, with the final application in mid-spring prior to the plants setting seed;
- Supplementary planting and revegetation will be undertaken at a rate of up to 10,000 plants per hectare, with the following order of priority:
 1. Areas of low quality vegetation where weed cover is relatively high.
 2. Radiate supplementary planting efforts outward from areas surrounding existing patches to connect areas of high quality vegetation in a mosaic fashion at a collective rate of approximately one hectare per year.
- Revegetation efforts will focus on establishing native grasses to competitively replace pasture grasses and high threat weeds. Key species will include a range of Spear-grasses and Kangaroo Grass that are known to provide suitable habitat and a food source for Striped Legless Lizard. Other grasses may include Red-legged Grass, wallaby grasses. Once a sward of native grasses has been established, revegetation efforts can start to introduce other herbaceous species that contribute to grassland diversity appropriate to the local EVCs (Plains Grassy Woodland and Plains Grassy Wetland);
- Tubestock and seed will be of local provenance with species appropriate to the local EVCs (Plains Grassland and Plains Grassy Wetland); and,
- All management activities will be conducted outside of the active period for Striped Legless Lizard (November to December) and no spraying of herbicides is to occur at least six weeks post incubation period (January to February) to prevent impacts to any Striped Legless Lizard hatchlings that may be present.

Alternative methods to the revegetation strategy provided above may include consideration of broad-scale direct seeding of native grasses. Great advances have been made in the past decade with regard to direct

seedling techniques, effectiveness and comparative costs. While care and consideration will need to be given to Striped Legless Lizard, the conservation site in question offers a great opportunity to experiment with this technique due to the dominance of Chilean Needle-grass and Serrated Tussock across the site, which must eventually be eradicated.

3.2.5 Pest Animal Control

Cats and foxes may predate Striped Legless Lizards, and these two species should be the target of a pest animal control program within the conservation area. Eradication actions (baiting) should occur on a yearly basis for the life of this plan.

European Rabbit *Oryctolagus cuniculus* remain a threat for the regeneration/recruitment of native species within the conservation reserve. All vermin harbour (i.e. burrows) should be removed, without disturbance to native vegetation or significant soil disturbance. The land owner/contractor is to monitor pest animal use of the conservation reserve whilst undertaking vegetation management works. Any changes in the influences of pest animals may require a change in the management actions.

The following key management actions will be undertaken to ensure success of the pest animal program:

- Identify potential harbour and burrows, and destroy if soil disturbance can be minimised and all native vegetation retained;
- Undertake pest animal control program (e.g. baiting, trapping and shooting of foxes, hares, rabbits or feral cats); and,
- Monitor the population of pest animals during weed control works and adapt management as considered appropriate.

3.2.6 Threatened Flora Species

One nationally listed flora species (Spiny Rice-flower) and five state significant flora species (Arching Flax-lily, Slender Bindweed, Plains Joyweed, Rye Beetle-grass, and Small Scurf-pea) have been recorded within the study area either during the current assessment or during previous assessments (Ecology Partners 2010; Biosis Research 2010). Management actions should be undertaken to ensure that; firstly these species are protected, and secondly recruitment or expansion of the species is encouraged. Ongoing management activities need to be aware of these significant species, or any other significant species that may persist on the site. Furthermore, by enhancing NTGVVP community, there will be considerable advantages for the persistence of these significant species.

All workers involved in the control of pest plants and animals must be able to identify the significant plant and animal species present within the study area.

Spiny Rice-flower Salvage and Translocation

Up to 13 Spiny Rice-flower plants are likely to be impacted as part of the proposed development. These plants are proposed to be translocated in to the conservation reserve, pending further discussion with DELWP and DoE. Should this course of action be approved, Spiny Rice-flower salvage and translocation will be undertaken in accordance with the Spiny Rice-flower Translocation Protocol (Pimelea spinescens Recovery Team 2013) and in liaison with the Pimelea spinescens Recovery Team. It is understood that the

translocation protocol is currently under review. As such any salvage and translocation will be in accordance with the most recent document endorsed by the *Pimelea spinescens* Recovery Team.

3.3 Monitoring and Reporting

Monitoring of native vegetation (NTGVVP), Spiny Rice-flower and Striped Legless Lizard habitat by a suitably qualified ecologist should be undertaken to ensure key performance targets are met and the responsible authorities notified of the successes and failures of works through regular progress reports. Progress reports will be provided to the responsible authority at the end of years 2, 5 and 10 of the program (Table 3). Ongoing monitoring will also provide feedback to inform an adaptive management approach, which is critical to tailor management actions to prevailing environmental conditions and also for the provision of contingency plans. For example, if monitoring data suggests that one form of management, such as burning compared to slashing or scraping for direct seeding, appears to be having a detrimental effect, or alternatively a positive effect on localised Spiny Rice-flower and Striped Legless Lizard numbers then management will be adapted accordingly.

3.3.1 Monitoring

3.3.1.1 *Native vegetation*

Monitoring is required to assess the positive and negative impacts of management actions on the integrity of the study area, and to implement change if required. Vegetation monitoring will be conducted twice a year in the first five years, and at the end of this period, updated to be annual or twice a year. Progress reports will be provided to the landowner annually, and to the responsible authority at the end of years 2, 5 and 10 of the program.

This monitoring will be undertaken by a suitably qualified ecologist, with some input from the landowners. However, the frequency of monitoring may need to vary to allow for seasonal variations and to target periods of active weed growth. Similarly, pest animal monitoring should be undertaken at a time of year when these animals are most active so that an accurate assessment of population sizes can be made.

It is recommended that monitoring be undertaken by qualified ecological consultants familiar with the methodology as well as any offset and EPBC Act referral requirements. Monitoring and progress reports should include the following:

- Collection of baseline data to be used as a reference point to assess the impacts of management actions;
- Overall condition and composition of vegetation as well as consideration of Gain outcomes;
- Biomass levels;
- Distribution and abundance of significant flora species;
- The extent, severity, trend and presence of current weed species and any new and emerging weed species; and,
- Implementation of permanent photo points, which will be permanently marked with concrete or star pickets, with individual metal tags. Photographs must be taken at the same location and

direction, and during the same time of each year. The overall percentage of native vegetation and exotic vegetation will be recorded at these points. Photo points will allow monitoring of weed populations and maintenance of the current condition of native vegetation within the offset site. Details of photo points and photographs will be provided to DELWP where required as evidence of progress.

3.3.1.2 *Spiny Rice-flower*

Long-term independent monitoring of the plants within the conservation area is crucial to ensuring ongoing survival of Spiny Rice-flower (Vallee *et al.* 2004). All existing plants in the conservation area must be monitored to compare growth, survival and recruitment. These will be tagged and monitored.

Monitoring at the conservation area will involve the documentation of key threatening processes such as drought stress, the presence of pest plants and animals, biomass and other site disturbances, together with the growth and survival rates of the existing population and new recruits.

Annual monitoring of Spiny Rice-flower populations, as per below, will be undertaken for an initial 4 year period, and then in years 6, 8 and 10 (within the ten year management timeframe). If, at the end of the four year monitoring program, the results indicate a decline in the Spiny Rice-flower population or degradation of Spiny Rice-flower habitat, the CMP will be re-evaluated and adapted accordingly.

Specific survey procedures will follow the survey guidelines for Spiny Rice-flower in the Significant Impact Guidelines for the species (DEWHA 2009). The following will be undertaken as part of population and habitat monitoring of Spiny Rice-flower habitat for the 10 year period (and extended if required):

- Targeted surveys should be done by people familiar with recognising the subspecies.
- Multiple surveys may be required to identify the species and provide adequate survey effort.
- Surveys should not be conducted for at least six months after fires and for at least three months after the cessation of grazing.
- Survey between April and August while flowering (easily overlooked when not in flower).
- The targeted survey effort should be directed to all potential habitat areas i.e. remnant grassland including degraded grassland.
- Walk through transects at less than 5m grid intervals are required for all potential habitat.
- Record the number of plants per land parcel.

If plants perish, the immediate area should be assessed for seed recruitment. All recruits will be tagged and monitored in accordance with the existing population.

Translocated Spiny Rice-flower plants

Up to 13 Spiny Rice-flower plants are likely to be impacted as part of the proposed development. These plants are proposed to be translocated in to the conservation reserve, pending further discussion with DELWP and DoE. Should this course of action be approved, the monitoring of translocated Spiny Rice-flower plants will be in accordance with the Spiny Rice-flower monitoring protocol (Reynolds 2014a, 2014b). It is

understood that the monitoring protocol is currently under review. As such any monitoring will be in accordance with the most recent document endorsed by the Pimelea spinescens Recovery Team.

3.3.1.3 Striped Legless Lizard

Striped Legless Lizard populations are known to vary on spatial and temporal scales depending upon habitat conditions at a particular site. Monitoring is required to determine if Striped Legless Lizard has persisted in grassland areas, to determine reproductive success and to ensure that management actions and habitats are suitable for a viable Striped Legless Lizard population in the future.

Annual monitoring of Striped Legless Lizard populations, as per below, will be undertaken for an initial 4 year period, and then in years 6, 8 and 10 (within the ten year management timeframe). If, at the end of the four year monitoring program, the results indicate a decline in the Striped Legless Lizard population or degradation of Striped Legless Lizard habitat, the CMP will be re-evaluated and adapted accordingly.

The following methodology will be used to determine the population status of the Striped Legless Lizard within the protected area:

- Tile grids of 10 x 5 tiles will be set during winter at a rate of one grid per hectare;
- Tiles will be laid in areas of suitable habitat within tussock grassland or grassy habitat at least three months before the determined survey period to allow 'bedding-in' (i.e. installed by July);
- Tiles will be checked eight times between September and November under suitable conditions (early morning on warm, still days). Other suitable protective structures on site will also be systematically overturned and replaced to actively search for Striped Legless Lizard;
- Time of day, weather conditions and the ambient temperature will be recorded for each grid; and,
- Morphological data including sex, body size and reproductive condition will be recorded for all Striped Legless Lizard captured, as well as dorsal head shots for unique identification purposes.

3.3.1.4 Other Monitoring

Information relating to fencing and signage, weed control and pest animal control will be provided by landowners and the relevant contractors. This information will be included in the progress report, discussed below.

3.3.2 Reporting

Progress reports will be provided to the landowner on an annual basis, and to the responsible authority at the end of years 2, 5 and 10 of the program. Information to be provided in the progress report includes:

- A copy of the Management Actions Table (Table 3) detailing actions completed during the reporting period;
- A description of the specific monitoring results from ecological surveys undertaken for Spiny Rice-flower and Striped Legless Lizard;
- Success of weed and pest animal control work;

- Successful management tools (i.e. techniques used to control weed species, protection of new plants, monitoring technique, etc.);
- Any problems or issues experienced (i.e. new infestation of weed species, etc.);
- Any corrective actions and contingency measures where monitoring indicates that there has been a deterioration in NTGVVP, Spiny Rice-flower or Striped Legless Lizard populations; and,
- Photographs showing evidence of works.

If any agreed management actions or commitments are incomplete or have not been undertaken in the times specified, the contractor is to document the justification and the actions that will be undertaken to implement management requirement.

3.4 Management Actions Table

Management actions are summarised in Table 3. The actions constitute the minimum management requirements for the conservation reserve over the mandatory 10 year management period.

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Table 3. Management Actions Table

Year	Action	Management action	Responsible authority / personnel	Timing of action	Report reference	Date completed
0	0.1	Implement on-title legal agreements for conservation reserve	Liaise between the landowner, DEPI and Council.	Pre-construction	Section 3.1	
0	0.2	Erect temporary fences surrounding the conservation reserve, implement 50 metre buffer zone, install signage	Landowner	Pre-construction	Section 3.2.1	
0	0.3	Acquire baseline monitoring data	Suitably qualified ecological specialist	Pre-construction	Section 3.3.1.1	
0	0.4	Implement CEMP	Landowner	Pre- and during construction	Section 3.2.1	
1	1.1	Erect permanent fences and signage surrounding the conservation reserve	Landowner	Upon completion of construction	Section 3.2.2	
1	1.2	Conduct weed control and implement revegetation plan	Landowner/Bushland Management Contractor	Refer to Table 2	Section 3.2.4	
1	1.3	Monitor populations of pest animals and conduct control works if required	Landowner/Pest Animal Contractor	After peak breeding season - late summer/early autumn	Section 3.2.5	
1	1.4	Conduct monitoring for vegetation, Spiny Rice-flower and Striped Legless Lizard in accordance with the relevant survey guidelines and timing outlined in Section 3.3.1.	Suitably qualified ecological specialist	One year after commencement of works with the appropriate survey effort and timelines	Section 3.3.1	
1	1.5	Monitor organic litter and grass density and develop ecological burn or fuel reduction plan if appropriate	Landowner/Bushland Management Contractor/CFA	Outside of the GSM active season	Section 3.2.3	
2	2.1	Conduct weed control and continue revegetation plan	Landowner/Bushland Management Contractor	Refer to Table 2	Section 3.2.4	
2	2.2	Monitor populations of pest animals and conduct control works if required	Landowner/Pest Animal Contractor	After peak breeding season - late summer/early autumn	Section 3.2.5	
2	2.3	Conduct monitoring for vegetation, Spiny Rice-flower	Suitably qualified ecological specialist	Two years after	Section 3.3.1	

Year	Action	Management action	Responsible authority / personnel	Timing of action	Report reference	Date completed
		and Striped Legless Lizard in accordance with the relevant survey guidelines and timing outlined in Section 3.3.1.		commencement of works with the appropriate survey effort and timelines		
2	2.4	Maintain fences	Landowner/Fencing Contractor	As required	Section 3.2.2	
2	2.5	Monitor organic litter and grass density and enact ecological burn or other approved biomass reduction plan if appropriate	Landowner/Bushland Management Contractor/CFA	Outside of the GSM active season	Section 3.2.3	
2	2.6	Monitor and assess works, and prepare progress report	Suitably qualified ecological specialist	Two years after commencement of works	Section 3.3.2	
3	3.1	Conduct weed control and continue revegetation plan	Landowner/Bushland Management Contractor	Refer to Table 2	Section 3.2.4	
3	3.2	Monitor populations of pest animals and conduct control works if required	Landowner/Pest Animal Contractor	After peak breeding season - late summer/early autumn	Section 3.2.5	
3	3.3	Conduct monitoring for vegetation, Spiny Rice-flower and Striped Legless Lizard in accordance with the relevant survey guidelines and timing outlined in Section 3.3.1.	Suitably qualified ecological specialist	Three years after commencement of works with the appropriate survey effort and timelines	Section 3.3.1	
3	3.4	Maintain fences	Landowner/Fencing Contractor	As required	Section 3.2.2	
3	3.5	Monitor organic litter and grass density and enact ecological burn or other approved biomass reduction plan if appropriate	Landowner/Bushland Management Contractor/CFA	Outside of the GSM active season	Section 3.2.3	
4	4.1	Conduct weed control and continue revegetation plan	Landowner/Bushland Management Contractor	Refer to Table 2	Section 3.2.4	
4	4.2	Monitor populations of pest animals and conduct control works if required	Landowner/Pest Animal Contractor	After peak breeding season - late summer/early autumn	Section 3.2.5	
4	4.3	Conduct monitoring for vegetation, Spiny Rice-flower and Striped Legless Lizard in accordance with the	Suitably qualified ecological specialist	Four years after commencement of works	Section 3.3.1	

Year	Action	Management action	Responsible authority / personnel	Timing of action	Report reference	Date completed
		relevant survey guidelines and timing outlined in Section 3.3.1.		with the appropriate survey effort and timelines		
4	4.4	Maintain fences	Landowner/Fencing Contractor	As required	Section 3.2.2	
4	4.5	Monitor organic litter and grass density and enact ecological burn or other biomass reduction plan if appropriate	Landowner/Bushland Management Contractor/CFA	Outside of the GSM active season	Section 3.2.3	
5	5.1	Conduct weed control and continue revegetation plan	Landowner/Bushland Management Contractor	Refer to Table 2	Section 3.2.4	
5	5.2	Monitor populations of pest animals and conduct control works if required	Landowner/Pest Animal Contractor	After peak breeding season - late summer/early autumn	Section 3.2.5	
5	5.3	Conduct monitoring for vegetation in accordance with the relevant survey guidelines and timing outlined in Section 3.3.1.	Suitably qualified ecological specialist	Five years after commencement of works with the appropriate survey effort and timelines	Section 3.3.1	
5	5.4	Maintain fences	Landowner/Fencing Contractor	As required	Section 3.2.2	
5	5.5	Monitor organic litter and grass density and enact ecological burn or other biomass reduction plan if appropriate	Landowner/Bushland Management Contractor/CFA	Outside of the GSM active season	Section 3.2.3	
5	5.6	Monitor and assess works, and prepare progress report	Suitably qualified ecological specialist	Five years after commencement of works	Section 3.3.2	
6	6.1	Conduct weed control and continue revegetation plan	Landowner/Bushland Management Contractor	Refer to Table 2	Section 3.2.4	
6	6.2	Monitor populations of pest animals and conduct control works if required	Landowner/Pest Animal Contractor	After peak breeding season - late summer/early autumn	Section 3.2.5	
6	6.3	Conduct monitoring for vegetation, Spiny Rice-flower and Striped Legless Lizard in accordance with the relevant survey guidelines and timing outlined in	Suitably qualified ecological specialist	Six years after commencement of works with the appropriate	Section 3.3.1	

Year	Action	Management action	Responsible authority / personnel	Timing of action	Report reference	Date completed
		Section 3.3.1.		survey effort and timelines		
6	6.4	Maintain fences	Landowner/Fencing Contractor	As required	Section 3.2.2	
6	6.5	Monitor organic litter and grass density and enact ecological burn or other biomass reduction plan if appropriate	Landowner/Bushland Management Contractor/CFA	Outside of the GSM active season	Section 3.2.3	
7	7.1	Conduct weed control and continue revegetation plan	Landowner/Bushland Management Contractor	Refer to Table 2	Section 3.2.4	
7	7.2	Monitor populations of pest animals and conduct control works if required	Landowner/Pest Animal Contractor	After peak breeding season - late summer/early autumn	Section 3.2.5	
7	7.3	Conduct monitoring for vegetation in accordance with the relevant survey guidelines and timing outlined in Section 3.3.1.	Suitably qualified ecological specialist	Seven years after commencement of works with the appropriate survey effort and timelines	Section 3.3.1	
7	7.4	Maintain fences	Landowner/Fencing Contractor	As required	Section 3.2.2	
7	7.5	Monitor organic litter and grass density and enact ecological burn or other biomass reduction plan if appropriate	Landowner/Bushland Management Contractor/CFA	Outside of the GSM active season	Section 3.2.3	
8	8.1	Conduct weed control and continue revegetation plan	Landowner/Bushland Management Contractor	Refer to Table 2	Section 3.2.4	
8	8.2	Monitor populations of pest animals and conduct control works if required	Landowner/Pest Animal Contractor	After peak breeding season - late summer/early autumn	Section 3.2.5	
8	8.3	Conduct monitoring for vegetation, Spiny Rice-flower and Striped Legless Lizard in accordance with the relevant survey guidelines and timing outlined in Section 3.3.1.	Suitably qualified ecological specialist	Eight years after commencement of works with the appropriate survey effort and timelines	Section 3.3.1	

Year	Action	Management action	Responsible authority / personnel	Timing of action	Report reference	Date completed
8	8.4	Maintain fences	Landowner/Fencing Contractor	As required	Section 3.2.2	
8	8.5	Monitor organic litter and grass density and enact ecological burn or other biomass reduction plan if appropriate	Landowner/Bushland Contractor/CFA Management	Outside of the GSM active season	Section 3.2.3	
9	9.1	Conduct weed control and continue revegetation plan	Landowner/Bushland Contractor Management	Refer to Table 2	Section 3.2.4	
9	9.2	Monitor populations of pest animals and conduct control works if required	Landowner/Pest Animal Contractor	After peak breeding season - late summer/early autumn	Section 3.2.5	
9	9.3	Conduct monitoring for vegetation in accordance with the relevant survey guidelines and timing outlined in Section 3.3.1.	Suitably qualified ecological specialist	Nine years after commencement of works with the appropriate survey effort and timelines	Section 3.3.1	
9	9.4	Maintain fences	Landowner/Fencing Contractor	As required	Section 3.2.2	
9	9.5	Monitor organic litter and grass density and enact ecological burn or other biomass reduction plan if appropriate	Landowner/Bushland Contractor/CFA Management	Outside of the GSM active season	Section 3.2.3	
10	10.1	Conduct weed control and continue revegetation plan	Landowner/Bushland Contractor Management	Refer to Table 2	Section 3.2.4	
10	10.2	Monitor populations of pest animals and conduct control works if required	Landowner/Pest Animal Contractor	After peak breeding season - late summer/early autumn	Section 3.2.5	
10	10.3	Conduct monitoring for vegetation, Spiny Rice-flower and Striped Legless Lizard in accordance with the relevant survey guidelines and timing outlined in Section 3.3.1.	Suitably qualified ecological specialist	Ten years after commencement of works with the appropriate survey effort and timelines	Section 3.3.1	
10	10.4	Maintain fences	Landowner/Fencing Contractor	As required	Section 3.2.2	
10	10.5	Monitor organic litter and grass density and enact	Landowner/Bushland Contractor Management	Outside of the GSM active	Section 3.2.3	

Year	Action	Management action	Responsible authority / personnel	Timing of action	Report reference	Date completed
		ecological burn or other biomass reduction plan if appropriate	Contractor/CFA	season		
10	10.6	Monitor and assess works, and prepare final report	Suitably qualified ecological specialist	Ten years after commencement of works	Section 3.3.2	

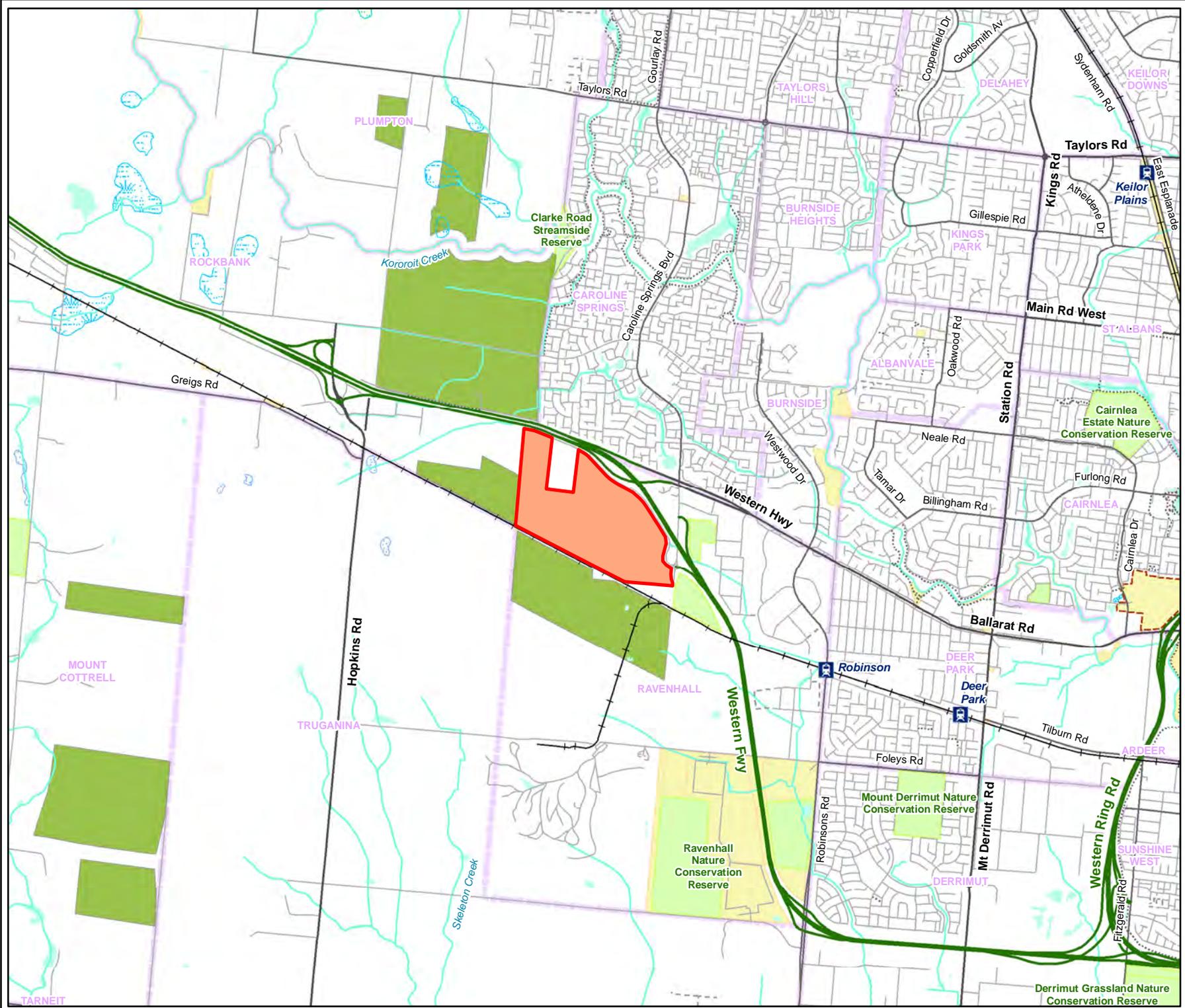
Notes: CFA: Country Fire Authority; CEMP: Construction Environmental Management Plan; SLL: Striped Legless Lizard.

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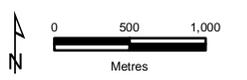
FIGURES



- Legend**
- Study Area
 - Freeway
 - Major Road
 - Collector Road
 - Minor Road
 - Proposed Road
 - Walking Track
 - Minor Watercourse
 - Permanent Waterbody
 - Land Subject to Inundation
 - Wetland/Swamp
 - Conservation Area (Biodiversity Conservation Strategy)
 - Parks and Reserves
 - Crown Land
 - Localities



Figure 1
Location of the study area
Ravenhall



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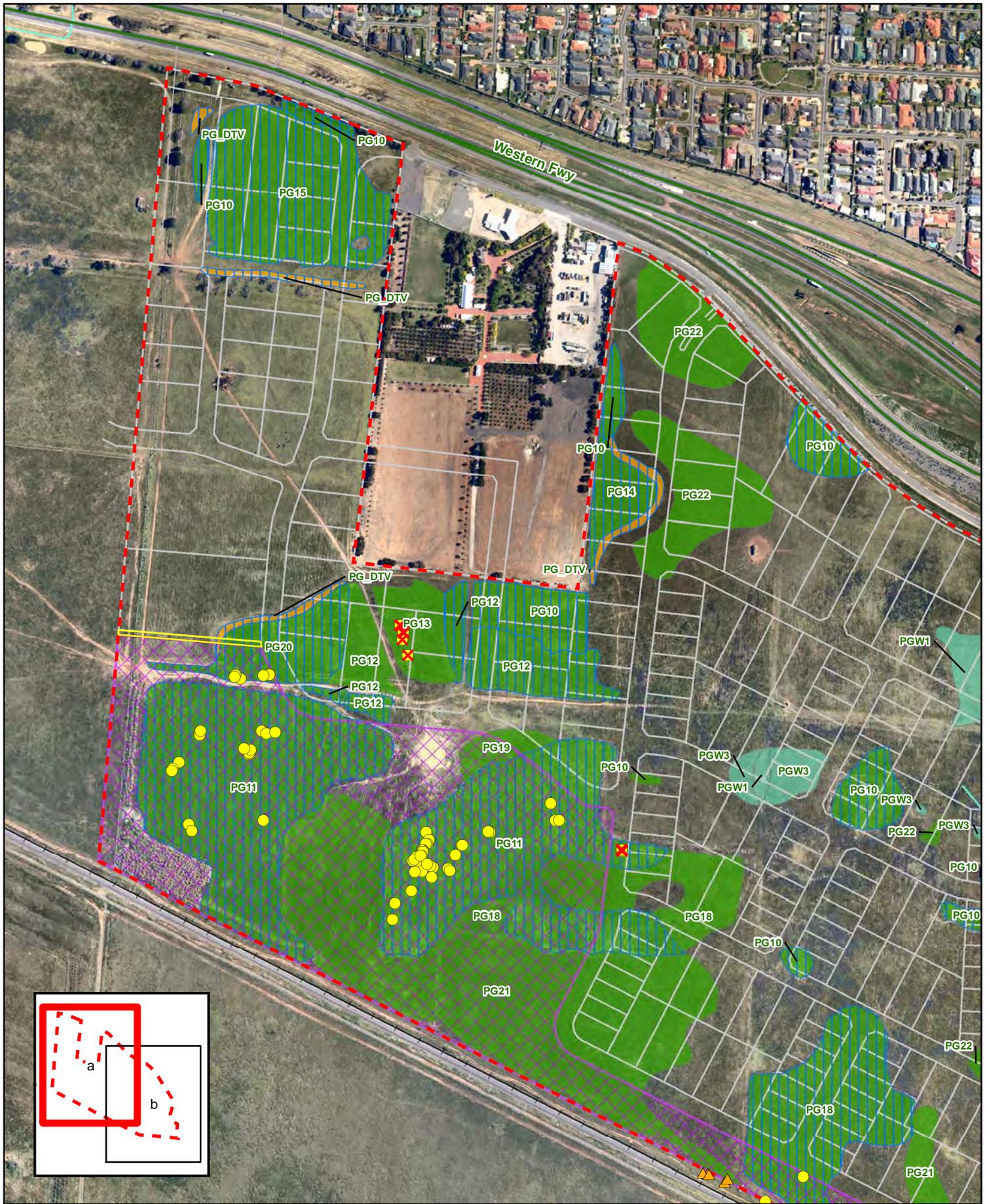
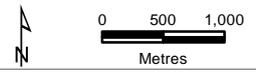


Figure 2a
Proposed development plan and impact on ecological features
Ravenhall

- Study Area
- Proposed reserves (29.72 ha)
- 6m fire buffer
- Vegetation Impacts**
- X Individual plant losses
- Vegetation losses
- Significant fauna**
- Striped Legless Lizard
- Significant flora**
- Spiny Rice-flower
- ▲ Arching Flax-lily
- EPBC Act listed communities**
- Natural Temperate Grassland of the Victorian Volcanic Plain
- Remnant Vegetation**
- Plains Grassland
- Plains Grassland (Prev. DTV)
- Plains Grassy Wetland



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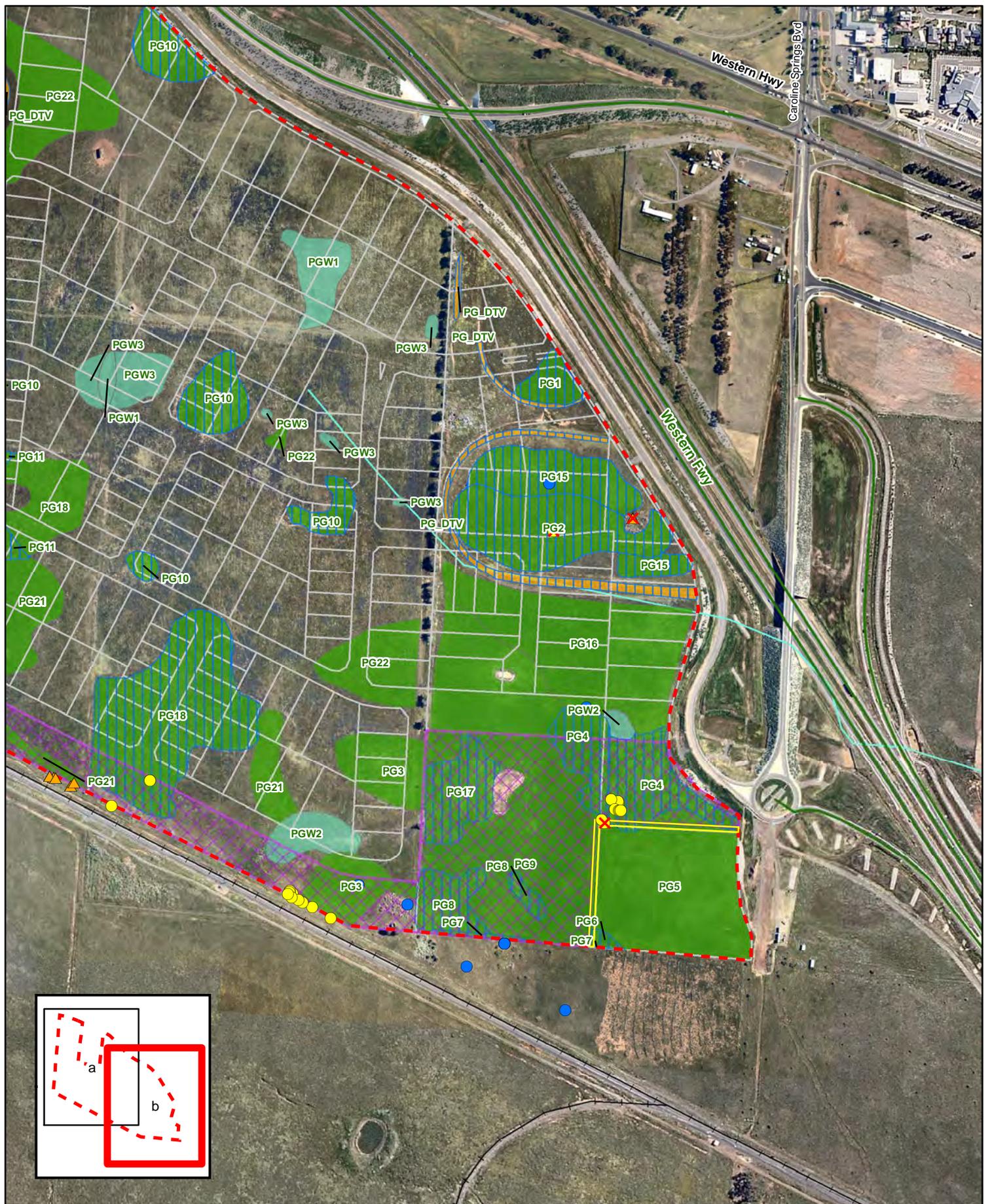
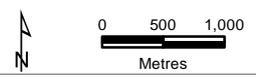


Figure 2b
Proposed development plan and impact on ecological features
Ravenhall

- Study Area
- Proposed reserves (29.72 ha)
- 6m fire buffer
- Vegetation Impacts**
- × Individual plant losses
- Vegetation losses
- Significant fauna**
- Striped Legless Lizard
- Significant flora**
- Spiny Rice-flower
- ▲ Arching Flax-lily
- EPBC Act listed communities**
- Natural Temperate Grassland of the Victorian Volcanic Plain
- Remnant Vegetation**
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5440_Fig05_VegImpact_MB 30/07/2014 melsley