LEVEL CROSSING REMOVAL PROJECT

Cars waiting at the Calder Park Drive level crossing

Calder Park Drive and Holden Road

Publication of Preliminary Documentation under the Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act)

June 2024

VICTORIA'S BIG BUILD

AECOM GHD JOINT VENTURE

LEVEL CROSSING REMOVAL PROJECT

10 ADDITIONAL LEVEL CROSSING REMOVALS AND 4 ROAD CLOSURES

080 - Calder Park Drive, Calder Park
Flora and Fauna Report

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LEVEL CROSSING REMOVAL PROJECT

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1. Introduction

1.1 Overview

The AECOM-GHD Joint Venture (JV) was engaged by the Level Crossing Removal Project (LXRP) to undertake planning and environment assessments for the combined Calder Park Drive and Holden Road Level Crossing Removal Project (the project). This technical report presents findings of the Flora and Fauna Assessments and will inform LXRP of potential design constraints and legislative implications.

1.2 Scope

The objective of this existing conditions assessment was to undertake a study of ecological features of the Investigation Area (IA) to inform the design and development of the project. The assessment included a desktop assessment of government databases, review of existing flora and fauna assessment reports previously completed within the IA, and field assessments to document existing conditions.

The scope of the existing conditions assessment included the following:

- Undertake a desktop assessment and literature review to provide information relating to the potential presence of ecological values protected under State and Commonwealth legislation (Section 1.3)
- Undertake a site assessment of the IA to:
    - Map the extent and assess the quality of remnant native vegetation as defined in the *Guidelines for the removal, destruction or lopping of native vegetation* (DELWP 2017)
    - Identify potential habitat for threatened flora and fauna
    - Confirm the presence of Department of Energy, Environment and Climate Action (DEECA) mapped wetlands
    - Identify vegetation protected under local government planning overlays
- Conduct targeted surveys in line with relevant government guidelines for threatened communities, flora and fauna listed under State and Commonwealth legislation

These existing conditions assessment is supported by a number of appendices including:

- Appendix A – Figures
- Appendix B – Plates
- Appendix C – Protected Matters Search Tool (PMST)
- Appendix D – Past *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) Referrals within the IA
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- Appendix N – Golden Sun Moth *Synemon plana* Report
- Appendix O – Growling Grass Frog *Litoria raniformis* Report

The findings of the existing conditions assessments were used to inform detailed design of the proposed level crossing removals.

1.3 Relevant State and National Policy and Legislation

Throughout the assessment process consideration has been given to the following biodiversity legislation and policies:

Commonwealth

- *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)

State

- *Flora and Fauna Guarantee Act 1988* (FFG Act)
- *Planning and Environment Act 1987* (P&E Act)
- *Environment Effects Act 1978* (EE Act)
- *Catchment and Land Protection Act 1994* (CaLP Act)
- *Wildlife Act 1975*
- *Guidelines for the removal, destruction and lopping of native vegetation* (DEWLP 2017) (the Guidelines)

1.4 Investigation Area

The Calder Park Drive and Holden Road level crossings are located on the Sunbury, Bendigo, and Swan Hill railway line, approximately 25 km north-west of the Melbourne CBD. These level crossings are being removed as one project with the removal of the level crossing at Holden Road to be achieved by road closure, and the removal of the level crossing at Calder Park Drive by an elevated road bridge.

The IA covers an area of approximately 136 hectares (ha). Field surveys focused on the following areas of suitable habitat in the IA and, where applicable, areas immediately adjacent to the IA (presented in Figure 1):

- Rail corridor
- Roadsides of Calder Park Drive and Holden Road
- Small section of Banchory Grove Grassland Nature Conservation Reserve
- Undeveloped land within the Calder Park Stabling Yard
- Private land

The IA is situated within the:

- Victorian Volcanic Plain (VVP) bioregion
- Brimbank and Melton City Council areas
- Port Phillip and Westernport Catchment Management Authority area (CMA)

2. Methods

2.1 Desktop Assessment

2.1.1 Database Searches

The following State and Commonwealth-curated databases were accessed:

- NatureKit by DEECA for Ecological Vegetation Classes (EVC) and DEECA Mapshare for mapped wetlands (refer to Figure 2)
- Victorian Biodiversity Atlas (VBA) administered by DELWP for records of species listed under the EPBC Act and/or FFG Act within 5 km of the IA (refer to Figure 3 and Figure 4)
- EPBC Act Protected Matters Search Tool (PMST) administered by Department of Climate Change, Energy, the Environment and Water (DCCEEW) to identify Matters of National Environmental Significance (MNES) predicted, or with habitat predicted, to occur within 5 km of the IA and past referrals that overlap with the IA
- Aerial imagery of the IA (Google Earth, NearMaps) from 2011 to 2022
- VicPlan online administered by the Department of Transport and Planning (DTP) for planning information on zones and environmental overlays (refer to Figure 5)
- MSA Mapshare Tool published by DEECA in 2022 to identify whether the IA was covered by a Melbourne Strategic Assessment (MSA) levy area

The review of the VBA and PMST databases incorporated a 5 km buffer to capture records of highly mobile fauna species, and to account for the possible lack of historic survey effort for threatened species in the IA.

2.1.2 Literature Review

The following reports and referrals relevant to the IA were reviewed:

- Calder Park Stabling Yards – Ecological Impact Assessment (AECOM 2012)
- Calder Park Stabling Yards EPBC referral No. 2012/6439
- Other past referrals identified by the PMST search tool with areas that overlap the IA

2.2 Site Assessment

A number of general site assessments were conducted within the IA and surrounds between 2020 and early 2023 to collect data on ecological values. The first site assessment was undertaken across two days in September and October 2020 as part of a Rapid Field Assessment, to gain a high-level understanding of the potential ecological constraints of the project (AECOM-GHD JV 2021). Due to changes in the IA over time, several additional site assessments were undertaken across six days in November and December 2021 (05/11/21, 17/11/21, 25/11/21, 07/12/21, 21/12/2021 and 23/12/2021) on 29 July 2022 and 5 April 2023.

Site assessments involved:

- A site walkover (including taking photographs)
- Mapping the extent and quality of remnant native vegetation in accordance with the Guidelines
- Identifying threatened flora and fauna species/communities and potential habitat
- Identifying vegetation protected under local government planning overlays
- Identifying the presence of significant weed species including those declared under the CaLP Act and Weeds of National Significance (WoNS) identified under the National Weeds Strategy

2.3 Likelihood Assessment

An assessment was undertaken of the likelihood of threatened and/or migratory species occurring within the IA. This included species that are:

- Listed as threatened under the EPBC Act
- Listed as migratory and marine under the EPBC Act
- Listed as threatened in Victoria under the FFG Act

This assessment was completed for species recorded on the VBA and/or predicted to occur by the PMST within 5 km of the IA.

A number of species were eliminated from the VBA list and are not considered further in this report:

- Threatened flora species that are outside their natural range but are commonly used for landscaping and amenity, including Rough-barked Apple *Angophora floribunda*, Spotted Gum *Corymbia maculata*, Buxton Gum *Eucalyptus crenulata*, Southern Blue-gum *Eucalyptus globulus* subsp*. globulus*, Giant Honey-myrtle *Melaleuca armillaris* subsp. *armillaris* and Magenta Cherry *Syzygium paniculatum*
- Species considered reliant on marine environments, as no suitable habitat for these species is present in the IA. This includes albatross, petrel, marine turtles, seals, dolphins, sharks, and whale species.

The likelihood of occurrence assessment was undertaken based on the number of available VBA records, year of the most recent VBA record, species ecology and the habitat values observed during the field assessment. The likelihood assessment is presented in Appendix E.

Categories used to rate the likelihood of each species occurring in the IA are outlined in Table 1.

Table 1 Likelihood of Occurrence Categories

Category	Definition
Unlikely	No preferred habitat in the IA. No recent records of the species within the IA. Species unlikely to be present on the site at any time or during any season.
Possible	Habitat is available in the IA which partially meets the requirements of the species. A recent record/s of the species within proximity to the IA. In the case of fauna, the species may infrequently visit for foraging but would not reside, roost, or otherwise depend on habitats in the IA for their survival. Migratory and aerial foraging birds may overfly the site.
Likely	Species has historically been recorded in the IA (or within very close proximity). The IA contains habitat that meets their habitat requirements and is likely to support a population of the species.
Present	Species confirmed to be present within the IA during site assessment or has regularly been observed in recent times.

This process was used to short-list species that have the potential to be impacted by the proposed works and therefore to prioritise field survey effort.

2.4 Targeted Surveys

Field programs conducted for the project between 2021 and 2023 included targeted surveys for:

- Threatened Ecological Communities:
    - Natural Temperate Grasslands of the Victorian Volcanic Plain (NTGVVP) (Appendix H)
- Threatened Flora:
    - Spiny Rice-flower (SRF) *Pimelea spinescens* subsp. *spinescens*. A separate assessment was conducted, and a targeted survey report was issued for SRF given the early flowering period of this species, the high number of individuals within the IA and to gain an early understanding of potential design constraints surrounding SRF (Appendix I).
    - Matted Flax-lily (MFL) *Dianella amoena* (Appendix J)
    - Clover Glycine (CG) *Glycine latrobeana* (Appendix K)
    - Large-headed Fireweed (LHFW) *Senecio macrocarpus* (Appendix L)
- Threatened Fauna
    - Striped Legless Lizard (SLL) *Delma impar* (Appendix M)
    - Golden Sun Moth (GSM) *Synemon plana* (Appendix N)
    - Growling Grass Frog (GGF) *Litoria raniformis* (Appendix O)

All surveys were conducted in line with relevant government guidelines. For detailed methods including survey dates refer to Appendix H to Appendix O.

2.5 Assumptions and Limitations

The assessments were undertaken to provide a broad overview of known and potential biodiversity assets within the IA. The survey effort, combined with information available from other sources, is considered suitable to assess the overall ecological values of the IA. However, the following limitations apply to the assessments:

- Terrestrial vascular plant species (ferns, conifers, and flowering plants) and terrestrial vertebrate fauna (mammals, birds, reptiles, and frogs) are included in this assessment. Non-vascular flora (e.g., mosses, liverworts, lichens), fungi and terrestrial invertebrates have not been considered as part of this assessment, except where listed threatened species are known or suspected to occur, or where bryophytes comprise part of an EVC benchmark. Threatened fish were not surveyed for during the field investigation but are considered as part of this assessment.
- Maps presented in this assessment displaying site information should not be relied on for detailed design during the construction process. A Collector for ArcGIS mapping application was used in the field to record site information. This mapping tool was accurate to +/- five metres (m).
- The VBA can be used to search a defined geographical area to produce species lists of flora and fauna that have been recorded previously within the area of interest. The databases are only as accurate as the quality and quantity of data that have been recorded and documented from the area of interest. The use of the database in a desktop assessment has the following limitations:
    - Location details for many records (typically older records) have a relatively low degree of accuracy (e.g. within one kilometre). Thus, the database search may not pick up some records of species that were made within the site historically.

- These datasets are not exhaustive. Many locations locally and across Victoria have a low level of documented survey effort for one or more groups of flora and fauna. It does not necessarily provide a definitive list for an area under data interrogation. During field surveys, it is not uncommon to find species at locations for which there are few or no previous nearby database records.

- Threatened species can be difficult to detect and their presence dependent on seasonal influences. Targeted flora and fauna surveys were conducted at optimal times during recognised survey windows and were considered to entail sufficient survey effort to detect each species.
- Threatened ecological communities can be difficult to detect and dependent on seasonal influences. Species composition and the appearance of the ecological community can vary seasonally as native wildflowers and floristic material are more visible when flowering during spring. Targeted surveys were conducted at optimal times of their survey periods and were considered sufficient survey effort to detect each species.
- Land management practices such as mowing of grass may limit identification of grass and thus identification of NTGVVP. This was particularly relevant along the Calder Park Drive road easements. Assumptions for these areas have been based off third party data that AECOM-GHD JV have not been able to validate.
- Other sources of information concerning ecological and biodiversity values in the IA may exist (e.g. unpublished reports by private consultancies not available to AECOM-GHD JV at the time of preparing this report)
- Targeted surveys are have been recently undertaken by Biosis Pty Ltd for Major Road Projects Victoria (MRPV) in areas of the Calder Freeway interchange upgrade project study area that overlap with the project IA. The findings of those surveys have been shared with LXRP and have been incorporated into this document.
- The assessment does not include:
    - Assessment of potential impacts of the project. An ecological impact assessment has been completed separately.
    - Development of detailed mitigation measures that may be required for the project. Mitigation measures will be outlined in a separate ecological impact assessment.
    - Preparation of permits and/or referrals that may be required under any relevant legislation (e.g., a permit to remove protected flora under the FFG Act, or referral of the project to DCCEEW under the EPBC Act)

3. Desktop Results

3.1 Database Searches

3.1.1 Protected Matters Search Tool

The PMST identified a number of MNES that may occur, or for which suitable habitat may occur within 5 km of the IA. Results of the PMST search conducted on the 21 December 2021 are summarised in Table 2. A copy of the PMST is presented in Appendix C.

Table 2 Summary of PMST Results

MNES	Number of Occurrences
World Heritage Properties	None
National Heritage Places	None
Wetlands of International Significance (Ramsar Sites)	None
Great Barrier Reef Marine Park	None
Commonwealth Marine Areas	None
Listed Threatened Ecological Communities	Five listed ecological communities including: • Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia • Grassy Eucalypt Woodland of the Victorian Volcanic Plain • Natural Temperate Grassland of the Victorian Volcanic Plain • Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains • White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland
Listed Threatened Species	Thirty-four listed threatened species including: • Eleven birds • Three fish • One frog • One invertebrate • Two mammals • Fourteen plants • Two reptiles
Listed Migratory Species	Fifteen migratory species
Past referrals	Nine past referrals within the IA relating to ecological matters. A summary of the past referrals can be found in Appendix D.

3.1.2 Victorian Biodiversity Atlas

The VBA dataset (published on 1 September 2021) was accessed on 7 January 2022 for records of threatened species recorded within 5 km of the IA within the last 30 years. The following section provides the results of the VBA extract. Locations of threatened species records can be found in Figure 3 and Figure 4. Appendix E contains an assessment on the likelihood of occurrence of these species within the IA.

Fauna

Seventeen (17) fauna species were identified in the VBA search that were either listed as threatened under the FFG Act, listed as threatened under the EPBC Act, listed under the EBPC Act as a migratory or marine species, or listed under a combination of these listings. A summary of these species is presented below:

- Five (5) species listed under the EPBC Act as either Vulnerable, Endangered or Critically Endangered (one bird, one amphibian, two reptiles, and one fish)
- Four (4) species were listed under the EPBC Act as a marine or migratory species (or both)
- Fourteen (14) species were listed under the FFG act as Vulnerable, Endangered, Critically Endangered or Extinct (two reptile, one mammal, two amphibians, one fish, and eight birds)

Flora

There were nineteen (19) threatened species identified in the VBA search. A summary of these species can be found below:

- Four (4) species listed under the EPBC Act as either Vulnerable, Endangered or Critically Endangered
- Nineteen (19) species were listed under the FFG act as Vulnerable, Endangered or Critically Endangered

3.1.3 Ecological Vegetation Classes (EVC)

Based on DEECA EVC modelling, there is potential for four EVCs to occur within the IA. These EVCs and their Bioregional Conservation Status in the Victorian Volcanic Plain bioregion (VVP) are listed in Table 3 and are mapped in Figure 2.

Table 3 EVC Mapping within 5km of the IA derived from NatureKit

EVC number	EVC name	Bioregional Conservation Status
55	Plains Grassy Woodland	Endangered
132	Plains Grassland	Endangered
851	Stream Bank Shrubland	Endangered
895	Escarpment Shrubland	Endangered

3.1.4 Named Waterways and Wetlands

The IA contains a section of Taylors Creek that intersects Calder Park Drive and then intersects the rail line. Victoria Road Drain also occurs within the IA and crosses the rail line before joining Taylors Creek. Unnamed drainage lines occur within the Stabling Yard paddock, these drainage lines form tributaries of Taylors Creek or Jacksons Creek (Figure 2).

No DEECA mapped wetlands are located within the IA.

3.1.5 Environmental Overlays

The IA occurs within the Melton City Council, Hume City Council and Brimbank City Council municipalities. Two environmental significance overlays apply to the IA (Figure 5):

- ESO1 (Melton Planning Scheme) covers a significant section of the rail corridor within the IA. The objective of ESO1 is to protect and conserve remnant native woodlands, open forests, grasslands.
- ESO6 (Brimbank Planning Scheme) applies to the rail corridor in sections of the IA south of Holden Road and Calder Park Drive. The objective of ESO6 is to protect and enhance the viability and connectivity in areas of identified biological significance.

3.1.6 MSA MapShare

Based on the MSA MapShare tool, a small section of the IA along Holden Rd and a section south of the Plumpton Road intersection falls within the MSA area.

3.2 Literature Review

The IA overlaps significantly with the study area for the Calder Park Stabling Yard, particularly within the Stabling Yard paddocks and some parts of the rail corridor. As such, a review of the ecological impact assessment (AECOM 2012) and associated EPBC referral (EPBC 2012/6439) has been provided below.

The review of additional past EPBC referrals with areas that overlap the IA is provided in Appendix D.

3.2.1 Calder Park Stabling Yards – Ecological Impact Assessment (AECOM 2012)

This report investigated land for the development of the Stabling Yard area (77 Holden Road, Diggers Rest) which included private land and a section of the Sunbury Line rail corridor (this area currently comprises some of the current IA). The key findings of this assessment were:

- The Calder Park Stabling Yard area did not contain native vegetation but did contain some small areas of Degraded Treeless Vegetation, which were further categorised as Modified Treeless Vegetation.
- Within the rail reserve, seven patches of EVC 132 Plains Grassland were recorded including four patches of 'Very High' conservation significance vegetation and three patches of 'High' conservation significance vegetation. The four patches of 'Very High' conservation significance vegetation also meet the criteria for the EPBC Act-listed ecological community NTGVVP. All seven patches are protected under FFG Act as the listed community Western (Basalt) Plains Grassland Community.
- Targeted flora surveys were conducted for LHFW, CG, MFL, SRF and Arching Flax-lily *Dianella longifolia var grandis*. No threatened flora was observed in the study area (and therefore the IA). However, Ecology Partners Pty Ltd recorded two SRF individuals in a previous ecology assessment in the rail corridor.
- GGF were recorded within two dams in the study area (and therefore the IA) during targeted surveys.
- Targeted surveys were conducted in the Stabling Yard area for the SLL and Fat-tailed Dunnart *Sminthopsis crassicaudata* concurrently using the tile grid method. Neither species were found. However, given the cryptic nature of the SLL, it was concluded that the species may occur within suitable habitat in the west of the study area (and therefore the IA) in degraded treeless vegetation patches, and the rail reserve.

- Targeted surveys were also conducted for the Golden Sun Moth which was not observed. This species was not considered further.
- Planted, mature hollo- bearing trees were identified as potential habitat for arboreal mammals and birds including the nationally Vulnerable Grey-headed Flying Fox *Pteropus poliocephalus*.

3.2.2 EPBC Approval of Action (EPBC 2012/6439)

Approval under the EPBC Act for construction and operation of the passenger train stabling and maintenance yard facility at Calder Park was granted on the 27 September 2013, with GGF protection conditions. This approval is in effect until 31 December 2025. Relevant conditions of approval include the preparation and implementation of Growling Grass Frog Conservation Management Plan with commitments of implementing sedimentation and erosion control measures, decommissioning of dams outside of the breeding season, prevention of Chytrid fungus spread, installation of Growling Grass Frog fencing to prevent entry into site, and creation of habitat in the result of unavoidable habitat loss.

4. Flora and Vegetation Assessment Results

4.1 Overview

The IA is a highly modified landscape dominated by exotic vegetation. Native vegetation has largely been cleared and degraded by a long history of agriculture, particularly in the Calder Park Stabling Yard area and private paddocks. Parts of the IA have also been degraded by earth works and general construction associated with the development of rail, road, and transmission line infrastructure (Plate 1). Additionally, the Calder Park Motorsport Complex was constructed in the 1960s directly east of the IA. This facility has resulted in degradation of adjacent private property and the rail corridor largely due to extensive earthworks, including but not limited to, the construction of large earth bunds that have likely altered the hydrology and catchment of Taylors Creek, and the soil composition and structure of the surrounding land (Plate 2). Material stockpiling and illegal dumping in the rail corridor and roadsides have also resulted in degradation of native vegetation and fauna habitat (Plate 3).

Vegetation was mostly dominated by exotic species including Common Wild Oat *Avena fatua*, Paspalum *Paspalum* sp., Ribwort Plantain *Plantago lanceolata*, Panic Grass *Panicum* sp., Brown-top Bent *Agrostis capillaris*, Phalaris *Phalaris aquatica* and CaLP Act listed weed species including Serrated Tussock Nassella trichotoma, Chilean Needle Grass *Nassella neesiana*, African Boxthorn *Lycium ferocissimum*, and Artichoke Thistle *Cynara cardunculus* subsp. *flavescens* (Plate 4). Planted rows of non-indigenous Sugar Gums *Eucalyptus cladocalyx* are also present within the Calder Park Stabling Yard area, Holden Road, and the rail corridor. The IA also contained an area of revegetation north of Holden Road adjacent to the Calder Freeway that consisted of River Red Gum *Eucalyptus camaldulensis* and Yellow Box *Eucalyptus melliodora*. The IA encompasses some residential streets off Calder Park Drive that supported planted non-indigenous native trees and one planted River Red Gum *Eucalyptus camaldulensis.*

Despite the highly modified and degraded nature of the IA, some areas of remnant native grassland vegetation do persist, particularly within Banchory Grove Grassland Nature Conservation Reserve and discrete MTM biosites within the rail corridor. These areas represent the native landscape of the area and are characterised by treeless areas of perennial native grasses such as Kangaroo Grass *Themeda triandra*, Wallaby Grass *Rytidosperma* spp. and native herbs and small shrubs. These areas provide some of the last remaining habitat for some threatened fauna and flora species, which are discussed in the below sections. Some small patches of low-quality native grassland are also present along the Holden Road roadside. These areas are mostly re-colonised areas of Wallaby Grass and Spear Grass *Austrostipa* spp. The following sections summarise the results of the targeted surveys conducted for threatened flora and fauna species for the project.

4.2 Native Vegetation Extent and Condition

During field surveys undertaken by the AECOM-GHD JV, 12 patches of EVC 132 Plains Grassland were mapped with a total area of 1.51 ha. These include:

- Eight medium to high quality patches. Seven of these patches were mapped within existing MTM managed biosites in the rail corridor and one large patch was mapped within Banchory Grove Grassland Nature Conservation Reserve (Plate 5). These patches were mostly dominated by Kangaroo Grass and Wallaby Grass and contained a number of threatened and protected species such as SRF, MFL, Common Everlasting *Chrysocephalum apiculatum* and Lemon Beauty Heads *Calocephalus citreus*. These species are discussed further in the following sections. Parts of these patches of native vegetation also qualified as threatened ecological communities protected under State and Commonwealth legislation (discussed in Section 4.3).

- Four low quality patches of EVC 132 Plains Grassland were mapped along Holden Road roadsides. These patches were small, isolated areas of recolonising Wallaby Grass and did not contain other native herbs or shrubs (Plate 6). Habitat Zone 12 falls within the MSA area based on MSA MapShare.

The Calder Park Drive roadside was slashed at the time of assessment and there was insufficient floristic material at the time AECOM-GHD JV assessment to accurately map vegetation quality and extent.

However, the Calder Park Drive roadside within with the IA was subject of a separate assessment completed by Biosis Pty Ltd for a MRPV project. These surveys occurred after those completed by the AECOM-GHD JV were able to determine vegetation quality and extent in the subject area. The findings of Biosis (2022) have therefore been adopted by this report. Biosis (2022) identified five low quality patches of EVC 132 Plains Grassland on the roadside of Calder Park Drive, south of Glenbruar Drive (0.18 ha), and one low quality patch of EVC 821 Tall Marsh along Taylors Creek (0.05 ha) within, or partially within, the project IA. It is noted that Biosis (2022) presents one habitat hectare score per each EVC identified by their assessment. The total extent of native vegetation in the IA is therefore:

- EVC 132 Plains Grassland: 1.69 ha
- EVC 821 Tall Marsh: 0.05 ha

The location of all native vegetation is shown in Figure 6. Habitat hectare scores are provided in Appendix F.

4.3 Threatened Vegetation Communities

4.3.1 EPBC Act Listed Communities

NTGVVP is currently listed as critically endangered under the EPBC Act. NTGVVP is dominated by a ground layer of native tussock-forming perennial grasses interspersed with a variety of herbs. Native tussock-forming grasses include Kangaroo Grass *Themeda triandra*, Wallaby Grasses *Austrodanthonia* spp., Spear Grasses *Austrostipa* spp., and Tussock Grasses *Poa* spp. Native herbs include daisies (from the Asteraceae family), lilies (from the families Anthericaceae, Asphodelaceae, and Phormiaceae), peas (from the Fabaceae family), and orchids (from the Orchidaceae family). In some circumstances, the native herbs are dominant whilst the native tussock-forming grasses are sparse. Large shrubs and trees are absent to sparse.

NTGVVP is synonymous with EVC 132_61 Plains Grassland (recorded in the IA) where it meets certain condition thresholds:

- Patch must occur within or near the Victorian Volcanic Plain bioregion
- Trees and shrubs should be absent or sparse such that the foliage cover of native tree is less than or equal to 5%
- The patch must be larger or equal to 0.05 ha
- The dominant native species represent at least 50% of the native species and the perennial tussock cover; or non-grass weeds comprise less than 30% of ground cover; or native forbs (wildflowers) comprise at least 50% of total vegetation cover during spring and summer

Results

Three patches of NTGVVP totalling an area of 0.68 ha were mapped within the IA. Two were small, isolated linear patches in Metro Trains Melbourne (MTM) managed biosites, within the rail corridor, and one patch was mapped within Banchory Grove Conservation Reserve. The sizes and locations of the patches are listed below:

- 0.08 ha (rail corridor)
- 0.11 ha (rail corridor)
- 0.49 ha (Banchory Grove Grassland Nature Conservation Reserve)

The patch mapped in Banchory Grove Grassland Nature Conservation Reserve is likely a part of a larger patch that extends further in Banchory Grove Grassland Nature Conservation Reserve, which has a total area of approximately 21 ha. Patches within MTM biosites were small, isolated patches.

Other patches of EVC 132_61 Plains Grassland within the IA did not meet the condition thresholds to qualify as NTGVVP, including patches mapped within the rail corridor, south of Calder Park Drive, and along the roadsides of Holden Road and Calder Park Drive. No vegetation as identified by Biosis (2022) is considered to meet the condition thresholds to constitute the community.

For full details and mapping of NTGVVP patches see Appendix H.

4.3.2 FFG Act Listed Communities

EVC 132 Plains Grassland is synonymous with Western (Basalt) Plains Grasslands, which is a threatened ecological community listed under the FFG Act (DELWP n.d.). Therefore, patches of Plains Grassland (EVC 132) were also considered to qualify as Western (Basalt) Plains Grassland. Twelve patches of Western (Basalt) Plains Grassland, totalling an area of 1.69 ha, were identified within the IA.

4.4 Threatened Flora

4.4.1 Spiny Rice-flower

SRF is listed as Critically Endangered under the EPBC Act and critically endangered under the FFG Act. The species is a sub-shrub which grows between 5-30 cm in height (DEWHA 2009). Flowering typically occurs between April and August, producing small white, cream, or yellow flowers (Flora of Victoria 2017). Spiny Rice-flower is most commonly found in grasslands and occasionally in grassy woodlands and open shrublands (DEWHA 2009).

Results

A total of seventy three (73) SRF were found within the IA consisting of 55 individuals with MTM biosites, 11 in the rail corridor outside the MTM biosites (four (4) of which are in a fenced no-go-zone), six individuals along Calder Park Drive road easement and one individual in Banchory Grove Grassland Nature Conservation Reserve. Full details of SRF targeted survey, legislative implications and mapping can be found in Appendix I.

4.4.2 Matted Flax-lily

MFL is currently listed as Endangered under the EPBC Act and critically endangered under the FFG Act. The MFL is a tufted, mat–forming perennial lily. Leaves are grey-green, dull crimson at the base. The inflorescence is erect, 20 – 90 cm long, with sweetly fragrant flowers with six yellow to green anthers. Fruits are ovoid purple berries to 7 mm long. Flowering occurs from October to April. The MFL generally occurs in grassland and grassy woodland habitats.

Results

Four MFL mats were identified during targeted surveys within the rail corridor:

- Mat 1: 0.5 m by 0.5 m
- Mat 2: 1.0 m by 0.5 m
- Mat 3: 1.0 m by 1.0 m
- Mat 4: 0.5 m by 0.5 m

Full details of MFL targeted survey, legislative implications and mapping can be found in Appendix J.

4.4.3 Clover Glycine

CG is currently listed as Vulnerable under the EPBC Act and vulnerable under the FFG Act. The species is a small perennial herb endemic to south-eastern Australia, occurring in Tasmania, Victoria, and South Australia, mostly in grasslands and grassy woodlands. This species generally grows to only a few cm in height and has trifoliate leaves with sessile to subsessile leaflets (5 – 20 mm long and 4 – 12 mm wide) on petioles 5 – 50 mm long. The species generally flowers in spring in the lower elevation and in summer in higher elevation areas.

Results

No CG plants were found during targeted surveys and this species is not considered further in this assessment.

Further details can be found in Appendix K**.**

4.4.4 Large-headed Fireweed

LHFW is currently listed as Vulnerable under the EPBC Act and critically endangered under the FFG Act. LHFW is a small (<70 cm high) perennial daisy endemic to south eastern Australia (South Australia and Victoria, formerly Tasmania). Characteristics of LHFW include its relatively squat form, coarse foliage and large, rigid bracts that are obvious even when the plant is not in full flower. The inflorescence bears 2 – 10 relatively large heads (18 mm long, 20 mm wide), each supporting up to 150 yellowish florets surrounded by linear, pointed bracts. The LHFW occurs in a variety of habitats including grasslands, sedgelands, shrublands and woodlands, generally on sparsely vegetated sites on sandy loam to heavy clay soils, often in depressions that are waterlogged in winter.

Results

No LHFW plants were found during targeted surveys and this species is not considered further in this assessment.

Further details can be found in Appendix L**.**

4.4.5 FFG Act Protected Flora

In addition to threatened flora listed under the EPBC Act which are also listed as threatened under the FFG Act (SRF and MFL), four flora species were recorded within the IA that are listed as ‘protected flora’ under the FFG Act:

- Common Everlasting *Chrysocephalum apiculatum*
- Lemon Beauty Heads *Calocephalus citreus*
- Jersey Cudweed *Helichrysum luteoalbum*
- Tufted Burr Daisy *Calocephalus scapigera*

These species were recorded in MTM biosites and Banchory Grove Grassland Nature Conservation Reserve during flora surveys.

4.5 Noxious Weeds

A number of CaLP listed weeds and WoNS were found throughout the IA. All weeds were found throughout the IA and not restricted to specific locations. Table 4 outlines weeds identified and their status.

Table 4 Noxious Weeds within the IA

Scientific Name	Common Name	CaLP or WoNS
Cynara cardunculus	Artichoke thistle	CaLP listed
Echium plantagineum	Paterson's curse	CaLP listed
Foeniculum vulgare	Fennel	CaLP listed
Juncus acutus	Spiny Rush	CaLP listed
Lycium ferocissimum	African Boxthorn	CaLP listed, WoNS
Nassella neesiana	Chilean Needle Grass	CaLP listed, WoNS
Nassella trichotoma	Serrated Tussock	CaLP listed, WoNS
Physalis hederifolia	Ivyleaf groundcherry	CaLP listed

5. Fauna Assessment Results

5.1 Overview

Despite the highly modified nature of the IA, there are several habitat types that support native fauna including native grasslands, modified grasslands, large hollow bearing planted Sugar Gums, artificial dams and aquatic habitat present in minor tributaries of Taylors Creek and Jackson's Creek (Plate 7).

Several native non-threatened fauna species were observed utilising habitat with the IA including:

- Birds (20 native bird species were observed utilising the IA including parrots, birds of prey and passerine birds). Refer to Appendix G for a full list of observed birds.
- Mammals (Eastern Grey Kangaroo *Macropus giganteus*)
- Reptiles (Tiger Snake *Notehis scutatus*, Tussock Skink *Pseudemoia pagaenstecheri* and Eastern Blue Tongue *Tiliqua scincoides scincoides*)
- Amphibians within aquatic habitat (Eastern Froglet *Crinia signifera*, Banjo Frog *Limnodynastes dumerilii*, Spotted Marsh Frogs *Limnodynastes tasmaniensis* and Striped Marsh Frogs *Limnodynastes peronii*)

Introduced species were also observed utilising the IA including:

- Birds (Spotted Dove *Spilopelia chinensis*, Indian Myna *Acridotheres tristis*, European Starling *Sturnus vulgaris* and House Sparrow *Passer domesticus*)
- Mammals (European Rabbit *Oryctolagus cuniculus*, European Hare *Lepus europaeus* and Red Fox *Vulpes vulpes*)
- Fish (Japanese Weather Loach *Misgurnus anguillicaudatus* and Mosquito Fish *Gambusia affinis*)

A full species list of observed fauna can be found in Appendix G**.**

A number of threatened fauna species were identified as potentially occurring within the IA. Targeted surveys were conducted for these species and the results have been summarised in the following sections.

5.2 EPBC Act Listed Fauna Species

5.2.1 Striped Legless Lizard

SLL is currently listed as vulnerable under the EPBC Act and endangered under the FFG Act. The SLL superficially resembles a small snake but is a member of the *Pygopodidae* family. Typical appearance is pale grey-brown above and cream below, with the head darker than the body and a series of stripes along the sides of the body which become diagonal bands on the tail and can reach up to a total length of 300 mm.

Results

A total of seven patches of SLL habitat was mapped within the IA (Appendix M). The size, location and quality of habitat is detailed below:

- Patch 1 – 0.748 ha of high-quality habitat in Banchory Grove Grassland Nature Conservation Reserve, adjacent and north of Calder Park Drive, directly west of the Calder Park Drive level crossing
- Patch 2 – 0.267 ha of medium to high quality habitat in the rail corridor south of Calder Park Drive

- Patch 3 – 0.157 ha of medium to high quality habitat in the rail corridor south of Holden Road
- Patch 4 – 0.482 ha of medium to high quality habitat in the rail corridor south of Holden Road
- Patch 5 – 0.099 ha of medium quality habitat in the rail corridor north of Holden Road
- Patch 6 – 2.190 ha of low to medium quality habitat within the Calder Park Stabling Yard area
- Patch 7 – 0.226 ha of low-quality habitat in the Calder Park Stabling Yard adjacent to Holden Road

Patch 1 represents 0.748 ha of high-quality habitat within Banchory Grove Grassland Nature Conservation Reserve. This patch is likely to be a part of a larger habitat area that extends further into Banchory Grove Grassland Nature Conservation Reserve which has a total area of approximately 21 ha and falls largely outside of the IA. A large part of the mapped patch within the IA was also mapped as NTGVVP and was dominated by native grasses, such as Kangaroo Grass and Wallaby Grass, with a diversity of native herbs and forbs. Furthermore, SLL sheltering habitat such as loose and embedded rock, grass tussocks and cracking soil were present. One record from the VBA of an SLL from 2012 is present in the northern section of Banchory Grove Grassland Nature Conservation Reserve. Given this patch consists of high-quality habitat and is larger than 0.5 ha, it is considered an important population as defined by the national SLL referral guidelines (DSEWPaC 2011).

All other identified patches were not considered important populations. Medium to high quality patches within the rail corridor did not meet the minimum size threshold of 0.5 ha to be considered an important population (DSEWPaC 2011). Furthermore, these patches are isolated and under pressure from adjacent rail and road infrastructure. Habitat within the Calder Park Stabling Yards was also not considered to support important populations as these areas were dominated by CaLP listed weeds such as Serrated Tussock, Phalaris, and Chilean Needle-grass. Furthermore, targeted surveys were conducted in Patch 3 and did not identify any individuals. As such, habitat in the Calder Park Stabling Yard is considered unsuitable to low quality.

Full details of SLL targeted survey and mapping can be found in Appendix M.

Targeted surveys have been undertaken by Biosis Pty Ltd for MRPV in areas of the Calder Freeway interchange upgrade project study area that overlap with the project IA. The findings of those surveys have been shared with LXRP and are incorporated into this document.

5.2.2 Golden Sun Moth

GSM is currently listed as vulnerable under the EPBC Act and vulnerable under the FFG Act. The GSM is a medium sized day-flying moth with a wingspan of 3.1 - 3.4 cm. Female moths have dark grey upper wings and bright orange hindwings. The males have dark brown upper wings and bronze/brown hindwings (DEWHA 2009).

Results

Targeted surveys for GSM were conducted in potentially suitable habitat such as native and modified grasslands. No GSM were found during targeted surveys and this species is not considered further in this assessment. These findings are consistent with previous ecological surveys conducted in the area (AECOM 2012).

Full details of GSM targeted survey and mapping can be found in Appendix N.

5.2.3 Growling Grass Frog

GGF is a member of the 'Bell Frog' species complex, which includes generally large and very colourful specimens (Barker, Grigg and Tyler 1995). The GGF is one of the largest species of this complex with females growing to approximately 100 mm long (DEWHA 2008; Barker et al. 1995). Colouration in adults varies but consistently includes a pale green mid-dorsal stripe often with large black spots in a roughly linear series on the back. Dark brown warty protuberances occur on the dorsum and upper surface of the legs and the groin and posterior of the thighs are turquoise (Barker et al. 1995).

Results

Targeted surveys were conducted at 12 sites across the IA for GGF. Sites included artificial dams and sections of Taylors Creek and Victoria Road Drain. Habitat in the IA is highly degraded and is of low to marginal habitat value for GGF. Targeted surveys did not detect the species. Feral predators including cats, foxes, and noxious fish were observed in the IA. Terrestrial habitat is heavily disturbed and does not support overwintering habitat features such as rocks and logs or other aquatic habitats.

As documented in Appendix O, targeted surveys for GGF were undertaken in accordance with national survey guidelines. These survey guidelines stipulate a 90% detection probability and thus the results of targeted surveys would usually be considered to provide evidence of species absence within the IA. However, past records included detection of the species in 2010 and in early 2020. Based on the sum of these results, undertaken over multiple calling periods, it is concluded that GGF occur in the IA on an opportunistic and intermittent basis. The intermittent occurrence of the species combined with the degraded nature of the habitat indicates that the IA is unlikely to support an important population. It should be noted that an existing EPBC referral approval for the Stabling Yard with conditions is in place for the protection of GGFs. Context for this existing approval is provided in section 3.2.2 and further details of the targeted survey and mapping is detailed in Appendix O.

5.3 FFG Act Listed Fauna Species

In addition to threatened fauna listed under the FFG Act (SLL, GGF and GSM), Tussock Skink *Pseudemoia pagenstecheri* (Volcanic Plains) was detected during tile gird surveys for SLL (Appendix M). The species was found in an area adjacent to Banchory Grove Grassland Nature Conservation Reserve that forms part of a larger habitat area that extends further into the reserve. The habitat was dominated by native grasses such as Kangaroo Grass and Wallaby Grass and included sheltering habitat such as loose and embedded rock and cracking soil.

Tussock Skink occurs in grassland and grassy woodland habitats, and in Victoria can be found from the Grampians, through the basalt plains west of the Grampians to north-east Victoria. Tussock Skinks which occur on the Volcanic Plains and in the High Country of Victoria are listed as endangered under the FFG Act.

6. Conclusion

The AECOM-GHD JV was engaged by the LXRP to undertake flora and fauna assessments for the Calder Park Drive and Holden Road Level Crossing Removal Project. This assessment identified the following ecological features within the IA:

- Seventeen (17) patches of EVC 132 Plains Grassland were mapped totalling an area of 1.69 ha. Medium to high quality patches were mapped within Banchory Grove Grassland Nature Conservation Reserve and MTM biosites within the rail corridor.
- One (1) patch of EVC 821 Tall Marsh on Taylors Creek totalling an area of 0.05 ha.
- All patches of EVC 132 Plains Grassland are synonymous with the Western (Basalt) Plains Grasslands.
- Three (3) patches of NTGVVP with a total area of 0.68 ha were identified within the IA, two of these patches were mapped in the rail corridor and the other within Banchory Grove Grassland Nature Conservation Reserve.
- ESO1 covers the IA within the rail corridor in the Melton Planning Scheme and ESO6 applies to the rail corridor in sections of the IA south of Holden Road and Calder Park Drive in the Brimbank Planning Scheme.
- Seventy-three (73) critically endangered SRF were identified with the IA. Most individuals were found within the MTM biosites and/or in the rail corridor, six (6) were found in Calder Park Drive roadside and one (1) plant was found in Banchory Grove Grassland Nature Conservation Reserve.
- Four (4) endangered MFL mats were found within the IA. All individuals were found in the rail corridor north and sound of the Calder Park Drive level crossing.
- One patch of SLL habitat was identified as likely to support an important population as defined by the national SLL referral guidelines (DSEWPaC 2011). This patch comprised of 0.748 ha of high-quality habitat and was mapped within Banchory Grove Grassland Nature Conservation Reserve.
- No GSM were found during targeted surveys, these results are consistent with previous assessment conducted by AECOM (2012). The IA is unlikely to support an important population of the species.
- No GGF were found during targeted survey across the 12 sites. However, their presence cannot be ruled out as they are known to occur within degraded habitats. Additionally, previous ecological surveys have detected GGFs within two dams in the Calder Park Stabling Yard area (AECOM 2012). An existing EPBC referral approval for the Stabling Yard set in place conditions for the protection of GGFs in that area.
- Tussock Skink (FFG Act listed) was recorded during SLL surveys and is likely to occur in other patches of grassland habitat within the IA.

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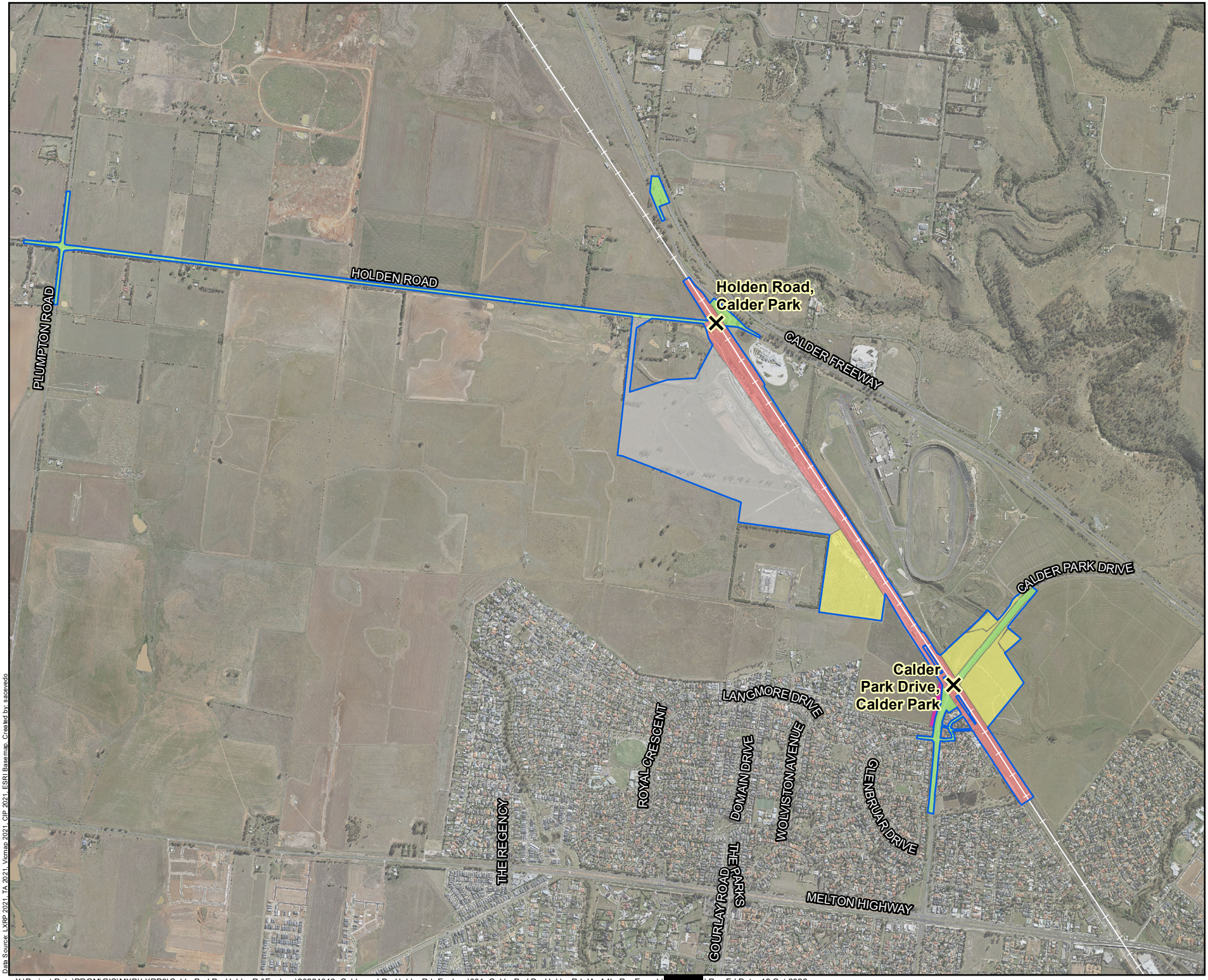
Appendices

Appendix A – Figures



LEGEND

- Level crossing site
- Railway
- Investigation area
- Roads and road sides
- Rail and Rail corridor
- Stabling yard paddocks
- Private land
- Banchory Reserve

Calder Park Drive and Holden Road Investigation Area

Figure 1

LEVEL CROSSING REMOVAL PROJECT

AECOM GHD JOINT VENTURE

0 125 250 500

Metres

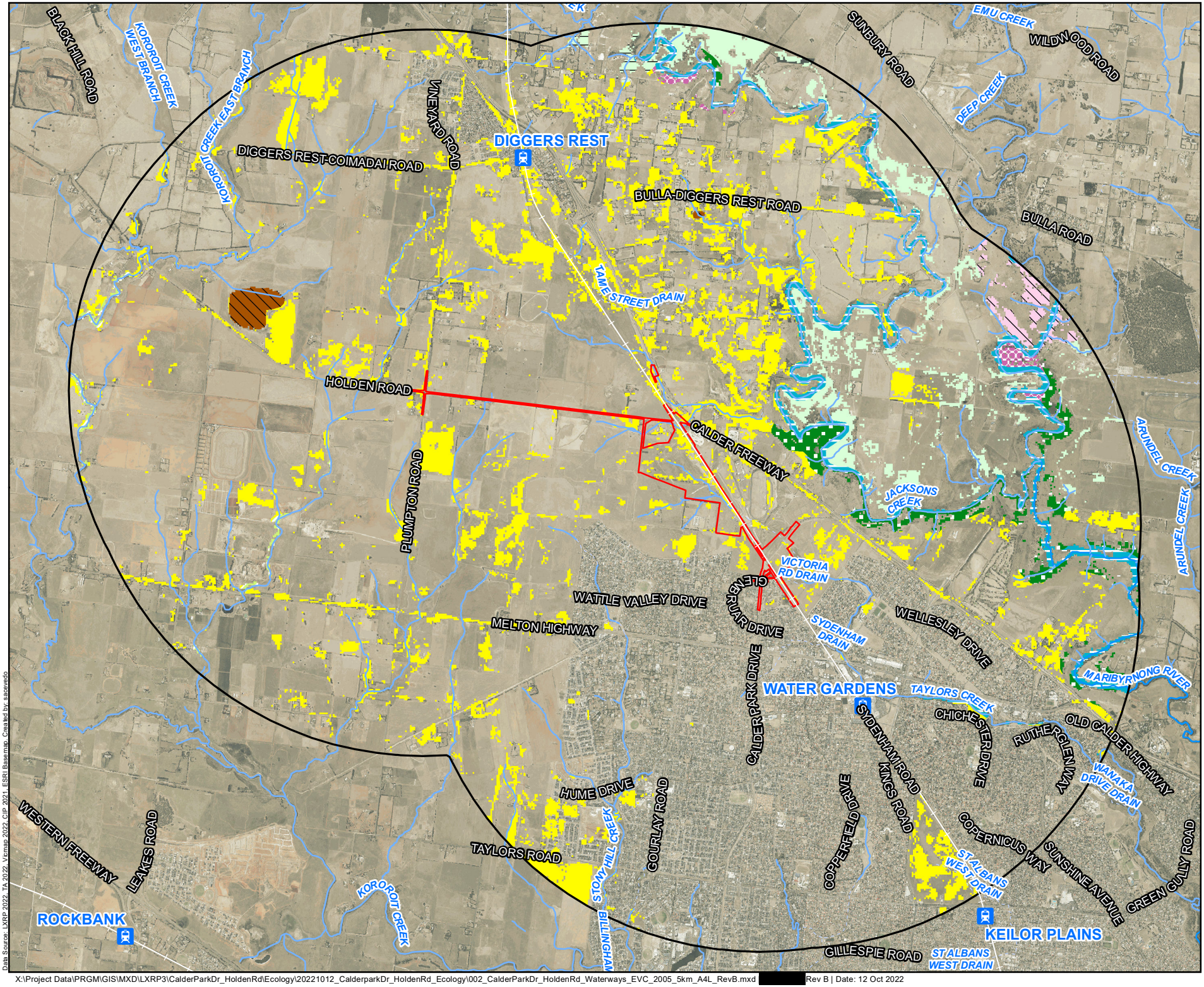
N

Paper Size A4

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

Data Source: LXRP 2021, TA 2021, Vicmap 2021, CIP 2021, ESRI Basemap, Created by: sacevedo

Figure 2 Waterways and 2005 EVC Modelling



LEGEND

- Train Station
- Investigation area
- Railway
- 5km buffer

Watercourse

- River
- Stream
- Drain/Channel/Other

EVC 2005

- 132 Plains Grassland
- 175 Grassy Woodland
- 55 Plains Grassy Woodland
- 641 Riparian Woodland
- 647 Plains Sedgy Wetland
- 68 Creekline Grassy Woodland
- 71 Hills Herb-rich Woodland
- 851 Stream Bank Shrubland
- 895 Escarpment Shrubland

Water ways and 2005 EVC modelling 5km buffer

Figure 2

LEVEL CROSSING REMOVAL PROJECT

AECOM GHD JOINT VENTURE

0 250 500 1,000

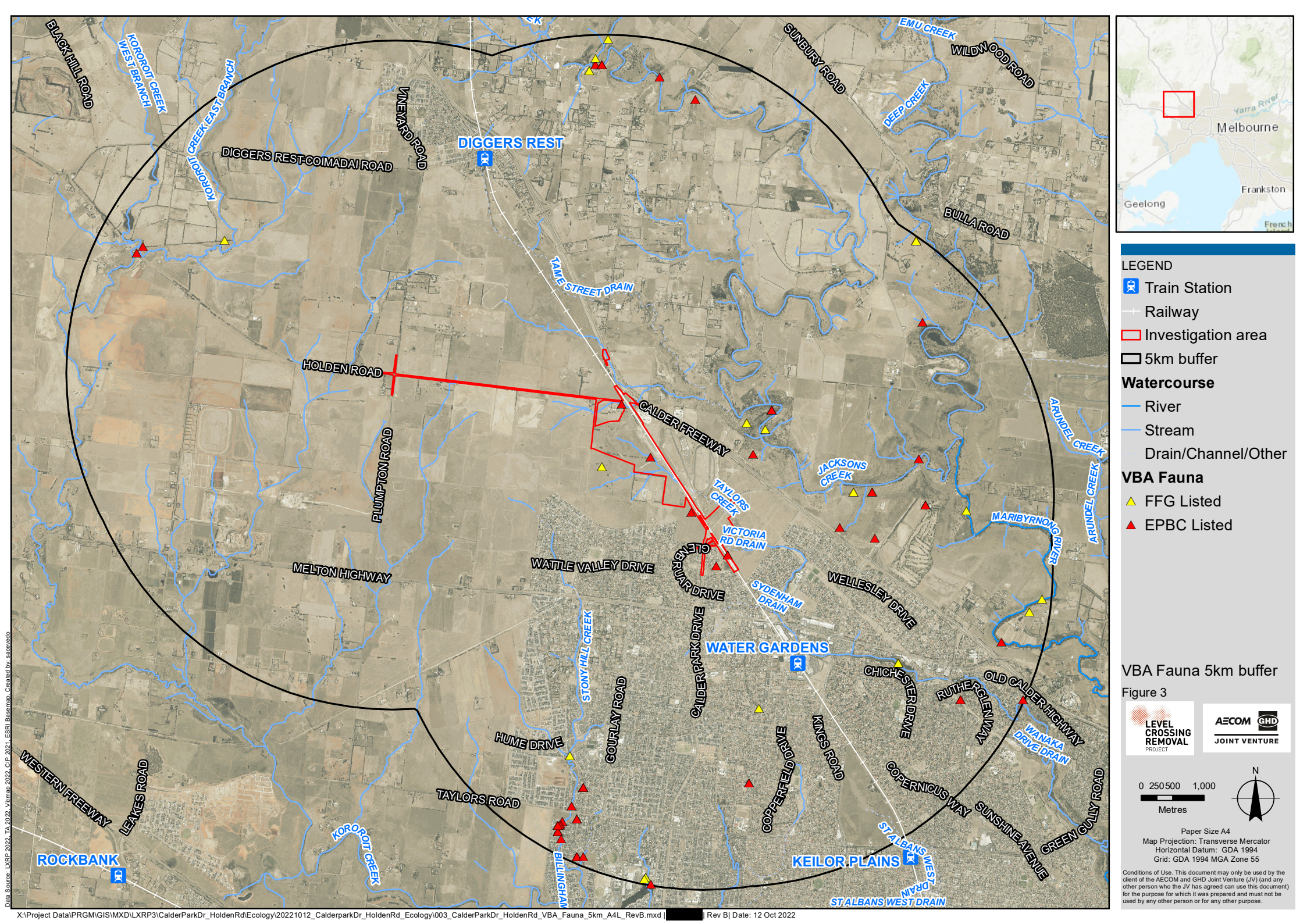
Metres

N

Paper Size A4
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

Data Source: LXRP 2022, TA 2022, Vicmap 2022, CIP 2021, ESRI Basemap. Created by: sacevedo

Figure 3 VBA Fauna Records



LEGEND

- Train Station
- Railway
- Investigation area
- 5km buffer

Watercourse

- River
- Stream
- Drain/Channel/Other

VBA Fauna

- FFG Listed
- EPBC Listed

VBA Fauna 5km buffer

Figure 3

LEVEL CROSSING REMOVAL PROJECT

AECOM GHD JOINT VENTURE

0 250 500 1,000

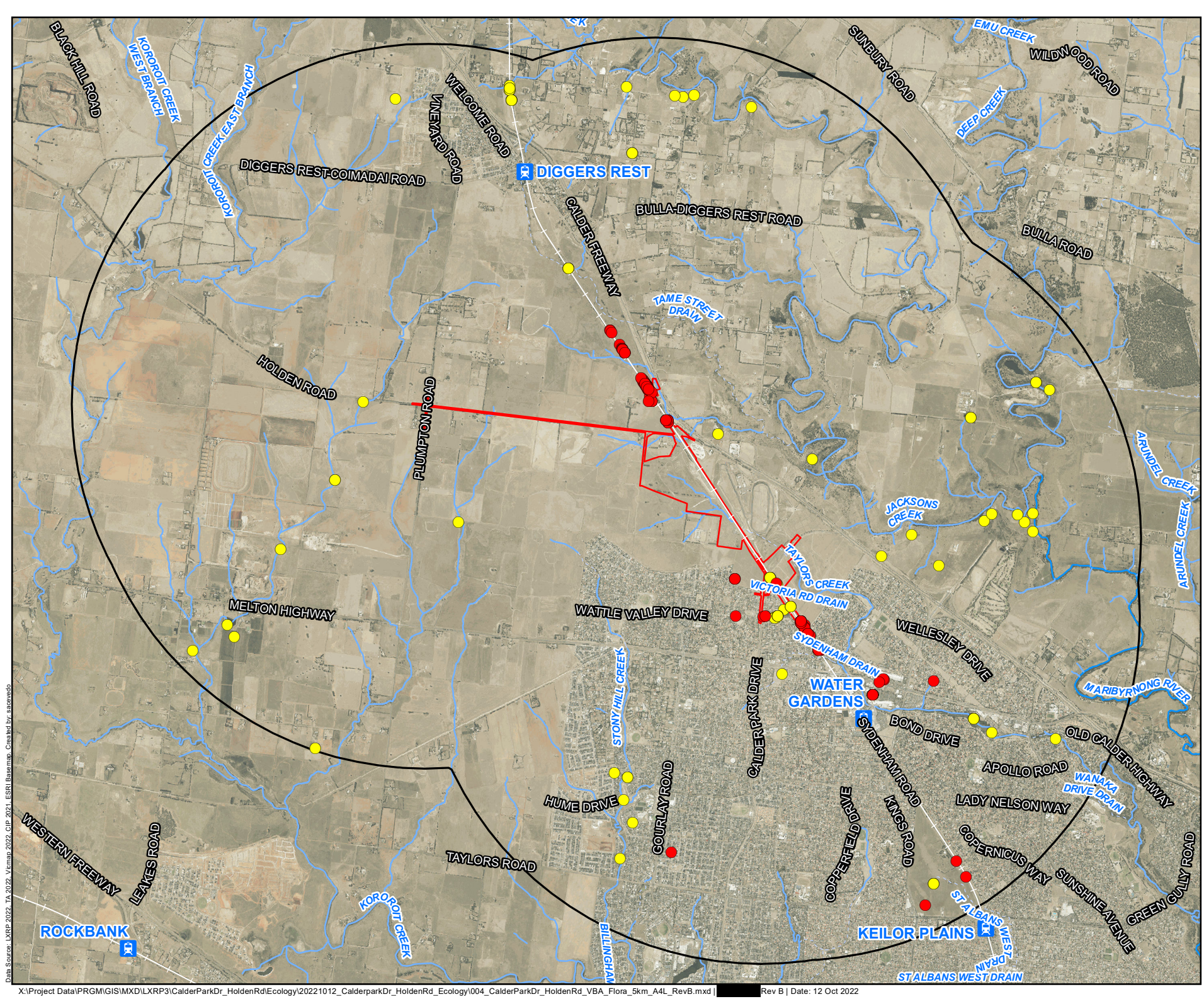
Metres

N

Paper Size A4
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

Data Source: LXRP 2022, TA 2022, Vicmap 2022, CIP 2021, ESRI Basemap. Created by: sacevedo

Figure 4 VBA Flora Records



LEGEND

- Train Station
- Railway
- Investigation area
- 5km buffer

Watercourse

- River
- Stream
- Drain/Channel/Other

VBA Flora

- FFG Listed
- EPBC Listed

VBA Flora 5km buffer

Figure 4

LEVEL CROSSING REMOVAL PROJECT

AECOM GHD JOINT VENTURE

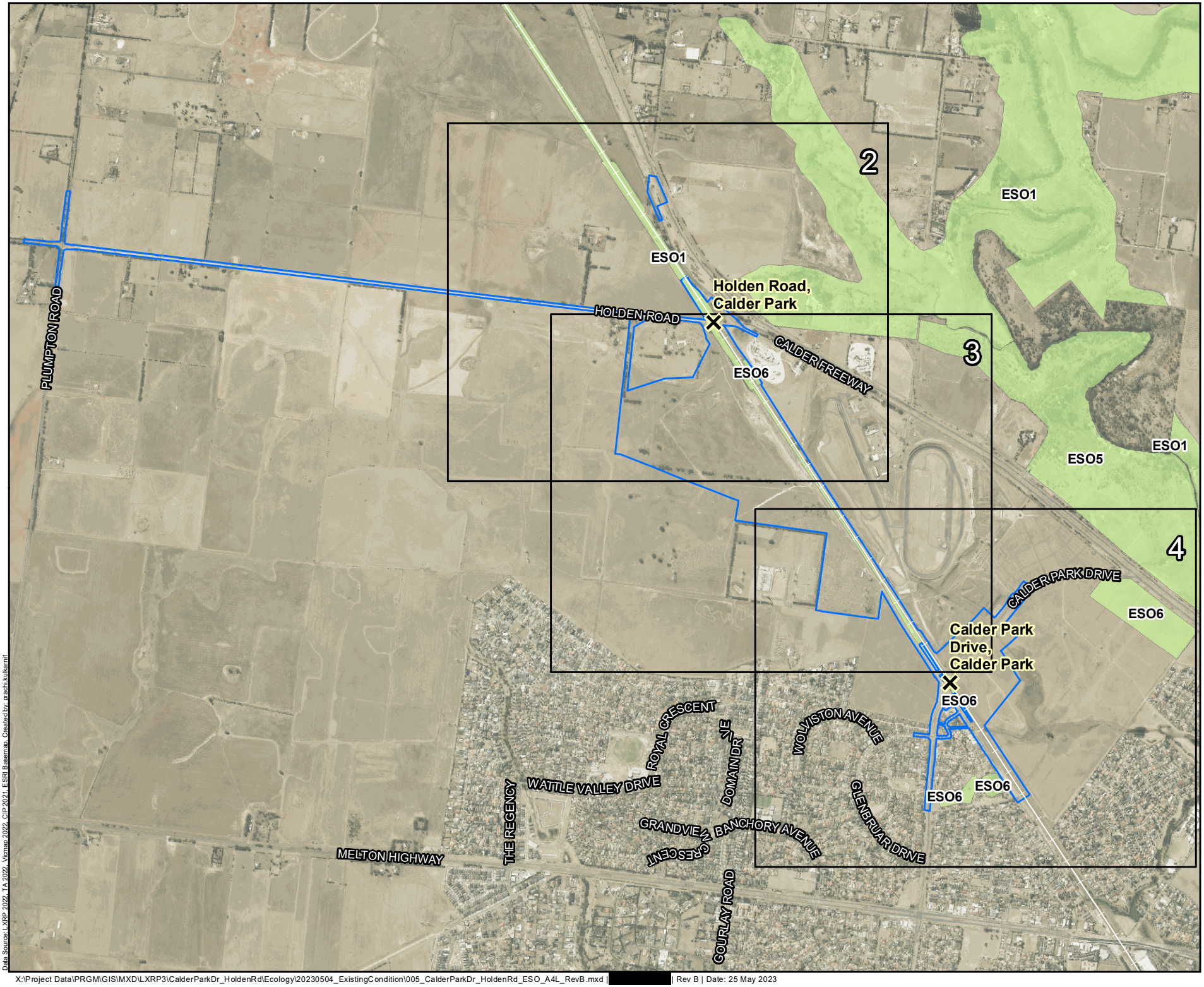
0 250 500 1,000

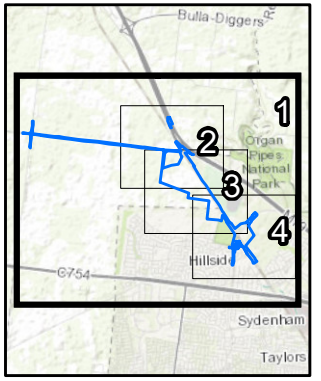
Metres

N

Paper Size A4
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

Figure 5 Environmental Significance Overlay





LEGEND

- Level crossing site
- Investigation area
- Railway

Planning Overlay

- ESO - Environmental Significance Overlay

Calder Park Dr and Holden Rd Environmental Significant Overlays

Figure 5 - 1 of 4
Overview

LEVEL CROSSING REMOVAL PROJECT

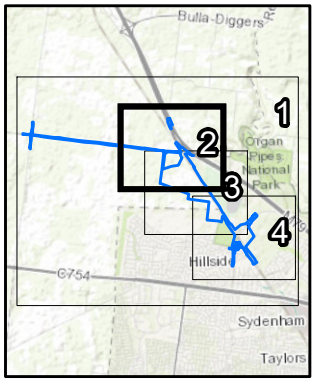
AECOM GHD JOINT VENTURE

0 75150 300
Metres

N

Paper Size A4
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

Data Source: LXRP 2022, TA 2022, Vicmap 2022, CIP 2021, ESRI Basemap. Created by: prachi.kulkarni1



LEGEND

- Level crossing site
- Investigation area
- Railway

Planning Overlay

- ESO - Environmental Significance Overlay

Calder Park Dr and Holden Rd Environmental Significant Overlays

Figure 5 - 2 of 4
Holden Road and Stabling yard

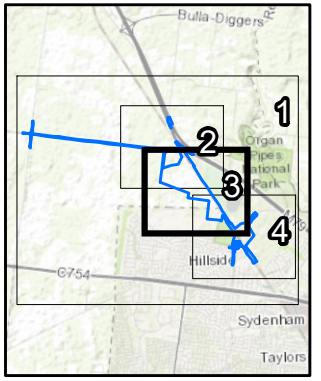
LEVEL CROSSING REMOVAL PROJECT

AECOM GHD JOINT VENTURE

0 25 50 100
Metres

N

Paper Size A4
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55



LEGEND

- Level crossing site
- Investigation area
- Railway

Planning Overlay

- ESO - Environmental Significance Overlay

Calder Park Dr and Holden Rd Environmental Significant Overlays

Figure 5 - 3 of 4
Stabling yard

LEVEL CROSSING REMOVAL PROJECT

AECOM GHD JOINT VENTURE

0 25 50 100
Metres

N

Paper Size A4
Map Projection: Transverse Mercator
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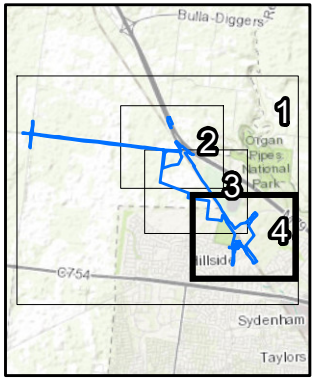


LEGEND

- Level crossing site
- Investigation area
- Railway

Planning Overlay

- ESO - Environmental Significance Overlay

Calder Park Dr and Holden Rd Environmental Significant Overlays

Figure 5 - 4 of 4
Calder Park Drive

LEVEL CROSSING REMOVAL PROJECT

AECOM GHD JOINT VENTURE

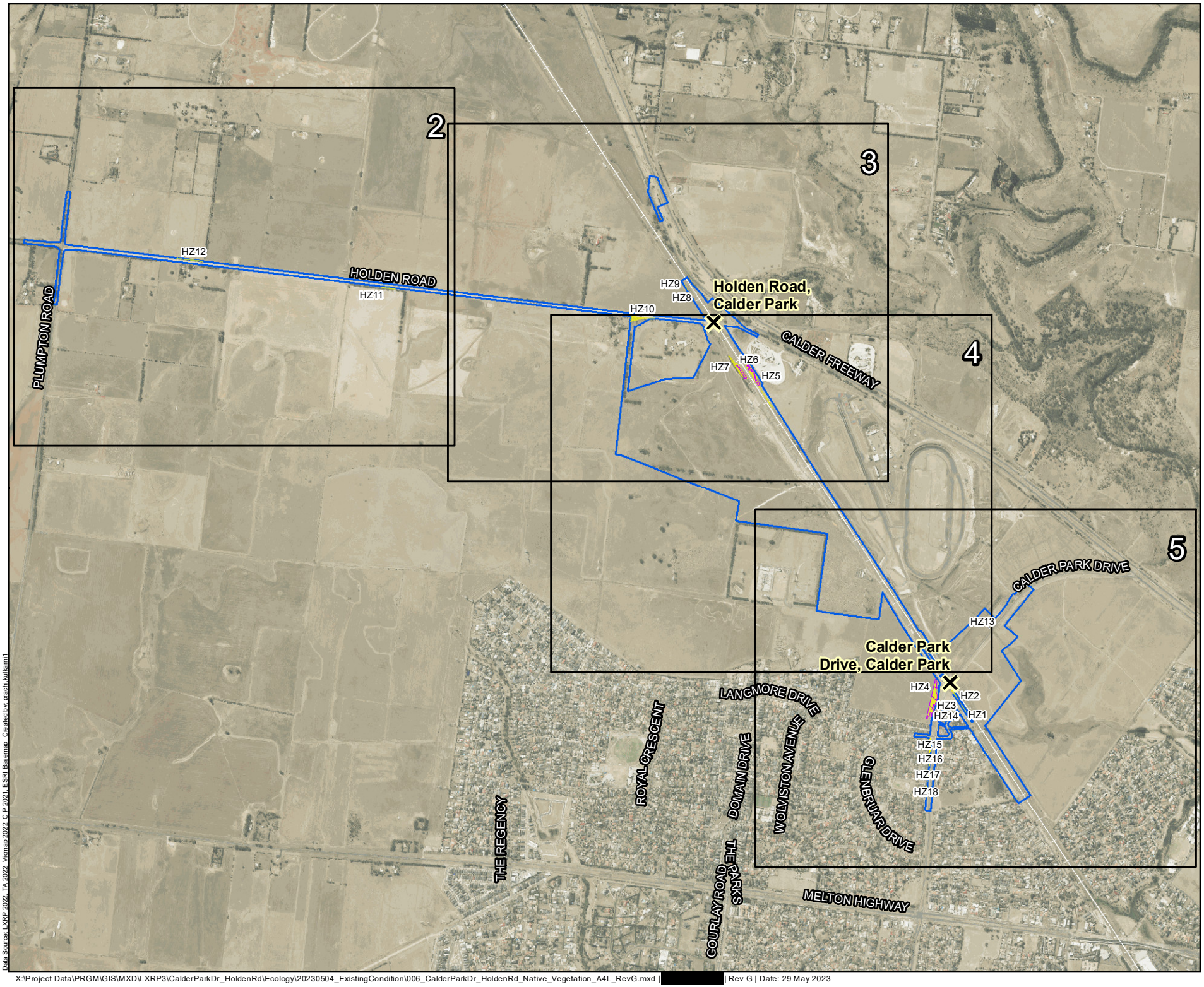
0 25 50 100
Metres

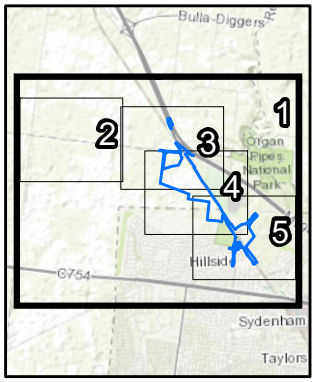
N

Paper Size A4
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

Data Source: LXRP 2022, TA 2022, Vicmap 2022, CIP 2021, ESRI Basemap. Created by: prachi.kulkarni1

Figure 6 Native Vegetation Mapping





LEGEND

- Level crossing site
- Investigation area
- NTGVVP
- Railway

Ecological Vegetation Class

- 132 Plains Grassland/WBPG
- 821 Tall Marsh

Native vegetation mapping

Figure 6 - 1 of 5
Overview

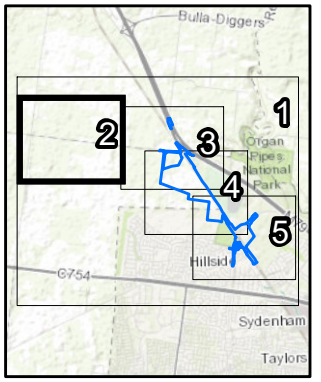
LEVEL CROSSING REMOVAL PROJECT

AECOM GHD JOINT VENTURE

0 135 270 540
Metres

N

Paper Size A4
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55



LEGEND

Investigation area

Ecological Vegetation Class

132 Plains Grassland/WBPG

821 Tall Marsh

Native vegetation mapping

Figure 6 - 2 of 5
Holden Road

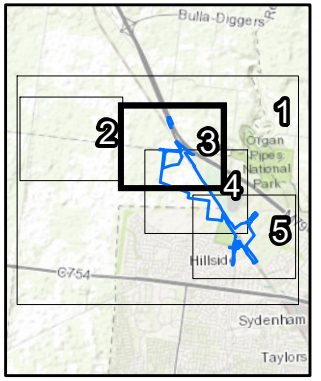
LEVEL CROSSING REMOVAL PROJECT

AECOM GHD JOINT VENTURE

0 50 100 200
Metres

N

Paper Size A4
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55



LEGEND

- Level crossing site
- Investigation area
- NTGVVP
- Railway

Ecological Vegetation Class

- 132 Plains Grassland/WBPG
- 821 Tall Marsh

Native vegetation mapping

Figure 6 - 3 of 5
Holden Road and Stabling yard

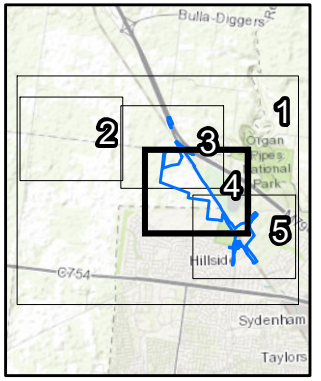
LEVEL CROSSING REMOVAL PROJECT

AECOM GHD JOINT VENTURE

0 50 100 200
Metres

N

Paper Size A4
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55



LEGEND

- Level crossing site
- Investigation area
- NTGVVP
- Railway

Ecological Vegetation Class

- 132 Plains Grassland/WBPG
- 821 Tall Marsh

Native vegetation mapping

Figure 6 - 4 of 5
Stabling yard

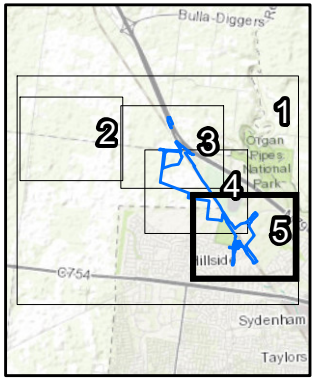
LEVEL CROSSING REMOVAL PROJECT

AECOM GHD JOINT VENTURE

0 50 100 200
Metres

N

Paper Size A4
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55



LEGEND

- Level crossing site
- Investigation area
- Railway

Ecological Vegetation Class

- 132 Plains Grassland/WBPG
- 821 Tall Marsh

Native vegetation mapping

Figure 6-5
Calder Park Drive

LEVEL CROSSING REMOVAL PROJECT

AECOM GHD JOINT VENTURE

0 50 100 200
Metres

N

Paper Size A4
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

Appendix B – Plates

Plate 1 Past earth works within the rail corridor indicated by large rocks and weed infested earth bund

Plate 2 Material stock piling in the rail corridor

Plate 3 Highly degraded land from earth works associated with transmission line infrastructure and the thunder dome

Plate 4 Serrated tussock dominated field in the Calder Park Stabling Yard area

Plate 5 High quality native vegetation within the rail corridor dominated by kangaroo grass

Plate 6 Low quality native vegetation along Holden Road

Plate 7 Planted sugar gums containing habitat for non-threatened native fauna

Plate 8 Low quality aquatic habitat along Taylors Creek

Appendix C – **Protected Matters Search Tool (PMST)**

Australian Government
Department of Agriculture, Water and the Environment

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 02-Mar-2022

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	5
Listed Threatened Species:	35
Listed Migratory Species:	12

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at http://www.environment.gov.au/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	19
Commonwealth Heritage Places:	None
Listed Marine Species:	19
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	6
Regional Forest Agreements:	1
Nationally Important Wetlands:	None
EPBC Act Referrals:	51
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.
Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text	Buffer Status
Grassy Eucalypt Woodland of the Victorian Volcanic Plain	Critically Endangered	Community known to occur within area	In feature area
Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	Endangered	Community may occur within area	In feature area
Natural Temperate Grassland of the Victorian Volcanic Plain	Critically Endangered	Community likely to occur within area	In feature area
Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains	Critically Endangered	Community likely to occur within area	In buffer area only
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community likely to occur within area	In feature area

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Anthochaera phrygia			
Regent Honeyeater [82338]	Critically Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area
Botaurus poiciloptilus			
Australasian Bittern [1001]	Endangered	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Calidris ferruginea](#) Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
[Callocephalon fimbriatum](#) Gang-gang Cockatoo [768]	Endangered	Species or species habitat likely to occur within area	In feature area
[Falco hypoleucos](#) Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Grantiella picta](#) Painted Honeyeater [470]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Hirundapus caudacutus](#) White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Lathamus discolor](#) Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area	In feature area
[Numenius madagascariensis](#) Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
[Pedionomus torquatus](#) Plains-wanderer [906]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
[Rostratula australis](#) Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area	In feature area
FISH			
[Galaxiella pusilla](#) Eastern Dwarf Galaxias, Dwarf Galaxias [56790]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Nannoperca obscura](#) Yarra Pygmy Perch [26177]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Prototroctes maraena](#) Australian Grayling [26179]	Vulnerable	Species or species habitat known to occur within area	In feature area
FROG			
[Litoria raniformis](#) Growling Grass Frog, Southern Bell Frog, Green and Golden Frog, Warty Swamp Frog, Golden Bell Frog [1828]	Vulnerable	Species or species habitat known to occur within area	In feature area
INSECT			
[Synemon plana](#) Golden Sun Moth [25234]	Vulnerable	Species or species habitat likely to occur within area	In feature area
MAMMAL			
[Dasyurus maculatus maculatus (SE mainland population)](#) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat may occur within area	In feature area
[Pteropus poliocephalus](#) Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
PLANT			
[Amphibromus fluitans](#) River Swamp Wallaby-grass, Floating Swamp Wallaby-grass [19215]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Dianella amoena](#) Matted Flax-lily [64886]	Endangered	Species or species habitat known to occur within area	In feature area
[Diuris basaltica](#) Small Golden Moths Orchid, Early Golden Moths [64654]	Endangered	Species or species habitat likely to occur within area	In feature area
[Diuris fragrantissima](#) Sunshine Diuris, Fragrant Doubletail, White Diuris [21243]	Endangered	Species or species habitat may occur within area	In feature area
[Dodonaea procumbens](#) Trailing Hop-bush [12149]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Glycine latrobeana Clover Glycine, Purple Clover [13910]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Lachnagrostis adamsonii Adamson's Blown-grass, Adamson's Blowngrass [76211]	Endangered	Species or species habitat may occur within area	In buffer area only
Lepidium aschersonii Spiny Pepper-cress [10976]	Vulnerable	Species or species habitat may occur within area	In feature area
Lepidium hyssopifolium Basalt Pepper-cress, Peppercress, Rubble Pepper-cress, Pepperweed [16542]	Endangered	Species or species habitat likely to occur within area	In feature area
Leucochrysum albicans subsp. tricolor Hoary Sunray, Grassland Paper-daisy [89104]	Endangered	Species or species habitat likely to occur within area	In feature area
Pimelea spinescens subsp. spinescens Plains Rice-flower, Spiny Rice-flower, Prickly Pimelea [21980]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Pterostylis cucullata Leafy Greenhood [15459]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Rutidosis leptorhynchoides Button Wrinklewort [67251]	Endangered	Species or species habitat known to occur within area	In feature area
Senecio macrocarpus Large-fruit Fireweed, Large-fruit Groundsel [16333]	Vulnerable	Species or species habitat known to occur within area	In feature area
Xerochrysum palustre Swamp Everlasting, Swamp Paper Daisy [76215]	Vulnerable	Species or species habitat may occur within area	In buffer area only
REPTILE			
Delma impar Striped Legless Lizard, Striped Snake-lizard [1649]	Vulnerable	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Tympanocryptis pinguicolla](#) Grassland Earless Dragon [66727]	Endangered	Species or species habitat may occur within area	In feature area

Listed Migratory Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
[Apus pacificus](#) Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Migratory Terrestrial Species			
[Hirundapus caudacutus](#) White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Motacilla flava](#) Yellow Wagtail [644]		Species or species habitat may occur within area	In feature area
[Myiagra cyanoleuca](#) Satin Flycatcher [612]		Species or species habitat known to occur within area	In feature area
[Rhipidura rufifrons](#) Rufous Fantail [592]		Species or species habitat known to occur within area	In feature area
Migratory Wetlands Species			
[Actitis hypoleucos](#) Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
[Calidris acuminata](#) Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area	In feature area
[Calidris ferruginea](#) Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
[Calidris melanotos](#) Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat likely to occur within area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area	In feature area

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State	Buffer Status
Defence		
Defence - RADIO RECEIVING STATION - ROCKBANK [21068]	VIC	In buffer area only
Defence - RADIO RECEIVING STATION - ROCKBANK [21036]	VIC	In buffer area only
Defence - RADIO RECEIVING STATION - ROCKBANK [21064]	VIC	In buffer area only
Defence - RADIO RECEIVING STATION - ROCKBANK [21070]	VIC	In buffer area only
Defence - RADIO RECEIVING STATION - ROCKBANK [21067]	VIC	In buffer area only
Defence - RADIO RECEIVING STATION - ROCKBANK [21069]	VIC	In buffer area only
Defence - RADIO RECEIVING STATION - ROCKBANK [21057]	VIC	In buffer area only
Unknown		
Commonwealth Land - [21521]	VIC	In buffer area only
Commonwealth Land - [21520]	VIC	In buffer area only
Commonwealth Land - [21519]	VIC	In buffer area only
Commonwealth Land - [21545]	VIC	In buffer area only
Commonwealth Land - [21572]	VIC	In buffer area only
Commonwealth Land - [21571]	VIC	In buffer area only
Commonwealth Land - [21522]	VIC	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - [21551]	VIC	In buffer area only
Commonwealth Land - [21553]	VIC	In buffer area only
Commonwealth Land - [22631]	VIC	In buffer area only
Commonwealth Land - [21552]	VIC	In buffer area only
Commonwealth Land - [21592]	VIC	In buffer area only

Listed Marine Species

[Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area overfly marine area	In feature area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat likely to occur within area overfly marine area	In feature area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area	In feature area
Neophema chrysostoma Blue-winged Parrot [726]		Species or species habitat known to occur within area overfly marine area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Rostratula australis as Rostratula benghalensis (sensu lato)			
Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area
Tringa nebularia			
Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area overfly marine area	In feature area

Extra Information

State and Territory Reserves [Resource Information]

Protected Area Name	Reserve Type	State	Buffer Status
Banchory Grove Grassland N.C.R.	Natural Features Reserve	VIC	In feature area
Clarke Road SS.R.	Natural Features Reserve	VIC	In buffer area only
Holden F.R.	Nature Conservation Reserve	VIC	In buffer area only
Jacksons Creek SS.R.	Natural Features Reserve	VIC	In buffer area only
Kororoit Creek K37 SS.R.	Natural Features Reserve	VIC	In buffer area only
Organ Pipes	National Park	VIC	In feature area

Regional Forest Agreements [Resource Information]

Note that all areas with completed RFAs have been included.

RFA Name	State	Buffer Status
West Victoria RFA	Victoria	In feature area

EPBC Act Referrals [Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Controlled action				
Burnside Development	2011/6063	Controlled Action	Post-Approval	In buffer area only
Calder Park Stabling and Maintenance Yard, VIC	2012/6439	Controlled Action	Post-Approval	In feature area
Clearing of Land for Future Urban Development	2008/4453	Controlled Action	Completed	In buffer area only
Diggers Rest Precinct Development, VIC	2012/6556	Controlled Action	Post-Approval	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Controlled action				
Dog Training Facility for Australian Customs Border Protection Service	2010/5552	Controlled Action	Post-Approval	In buffer area only
Gourlay Road Duplication between Becca Way and Hume Drive	2009/5247	Controlled Action	Post-Approval	In buffer area only
Jacksons Hill Estate Stages 50, 42 and 13, Sunbury VIC	2011/5946	Controlled Action	Post-Approval	In buffer area only
Main Road Level Crossing Removal, St Albans, Victoria	2014/7203	Controlled Action	Post-Approval	In buffer area only
Management and control of Serrated Tussock	2007/3320	Controlled Action	Completed	In buffer area only
Melton Renewable Energy Hub, Plumpton, Victoria	2021/8908	Controlled Action	Further Information Request	In feature area
Palmers Road Corridor Duplication	2009/4867	Controlled Action	Completed	In feature area
Residential development, 250 Taylors Road, Sydenham, Vic	2019/8404	Controlled Action	Further Information Request	In buffer area only
Residential Mixed Use Development, 7B Copernicus Way, Keilor Downs, Vic	2016/7734	Controlled Action	Post-Approval	In buffer area only
Residential Subdivision, 803-853 Taylors Road, Caroline Springs, 3023, Victoria	2020/8640	Controlled Action	Post-Approval	In buffer area only
Taxiway Zulu and Northern Compound Project, Melbourne Airport, Vic	2016/7837	Controlled Action	Post-Approval	In buffer area only
Watergarden Town Centre Site at 399 Melton Highway, Taylor Lakes, VIC	2012/6479	Controlled Action	Post-Approval	In buffer area only
Western Outer Ring Main (WORM) ??? High pressure gas transmission pipeline	2019/8569	Controlled Action	Proposed Decision	In feature area
Western Victorian Transmission Network Project	2020/8741	Controlled Action	Assessment Approach	In feature area
Not controlled action				
450mm Water Main Construction to Serve Residential Developments	2008/3999	Not Controlled Action	Completed	In buffer area only
Calder Freeway/Kings Road Interchange & Kings Road Duplication Project	2010/5369	Not Controlled Action	Completed	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Construction of high pressure steel gas main along Caroline Springs Bvd crossing	2005/1968	Not Controlled Action	Completed	In feature area
Development of Watervale Primary School	2005/2023	Not Controlled Action	Completed	In feature area
Electrification of Railway between Watergardens & Sunbury Stations & Associated	2009/5182	Not Controlled Action	Completed	In feature area
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed	In feature area
Modification of an existing artificial farm dam into a constructed wetland and	2010/5626	Not Controlled Action	Completed	In buffer area only
Proposal for construction of Stage 1 residential development, Diggers Rest, Vic	2013/6951	Not Controlled Action	Completed	In buffer area only
Regional Fast Rail Project - Bendigo Country Works Package	2002/675	Not Controlled Action	Completed	In feature area
Residential development - 609 Ballarat Rd, Albion	2006/2575	Not Controlled Action	Completed	In buffer area only
St Andrews Field Residential Development & Infrastructure	2004/1468	Not Controlled Action	Completed	In feature area
subdivision of 195ha into industrial allotments	2005/2048	Not Controlled Action	Completed	In buffer area only
Sunbury Pipeline Looping Project	2011/6159	Not Controlled Action	Completed	In buffer area only
Taylors Hill Estate, corner of Taylors and Gourlay Roads, Taylors Hill	2007/3381	Not Controlled Action	Completed	In buffer area only
Tenterfield Estate residential development	2002/895	Not Controlled Action	Completed	In buffer area only
Upgrade of Taylors Road West	2005/1936	Not Controlled Action	Completed	In feature area
Not controlled action (particular manner)				
Caroline Springs Residential Development (middle sector)	2005/1935	Not Controlled Action (Particular Manner)	Post-Approval	In feature area

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action (particular manner)				
Caroline Springs residential development (northern sector)	2004/1921	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
construction of a gas pipeline	2006/2616	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
drainage, trenching and cable laying works	2003/1132	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
Kororoit Creek Sewer Upgrade Project	2006/2900	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Optus cabling - Melton backbone installation, Sydenham to Melton VIC	2012/6661	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Regional Fibre Optic Project (RFOP)	2003/978	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
Residential Development Stage 1	2003/1185	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
Residential subdivision, Killarney Lakes	2003/1075	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Road extension and bridgeworks at Westwood Drive Burnside VIC	2011/5909	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Windsor Park Residential Development	2001/272	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Referral decision				
Construction of Primary School and Associated Landscaping	2008/4581	Referral Decision	Completed	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Referral decision				
Melbourne Airport runway development program, Melbourne, Vic	2014/7220	Referral Decision	Completed	In buffer area only
Residential development 167-233 Beatty's Road Plumpton VIc	2013/6996	Referral Decision	Completed	In buffer area only
Upgrade of Sydenham Reservoir Holding Tank & Vegetation Clearing for Residential	2009/4941	Referral Decision	Completed	In buffer area only

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

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-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
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-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
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-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact Us page.

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Appendix D – **Past EPBC Referrals within the Investigation Area**

EBPC Act Referrals	Targeted Surveys		Impact and referred matters	Decision on proposed action	Assessment Status	Context in relation to the current Calder Park LX investigation area.
	Species	Results				
Melton Renewable Energy Hub, Plumpton Victoria 2021/8908	Spring Flora	No threatened flora species recorded.	8.401 ha of SLL habitat within the investigation area will be impacted by the proposed development. This loss is unavoidable for the project and will be cleared for the construction of solar panels and a battery area.	• The proposed action was deemed a controlled action due to the presence of the Striped Legless Lizard (listed threatened species and communities sections 18 and 18A) • The project will require assessment and approval under the EPBC Act before it can proceed • Offsets should be provided in an off-site conservation reserve for the loss of SLL habitat	Further information requested.	A small portion of the Melton Renewable Energy Hub, Plumpton Victoria 2021/8908 investigation area overlaps with the current Calder Park LX investigation area. The SLL habitat identified in the 2021/8908 referral does not overlap with the Calder Park LX investigation area.
	Spiny Rice-flower *Pimelea spinescens* subsp. *spinescens*	No Spiny Rice-flower individuals recorded.				
	Golden Sun Moth *Synemon plana*	No GSM individuals recorded.				
	Striped Legless Lizard *Delma impar*	One SLL individual recorded and approximately 26.846 ha of SLL habitat mapped.				
	Growling Grass Frog *Litoria raniformis*	No GGF individuals recorded.				
Palmers Road Corridor Duplication 2009/4867	Golden Sun Moth *Synemon plana*	No GSM individuals were recorded.	• Loss of 2.5 ha of an EPBC listed ecological community (Natural Temperate Grassland of Victorian Volcanic Plain, EVC 132_61) • Loss of Spiny Rice-flower individuals • Loss of two Large Old Trees • Removal or disturbance of suitable habitat for nationally significant flora species • Removal of SLL, GSM and GGF habitat • Disturbance to a translocation site for the SLL • Disturbance to rock escarpments and outcropping • Trapping of fauna in open trenches and subsequent mortality • Decreases in population sizes of local flora and fauna species	The proposed action was deemed a controlled action as it is likely to have a significant impact on listed threatened species and communities (sections 18 and 18A).	Completed	The investigation area for the Palmers Road Corridor Duplication 2009/4867 is extensive and consists of multiple corridors. Corridor 3 and the northernmost portion of Corridor 4 of the Palmers Road Corridor Duplication 2009/4867 overlap with the Calder Park investigation area. The surveys for Corridor 3 undertaken in 2009 identified Plains Grassland and Recolonised Grassland patches to be cleared and retained which may support SLL habitat. The Plains Grassland identified in the referral overlaps with the Calder Park investigation area, noting that more than 12 years has passed since survey was completed.
	Striped Legless Lizard *Delma impar*	No SLL individuals were recorded, but suitable SLL habitat is present.				
	Growling Grass Frog *Litoria raniformis*	No GGF individuals were recorded, however low numbers were recorded in small off-stream water bodies outside of investigation area.				
	Swift Parrot *Lathamus discolor*	No suitable foraging or roosting habitat present in the investigation area.				
	Grey-headed Flying-fox *Pteropus poliocephalus*	No suitable communal roosting habitat present in the investigation area, but small numbers may fly over the area on occasion.				
	Natural Temperate Grassland of the Victorian Volcanic Plain	Investigation area supports patches of the Natural Temperate Grassland of the Victorian Volcanic Plain ecological community.				
	Spiny Rice-flower *Pimelea spinescens* subsp. *spinescens*	Two Spiny Rice-flower individuals were recorded on the western side of Corridor 1 between Riding Boundary and Middle Road in the investigation area.				
	Tough Scurf-pea *Cullen tenax*	The Touch Scurf-pea was recorded in the investigation area.				
	Basalt Podolepis *linearifolia*	The Basalt Podolepis was recorded within the investigation area.				

EBPC Act Referrals	Targeted Surveys		Impact and referred matters	Decision on proposed action	Assessment Status	Context in relation to the current Calder Park LX investigation area.
	Species	Results				
Western Victorian Transmission Network Project 2020/8741	Targeted flora and fauna surveys are yet to be conducted.	Preliminary desktop assessment identified 11 threatened flora species, five threatened ecological communities, seven threatened fauna species and 15 migratory bird species with a moderate to high potential of occurring within or surrounding the investigation area.	The magnitude of the impact on threatened species and ecological communities will be confirmed after field-based assessments. Potential impacts to threatened fauna species may include: • Habitat loss • Habitat fragmentation • Birds and bats colliding with infrastructure • Predation of native wildlife • Introduction and spread of weeds and pathogens	• The proposed action was deemed a controlled action as it is likely to have a significant impact on listed threatened species and communities (sections 18 and 18A) • The impact of the project on flora and fauna species and threatened ecological communities will be reduced through: o Alignment option assessment o Micro-siting o Risk assessment o Environmental management and mitigation measures	Assessment Approach	The area of interest for the Western Victorian Transmission Network Project 2020/8741 is extensive and, whilst some areas overlap with the Calder Park investigation area, there is a lack of information regarding specific threatened species as targeted surveys are yet to be conducted.
Western Outer Ring Main (WORM) High pressure gas transmission pipeline 2019/8569	Targeted flora and fauna surveys are yet to be conducted but a rapid assessment was conducted to map areas of potential native vegetation and/or habitat for significant species. Targeted surveys were conducted in parts of the investigation area previously for Golden Sun Moth *Synemon plana*, Growling Grass Frog *Litoria raniformis*, Spiny Rice-flower *Pimelea spinescens* subsp. *spinescens* and Matted Flax-lily *Dianella amoena* as a part of the Melbourne Strategic Assessment.	The investigation area is likely to contain habitat suitable to threatened flora and fauna species, especially in areas of Plains Grassland, Plains Grassy Woodland, Grassy Woodland, Riparian Woodland, Plains Grassy Wetland, Grey Clay Drainage-line Aggregate, and uncultivated roadsides and paddocks. Targeted surveys as a part of the MSA identified Golden Sun Moth and Matted Flax-lily as present within the investigation area. Clover Glycine, Striped Legless Lizard and Red-chested buttonquail were also identified outside of the investigation area.	• Removal of up to 44.95 ha of Natural Temperate Grassland of the Victorian Volcanic Plain ecological community (EBPC listed) • Removal of up to 4.12 ha of Grassy Eucalypt Woodland and/or White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland • Removal of up to 0.5 ha of Seasonal Herbaceous Wetlands (freshwater) of the Temperate Lowland Plains • Impact to potential Matted Flax-lily, Spiny Rice-flower, Adamson's Blown-grass, Basalt Peppercress, River Swamp Wallaby-grass, Clover Glycine, Large-fruit Fireweed, Golden Sun Moth, Striped Legless Lizard and Growling Grass Frog habitat and populations, if deemed present	• The proposed action was deemed a controlled action as it is likely to have a significant impact on listed threatened species and communities (sections 18 and 18A) • The impact of the project on flora and fauna species and threatened ecological communities will be reduced through: o Re-alignment and micro-siting o Reduction of the disturbance footprint in specific areas o Use of Horizontal Directional Drilling and other trenchless construction methods o Retention and protection of vegetation	Proposed decision	The WORM high pressure gas transmission pipeline 2019/8569 is extensive and covers a vast area. Only one portion of the WORM high pressure gas transmission pipeline crosses the western portion of the Calder Park investigation area that follows Holden Road. Values associated with this area is available on the MSA MapShare tool.
Construction of high-pressure steel gas main along Caroline Springs Bvd crossing 2005/1968	No targeted surveys have been conducted for this specific project.	One previous survey for another project found one adult female GGF 100 m east of the current investigation area in a newly constructed stormwater treatment wetland.	It is not considered likely that this project will have a significant impact on GGF.	The proposed action was not deemed a controlled action and is not likely to have a significant impact on listed threatened species and communities (sections 18 and 18A).	Completed	No project area figure has been provided for the Construction of the high-pressure steel gas main along Caroline Springs Bvd crossing 2005/1968.

EBPC Act Referrals	Targeted Surveys		Impact and referred matters	Decision on proposed action	Assessment Status	Context in relation to the current Calder Park LX investigation area.
	Species	Results				
Electrification of Railway between Watergardens & Sunbury Stations & Associated 2009/5182	Previous assessments within the Project area have been conducted for Spiny Rice-flower, Large-fruit Fireweed, Matted Flax-lily, Basalt Peppercress, Fragrant Leek-orchid, Button Wrinklewort, Clover Glycine, Austral Toad-flax, Small Golden Moths, Swamp Everlasting, Maroon Leek-orchid, Sunshine Diuris, River Swamp Wallaby-grass and Curly Sedge.	Previous surveys identified 708 Spiny Rice-flower individuals, and 337 Large-fruit Fireweed individuals within the Project area. 19 patches (3.02 ha total) of Natural Temperate Grassland of the Victorian Volcanic Plains occurs within the project area.	• Five Spiny Rice-flower individuals are expected to be impacted by the construction of gantries • 0.13 ha is proposed to be removed	• The proposed action was not deemed a controlled action	Completed	The Electrification of Railway between Watergardens & Sunbury Stations & Associated 2009/5182 project area overlaps with the Calder Park investigation area. Patches of Plains Grassland and Plains Woodland habitat identified in the 2009/5182 referral overlaps with the Calder Park LX investigation area.
	Fauna surveys and desktop assessments were undertaken along the Project area.	There is potentially suitable habitat for the SLL and GSM within the Project area. Possible GSM habitat is isolated, small, and surrounded by exotic grassland/pasture.				
Drainage, trenching and cable laying works 2003/1132	Flora assessment	Across various sites, Rice-flower *Pimelea spinescens*, Large-fruit Groundsel *Senecio macrocarpus*, Billy Buttons *Craspedia* sp. 2, and Western (Basalt) Plains Grassland Community have been found.	Across the project area, trenching works may cause minor disturbance to vegetation.	• The proposed action was not deemed a controlled action • Areas identified as threatened fauna habitat should be searched	Post-approval	Due to the large expanse of the project, multiple MNES investigations have been conducted, many of which are not relevant to the LX Calder Park site. Only a small section of the Drainage, trenching and cable laying works project area overlaps with the Calder Park investigation area.
	Fauna assessment	Habitat potentially exists for the Growling Grass Frog, Striped Legless Lizard and Grassland Earless Dragon across the investigation area.				
Regional Fibre Optic Project (RFOP) 2003/978	Flora assessment	Across various sites, Sunshine Diuris *fragrantissima*, Spiny Rice-flower *Pimelea spinescens* subsp. *spinescens*, Large-fruit Fireweed *Senecio macrocarpus*, and Button Wrinklewort *Rutidosis leptorhynchoides* and Western (Basalt) Plains Grassland Community have been found.	Across the project area, flora may be disturbed when digging the trench, but the cable is to be largely ploughed within the existing vehicular track.	• The proposed action was not deemed a controlled action • The boundaries of Biosites of national significance will be fully fenced and signposted before works commence	Post-approval	Due to the large expanse of the project, multiple MNES investigations have been conducted, many of which are not relevant to the Calder Park site. No project area figure has been provided for the Regional Fibre Optic Project (RFOP) 2003/978.
	Striped Legless Lizard *Delma impar* and Growling Grass Frog *Litoria raniformis*.	No SLL or GGF have been seen at or near the site since 1992.				

Appendix E – **Likelihood Assessment**

Legend

EPBC Act
CR – Critically Endangered
EN – Endangered
VU – Vulnerable
Mi – Migratory
Ma – Marine

FFG Act
Extinct
Critically Endangered
Endangered
Vulnerable

Record
VBA results (year of most recent record, number of records)
PMST – Protected Matters Search Tool

Table 5 Fauna Likelihood Assessment Table

Scientific Name	Common Name	Conservation Status		Source, (number of records, year of most recent record)	Habitat Present (Y/N)	Likelihood of Occurrence	Rationale
		EPBC Act	FFG Act				
Amphibians							
Litoria raniformis	Growling Grass Frog	VU	Vulnerable	PMST, VBA (2019, 43)	Y	Present	Some suitable habitat present in the form of artificial dams and along Taylors Creek. Recently recorded.
Pseudophryne bibronii	Brown Toadlet		Endangered	VBA (2010, 2)	N	Unlikely / Possible	Species unlikely to occur within IA. Species has largely declined within Melbourne and surrounds. This species typically occupies woodlands along gullies and small creeks, which do not occur in the IA.
Birds							
Actitis hypoleucos	Common Sandpiper	Mi, Ma	Vulnerable	PMST	N	Unlikely	No suitable habitat within the IA such as lakes, estuaries mudflats. Species may occasionally fly over site on route to adequate habitat. No recent records within or in close proximity to the IA.

Scientific Name	Common Name	Conservation Status		Source, (number of records, year of most recent record)	Habitat Present (Y/N)	Likelihood of Occurrence	Rationale
		EPBC Act	FFG Act				
Anthochaera phrygia	Regent Honeyeater	CR	Critically Endangered	PMST	N	Unlikely	No suitable habitat within the IA such as woodlands. The species is typically recorded in the north east of Victoria. No recent records within or in close proximity to the IA.
Apus pacificus	Fork-tailed Swift	Mi, Ma		PMST	Y	Unlikely	Some suitable habitat present, but no recent records. The species may use the air space above the site, but not reside, roost, or otherwise depend on habitat in the IA for their survival. No recent records.
Ardea alba modesta	Eastern Great Egret		Vulnerable	VBA (2018, 2)	Y	Possible	May occasionally forage in aquatic habitat near or adjacent to IA such as dams and Taylors creek, but is unlikely to depend on habitat within the IA. May also fly above site on route to larger wetlands and watercourses.
Ardea ibis	Cattle Egret	Ma		VBA (1990, 1)	Y	Possible	May occasionally forage in aquatic habitat near or adjacent to IA such as dams and Taylors creek, but is unlikely to depend on habitat within the IA. May also fly above site on route to larger wetlands and watercourses.
Aythya australis	Hardhead		Vulnerable	VBA (2018, 2)	Y	Possible	May occasionally use aquatic habitat near or adjacent to IA such as artificial dams, but is unlikely to depend on habitat within the IA. May also fly above site on route to larger wetlands and watercourses.
Botaurus poiciloptilus	Australasian Bittern	EN	Critically Endangered	PMST	Y	Possible	May use aquatic habitat near or adjacent to IA such as densely vegetated verges of dams and Taylors creek, but is unlikely to rely on habitat within the IA. May fly above site on route to larger wetlands and watercourses.

Scientific Name	Common Name	Conservation Status		Source, (number of records, year of most recent record)	Habitat Present (Y/N)	Likelihood of Occurrence	Rationale
		EPBC Act	FFG Act				
Calidris acuminata	Sharp-tailed Sandpiper	Mi, Ma		PMST	N	Unlikely	No suitable habitat within the IA such as lakes, estuaries and mudflats. Species may occasionally fly over site on route to adequate habitat. No recent records within or in close proximity to the IA.
Calidris ferruginea	Curlew Sandpiper	CR, Mi, Ma	Critically Endangered	PMST	N	Unlikely	No suitable habitat within the IA such as coastal estuaries, bays and shallow wetlands, tidal mudflats, and sandflats. No recent records within or in close proximity to the IA.
Calidris melanotos	Pectoral Sandpiper	Mi, Ma		PMST	N	Unlikely	No suitable habitat within the IA such as lakes, estuaries and mudflats. Species may occasionally fly over site on route to adequate habitat. No recent records within or in close proximity to the IA.
Calidris minuta	Little Stint	Ma		VBA (1996, 1)	N	Unlikely	No suitable habitat within the IA such as fresh to brackish wetlands. Species may occasionally fly over site on route to adequate habitat. No recent records within or in close proximity to the IA.
Falco hypoleucos	Grey Falcon	VU	Vulnerable	PMST	Y	Unlikely	Some suitable habitat present but no recent records. The species may fly over the site but not otherwise depend on habitats in the IA for their survival. A rare species in Victoria.
Falco subniger	Black Falcon		Critically Endangered	VBA (1999, 1)	Y	Unlikely	Some suitable habitat present but no recent records. The species may fly over the site but not otherwise depend on habitats in the IA for their survival. A rare species in Victoria.
Gallinago hardwickii	Latham's Snipe	Mi, Ma		PMST	N	Unlikely	No suitable habitat within the IA such as wet grasslands and swamps. Species may occasionally fly over site and occasionally use artificial dams on route to more adequate habitat. No recent records within or in close proximity to the IA.

Scientific Name	Common Name	Conservation Status		Source, (number of records, year of most recent record)	Habitat Present (Y/N)	Likelihood of Occurrence	Rationale
		EPBC Act	FFG Act				
Grantiella picta	Painted Honeyeater	VU	Vulnerable	PMST	N	Unlikely	No suitable habitat within the IA such as woodlands. No recent records within or in close proximity to the IA.
Hieraaetus morphnoides	Little Eagle		Vulnerable	VBA (1999, 4)	Y	Likely	Some suitable habitat present but no recent records. The species is likely to fly over and forage within the site, but given the high mobility of the species and availability of nearby habitat, it is unlikely to depend on habitat with in the IA.
Hirundapus caudacutus	White-throated Needletail	Vu, Mi, Ma	Vulnerable	PMST, VBA (1991, 5)	Y	Unlikely	Some suitable habitat present but no recent records. The species may use the air space above the site, but not reside, roost, or otherwise depend on habitats in the IA for their survival. No recent records.
Lathamus discolor	Swift Parrot	CR, Ma	Critically Endangered	PMST	N	Unlikely	Species mainly uses wooded areas but is regularly observed foraging on large flowering gums in urban areas. However, no recent records have been made within or in close proximity to the IA. Species is unlikely to use or depend on site
Lewinia pectoralis	Lewin's Rail		Vulnerable	VBA (1991, 1)	N	Unlikely	No suitable habitat within the IA such as the species prefers well vegetated wetlands and waterbodies, particularly swampy woodlands and wet heathlands, estuaries, saltmarshes, sedgelands, reedbeds and densely vegetated swamps. No recent records within or in close proximity to the IA.
Merops ornatus	Rainbow Bee-eater	Ma		VBA (1990, 3)	N	Unlikely	Species mainly uses forest and woodland habitat which is absent from the site. Species unlikely to depend on site but may occasionally visit from nearby woodland. Species is typically recorded from northern areas of the state. No recent records.

Scientific Name	Common Name	Conservation Status		Source, (number of records, year of most recent record)	Habitat Present (Y/N)	Likelihood of Occurrence	Rationale
		EPBC Act	FFG Act				
Motacilla flava	Yellow Wagtail	Mi, Ma		PMST	N	Unlikely	Species mainly uses grasslands that are subject to inundation which is absent from the site. Species unlikely to depend on site but may occasionally visit from nearby habitat. No recent records within or nearby IA.
Myiagra cyanoleuca	Satin Flycatcher	Mi, Ma		PMST	N	Unlikely	Species mainly uses forest and woodland which is absent from the site. Species unlikely to depend on site but may occasionally visit from nearby woodland. No recent records.
Numenius madagascariensis	Eastern Curlew	CR, Mi, Ma	Critically Endangered	PMST	N	Unlikely	No suitable habitat within the IA such as coastal lakes, mud flats and estuaries. No recent records within or in close proximity to the IA.
Pandion cristatus	Eastern Osprey	Mi, Ma		PMST	N	Unlikely	No suitable habitat such as coastal cliffs or adequate wetlands. No recent records within or nearby IA.
Pedionomus torquatus	Plains-wanderer	CR	Critically Endangered	PMST	Y	Unlikely	Some suitable habitat is present within the site such as grassland habitat. However, this species has largely declined in the Melbourne area and there are no recent records within or surrounding the IA.
Pyrrholaemus sagittatus	Speckled Warbler		Endangered	VBA (1990, 1)	N	Unlikely	Species mainly uses dry sclerophyll forests and woodlands which is absent from site. Species unlikely to depend on site but may occasionally visit from nearby woodland. No recent records.
Rhipidura rufifrons	Rufous Fantail	Mi, Ma		PMST	N	Unlikely	Species mainly uses forest and woodland habitat which is absent from the site. Species unlikely to depend on site but may occasionally visit from nearby woodland. No recent records.
Rostratula australis	Australian Painted Snipe	EN, Ma	Critically Endangered	PMST	N	Unlikely	No suitable habitat within the IA such as adequate wetlands. Species may fly over site and occasionally use artificial dams within IA on route to adequate

Scientific Name	Common Name	Conservation Status		Source, (number of records, year of most recent record)	Habitat Present (Y/N)	Likelihood of Occurrence	Rationale
		EPBC Act	FFG Act				
							habitat. No recent records within or in close proximity to the IA.
Stagonopleura guttata	Diamond Firetail		Vulnerable	VBA (1990, 2)	Y	Unlikely	Species mainly uses open grassy woodland or shrubland. Species unlikely to depend on site but may occasionally visit from nearby woodland. No recent records.
Thinornis cucullatus	Hooded Plover		Vulnerable	PMST	N	Unlikely	No suitable habitat within the IA such as sandy beaches and dunes. No recent records within or in close proximity to the IA.
Tringa nebularia	Common Greenshank	Mi, Ma	Endangered	PMST	N	Unlikely	No suitable habitat within the IA such as brackish wetlands, sewage ponds, salt marshes and estuaries. Species may occasionally fly over site and may briefly stop at dams on route to adequate habitat but not otherwise depend on the site. No recent records within or in close proximity to the IA.
Fish							
Galaxiella pusilla	Dwarf Galaxias	VU	Endangered	PMST	N	Unlikely	Unlikely to be present. Some suitable habitat in the form of drainage lines, dams and Taylors creek, but no recent records within or in close proximity to IA. Not typically recorded in the area.
Nannoperca obscura	Yarra Pygmy Perch	VU	Vulnerable	PMST	N	Unlikely	No suitable habitat within the IA such as moderate flowing small lakes and creeks. No recent records.
Prototroctes maraena	Australian Grayling	VU	Endangered	PMST, VBA (2002, 1)	N	Unlikely	No suitable habitat within the IA such as moderate to fast flowing creeks. No recent records.
Invertebrates							

Scientific Name	Common Name	Conservation Status		Source, (number of records, year of most recent record)	Habitat Present (Y/N)	Likelihood of Occurrence	Rationale
		EPBC Act	FFG Act				
Synemon plana	Golden Sun Moth	CR	Vulnerable	PMST	Y	Possible	Some suitable habitat such as grasslands. However, no recent records.
Mammals							
Dasyurus maculatus maculatus	Spot-tailed Quoll	EN	Endangered	PMST	N	Unlikely	Species extremely unlikely to occur in IA, extremely rare and locally extinct in most of historical distribution and is now restricted to remote areas of Victoria. No recent records.
Ornithorhynchus anatinus	Platypus		Vulnerable	VBA (1990, 8)	N	Unlikely	No suitable habitat within the project footprint, such as adequate wetlands and watercourses. No recent records.
Pteropus poliocephalus	Grey-headed Flying-fox	VU	Vulnerable	PMST	Y	Possible	Species is likely to fly over the IA as part of its wider ranging movements from the colony at Yarra Bend. May forage on fruiting trees within residential backyards in the surrounding landscape, or planted eucalypts in the IA. The species is otherwise unlikely to depend on the site with no nearby roosting colonies.
Reptiles							
Delma impar	Striped Legless Lizard	VU	Endangered	PMST, VBA (2018, 5)	Y	Likely / Present	Some suitable habitat present including NTGVVP. Recent records near proposed project footprint.
Tympanocryptis pinguicolla	Grassland Earless Dragon	EN	Critically Endangered	PMST, VBA (1990, 1)	Y	Unlikely	Extremely unlikely to be present within the site. Species is presumed extinct in Victoria.

Table 6 Flora likelihood Assessment Table

Scientific Name	Common Name	Conservation Status		Record #, (Year)	Habitat present (Y/N)	Likelihood of Occurrence	Rationale
		EPBC Act	FFG Act				
Allocasuarina luehmannii	Buloke		Vulnerable	VBA (2009, 1)	N	Unlikely	Species is typically found growling in woodland with Grey Box mainly north and west of the Great Dividing Range and within the Murray-Darling Basin. Therefore, is unlikely to naturally occur within the site. Not recorded during flora surveys.
Amphibromus fluitans	River Swamp Wallaby-grass	VU		PMST	Y	Possible	Some habitat available in the form of artificial dams and aquatic habitat of Taylors Creek. No recent records within or surrounding the IA
Comesperma polygaloides	Small Milkwort		Critically Endangered	VBA (1986, 1)	Y	Unlikely	Some habitat available such as intact grasslands dominated by Kangaroo Grass. However, no recent records within or nearby IA.
Coronidium gunnianum	Pale Swamp Everlasting		Critically Endangered	VBA (1986, 1)	Y	Possible	Habitat may be available such as grasslands prone to inundation. However, no recent records within or nearby IA.
Corymbia maculata	Spotted Gum		Vulnerable	VBA (2018, 3)	N	Unlikely	Species is a highly cultivated and planted species.
Cullen parvum	Small Scurf-pea		Endangered	VBA (2000, 10)	Y	Possible	Some habitat available such as intact grasslands subject to irregular flooding. However, no recent records within or nearby IA.
Cullen tenax	Tough Scurf-pea		Endangered	VBA (2000, 7)	Y	Possible	Some habitat may be available, species generally grows in drier areas within grasslands. No recent records within or nearby IA.
Dianella amoena	Matted Flax-lily	EN	Critically Endangered	PMST, VBA (2018, 1)	Y	Present	Species has been recorded within site as naturally occurring.

Scientific Name	Common Name	Conservation Status		Record #, (Year)	Habitat present (Y/N)	Likelihood of Occurrence	Rationale
		EPBC Act	FFG Act				
Dianella longifolia var grandis	Arching Flax-lily		Critically endangered	VBA (2014, 28)	Y	Present	Species has been recorded within site as naturally occurring.
Diuris basaltica	Small Golden Moths	EN	Critically Endangered	PMST	Y	Possible	Habitat may be available, such as intact grasslands. However, no recent records within or nearby IA.
Diuris fragrantissima	Sunshine Diuris	EN	Critically Endangered	PMST	Y	Unlikely	A rare and restricted species with sole remaining natural population occurring at Sunshine, where about 30 plants remain.
Dodonaea procumbens	Trailing Hop-bush	VU		PMST	Y	Possible	Species is known to grow in grasslands on clay-based soil which is present within the IA. However, no recent records within or surrounding the IA.
Eucalyptus leucoxylon subsp. *connata*	Melbourne Yellow-gum		Endangered	VBA (2014, 5)	N	Unlikely	Species prefers open woodlands which is absent from the IA. Species is a commonly cultivated tree.
Eucalyptus leucoxylon subsp. *megalocarpa*	Large-fruit Yellow-gum		Critically Endangered	VBA (2018, 2)	N	Unlikely	Species prefers open woodlands which is absent from the IA. Species is a commonly cultivated tree and not indigenous to the area.
Eucalyptus sideroxylon subsp. *sideroxylon*	Mugga		Endangered	VBA (2018, 1)	N	Unlikely	Species grows in wooded and forested area which are absent from the site.
Glycine latrobeana	Clover Glycine	VU	Vulnerable	PMST, VBA (1995, 1)	Y	Possible	Species may use intact grassland habitat within the IA. No recent records within or surrounding the IA.
Lachnagrostis adamsonii	Adamson's Blown-grass	EN	Endangered	PMST	N	Unlikely	Species prefers slightly saline and seasonally wet areas which are absent from the site. No recent records within or surrounding the site.
Lepidium hyssopifolium	Basalt Peppercress	EN	Endangered	PMST	Y	Possible/Unlikely	Species may use intact grassland habitat within the site and has also been recorded from disturbed weedy sites. However, there are no recent records within or surrounding the IA.

Scientific Name	Common Name	Conservation Status		Record #, (Year)	Habitat present (Y/N)	Likelihood of Occurrence	Rationale
		EPBC Act	FFG Act				
Leucochrysum albicans subsp. tricolor	Hoary Sunray	EN	Endangered	PMST	N	Unlikely	This species is rare in Victoria, recent records have been made in specific locations away from the IA, all other collections were made last century.
Melaleuca armillaris subsp. armillaris	Giant Honey-myrtle		Endangered	VBA (2018, 6)	N	Unlikely	Commonly cultivated species, non-indigenous, from the area.
Nicotiana suaveolens	Austral Tobacco		Endangered	VBA (2014, 3)	Y	Possible/Unlikely	Species is typically found drier inland areas, often in rocky or gravelled areas around rivers and streams which is absent from the site.
Pimelea spinescens subsp. *spinescens*	Spiny Rice-flower	CR	Critically Endangered	PMST, VBA (2020, 133)	Y	Present	Species has been recorded within the site as naturally occurring.
Podolepis linearifolia	Basalt Podolepis		Endangered	VBA (2015, 8)	Y	Possible	Species may utilise intact grasslands within the IA. Some recent records.
Pterostylis cucullata	Leafy Greenhood	VU		PMST	N	Unlikely	Species mostly occurs in coastal areas and rarely inland. Some recent records on volcanic soils, but no recent records within or surrounding the IA.
Rhagodia parabolica	Fragrant Saltbush		Vulnerable	VBA (2018, 13)	N	Unlikely	Species confined to steep rocky slopes and broad ridges, which is absent from the site.
Rutidosis leptorrhynchoides	Button Wrinklewort	EN	Endangered	PMST, VBA (2012, 1)	Y	Possible	Species may use intact grassland habitat within the IA.
Senecio macrocarpus	Large-headed Fireweed	VU	Critically Endangered	PMST, VBA (2018, 57)	Y	Likely	Species may use intact grassland habitat within the IA. A number of records exist in close proximity to the site.
Tripogonella loliiformis	Rye Beetle-grass		Endangered	VBA (2012, 6)	Y	Unlikely	An uncommon grass of scattered occurrence through drier areas of the state.
Xerochrysum palustre	Swamp Everlasting	VU	Critically Endangered	PMST	Y	Possible	Species typically grows sedge-rich lowland swamps and wetlands, usually on black cracking clay soils which is absent from the IA.

Appendix F – Vegetation Quality Assessment

Table 7 Habitat Hectare Table

Habitat Zone			HZ1	HZ2	HZ3	HZ4	HZ5	HZ6	HZ7	HZ8	HZ9	HZ10	HZ11	HZ12	HZ13*	HZ14*	HZ15*	HZ16*	HZ17*	HZ18*
EVC			Plains Grassland (132)	Plains Grassland (132)	Plains Grassland (132)	Plains Grassland (132)	Plains Grassland (132)	Plains Grassland (132)	Plains Grassland (132)	Plains Grassland (132)	Plains Grassland (132)	Plains Grassland (132)	Plains Grassland (132)	Plains Grassland (132)	Tall Marsh (821)	Plains Grassland (132)	Plains Grassland (132)	Plains Grassland (132)	Plains Grassland (132)	Plains Grassland (132)
Bioregion			VVP	VVP	VVP	VVP	VVP	VVP	VVP	VVP	VVP	VVP	VVP	VVP	VVP	VVP	VVP	VVP	VVP	VVP
Bioregional Conservation Status			E	E	E	E	E	E	E	E	E	E	E	E	LC	E	E	E	E	E
Site Condition	Large Old Trees	10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tree Canopy Cover	5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Lack of Weeds	15	6	9	0	4	2	6	6	4	4	0	0	0	4	7	7	7	7	7
	Understorey	25	10	10	5	10	5	10	5	5	5	5	5	5	5	5	5	5	5	5
	Recruitment	10	3	3	0	10	3	3	3	0	0	3	3	0	0	3	3	3	3	3
	Organic Litter	5	2	2	4	5	2	2	4	4	4	4	4	3	2	4	4	4	4	4
	Logs	5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total Site Score	75	11	24	9	29	12	21	18	13	13	12	12	8	11	19	19	19	19	19
Standardiser		-	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36
Standardised Site Score		-	15.0	32.6	12.2	39.4	16.3	28.6	24.5	17.7	17.7	16.3	16.3	10.8	15.0	26.0	26.0	26.0	26.0	26.0
Landscape Context	Patch Size	10	1	1	1	6	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Distance to Core Area	5	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0
	Neighbourhood	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total Landscape Score	25	2	2	2	7	2	2	2	2	2	2	2	2	1	1	1	1	1	1
Habitat Score		100	17.0	34.6	14.2	46.4	18.3	30.6	26.5	19.7	19.7	18.3	18.3	12.8	16.0	27.0	27.0	27.0	27.0	27.0
Habitat Points = Score/100		1	0.170	0.346	0.142	0.464	0.183	0.306	0.285	0.197	0.197	0.183	0.183	0.128	0.160	0.270	0.270	0.270	0.270	0.270
Total area of Habitat Zone (ha)			0.025	0.055	0.003	0.488	0.346	0.090	0.158	0.011	0.002	0.190	0.066	0.087	0.051	0.002	0.102	0.013	0.013	0.035
Habitat Hectares (Hha)			0.004	0.019	0.0004	0.226	0.063	0.028	0.045	0.002	0.0004	0.035	0.012	0.011	0.008	0.001	0.028	0.004	0.004	0.009

VVP = Victorian Volcanic Plain, E = endangered, LC = least concern
* scores adopted Biosis, 2022

Appendix G – Species Lists

Table 8 Investigation Area Weed List

Scientific name	Common name	Origin	CaLP or WoNS status
Arctotheca calendula	Capeweed	Introduced	
Aster subulatus	Wild Aster	Introduced	
Avena fatua	Wild Oat	Introduced	
Brassica sp.		Introduced	
Briza major	Quaking Grass	Introduced	
Bromus diandrus	Great Brome	Introduced	
Bromus hordeaceus	Soft Brome	Introduced	
Cynara cardunculus	Artichoke thistle	Introduced	CalP listed
Cynodon dactylon	Bermuda grass	Introduced	
Dactylis glomerata	Cocksfoot	Introduced	
Echium plantagineum	Paterson's curse	Introduced	CaLP listed
Ehrharta erecta	Panic veldtgrass	Introduced	
Foeniculum vulgare	Fennel	Introduced	CaLP listed
Galenia pubescens	Galenia	Introduced	
Helminthotheca echioides	Ox Tongue	Introduced	
Hordeum spontaneum	Wild Barley	Introduced	
Hypochaeris radicata	Cat's Ear	Introduced	
Juncus acutus	Spiny Rush	Introduced	CaLP listed
Lactuca serriola	Prickly Lettuce	Introduced	
Lolium perenne	Perennial Ryegrass	Introduced	
Lycium ferocissimum	African Boxthorn	Introduced	CaLP listed, WoNS
Malus domestica	Apple Tree	Introduced	
Melilotus indicus	Annual Yellow Sweetclover	Introduced	
Modiola caroliniana	Red Flowered Mallow	Introduced	
Nassella neesiana	Chilean Needle Grass	Introduced	CaLP listed, WoNS
Nassella trichotoma	Serrated Tussock	Introduced	CaLP listed, WoNS
Oxalis purpurea	Large-flower Wood-sorrel	Introduced	

Scientific name	Common name	Origin	CaLP or WoNS status
Oxalis sp.		Introduced	
Pelargonium sp.		Introduced	
Phalaris aquatica	Canary Grass	Introduced	
Physalis hederifolia	Ivyleaf groundcherry	Introduced	CaLP listed
Plantago coronopus	Buck's-horn plantain	Introduced	
Plantago lanceolata	Ribwort Plantain	Introduced	
Rumex sp.	Dock	Introduced	
Sonchus asper	Spiny sowthistle	Introduced	
Trifolium repens	White Clover	Introduced	
Vicia sativa	Common Vetch	Introduced	
Vulpia myuros	Annual Fescue	Introduced	

Table 9 Investigation Area Native Flora List

Scientific name	Common name	EPBC listing	FFG listing
Acacia paradoxa	Prickly Wattle		
Acaena echinata	Sheep's Burr		
Agrostis sp.			
Allocasuarina sp.	She-oak		
Atriplex semibaccata	Saltbush		
Atriplex sp.	Salt Bush		
Austrostipa sp.	Spear Grass		
Calocephalus citreus	Lemon Beauty Heads		Protected
Chrysocephalum apiculatum	Common Everlasting		Protected
Common Rice-flower	Pimelea humilis		
Dianella amoena	Matted Flax-lily	Endangered	Critically endangered, Protected
Dianella longifolia var. longifolia	Arching Flax-lily		
Dianella revoluta	Black-anther flax-lily		
Distichlis distichophylla	Australian Salt Grass		
Einadia nutans	Nodding Saltbush		

Scientific name	Common name	EPBC listing	FFG listing
Enchylaena tomentosa	Ruby Saltbush		
Eucalyptus camaldulensis	River Red Gum		
Helichrysum luteoalbum	Jersey cudweed		Protected
Juncus sp.	Sedge		
Oxalis perennans	Grassland Wood-sorrel		
Phragmites australis	Common Reed		
Pimelea spinescens subsp. spinescens	Spiny-rice flower	Critically endangered	Critically endangered, Protected
Rhagodia spinescens	Saltbush		
Rytidosperma sp.	Wallaby Grass		
Sclerolaena muricata	Black Rolypoly		
Themeda triandra	Kangaroo Grass		
Typha orientalis	Cumbungi		

Table 10 Investigation Area Fauna List

Scientific name	Common name	Origin
Acanthiza chrysorrhoa	Yellow Rumped Thornbill	Native
Accipiter fasciatus	Brown Goshawk	Native
Acridotheres tristis	Indian Mynah	Introduced
Alauda arvensis	Skylark	Introduced
Anthochaera carunculata	Red Wattle Bird	Native
Aquila audax	Wedge-tailed eagle	Native
Cacatua galerita	Sulphur-crested cockatoo	Native
Cacatua tenuirostris	Long-billed corella	Native
Carduelis	European Gold Finch	Introduced
Cisticola exilis	Golden Cisticola	Native
Common blue-tongued skink	Tiliqua scincoides	Native
Corvus mellori	Little Raven	Native
Crinia signifera	Common froglet	Native
Egretta novaehollandiae	White-faced heron	Native
Elanus axillaris	Black Shouldered Kite	Native

Scientific name	Common name	Origin
Eolophus roseicapilla	Galah	Native
Falco berigora	Brown Falcon	Native
Falco cenchroides	Nankeen Kestrel	Native
Glossopsitta concinna	Musk lorikeet	Native
Grallina cyanoleuca	Magpie Lark	Native
Gymnorhina tibicen	Australian Magpie	Native
Hirundo neoxena	Welcome Swallow	Native
Lepus europaeus	European Hare	Introduced
Lichenostomus penicillatus	White plumed Honey Eater	Native
Limnodynastes dumerilii	Banjo Frog	Native
Limnodynastes peronii	Striped Marsh Frog	Native
Limnodynastes tasmaniensis	Spotted Marsh Frog	Native
Macropus giganteus	Eastern Grey Kangaroo	Native
Malurus cyaneus	Superb Fairy Wren	Native
Notechis scutatus	Tiger snakes	Native
Ocyphaps lophotes	Crested Pigeon	Native
Oryctolagus cuniculus	European Rabbit	Introduced
Passer domesticus	House Sparrow	Introduced
Platycercus eximius	Eastern rosella	Native
Psephotus haematonotus	Red-rumped parrot	Native
Pseudemoia pagenstecheri	Tussock Skink	Native
Rhipidura leucophrys	Willie wagtail	Native
Spilopelia chinensis	Spotted Dove	Introduced
Sturnus vulgaris	Common Starling	Introduced
Trichoglossus moluccanus	Rainbow lorikeet	Native
Turdus merula	Common Black Bird	Introduced
Vanellus miles	Masked Lapwing	Native
Vulpes	Red Fox	Introduced

Appendix H – Natural Temperate Grassland of the Victorian Volcanic Plain Memorandum

Refer to LXRP-LX14-080-0-00-PA-MEM-0005

Appendix I – Spiny Rice-flower *Pimelea spinescens* subsp. *spinescens* Report

Refer to LXRP-LX14-080-0-00-PA-RPT-0001

Appendix J – Matted Flax-lily *Dianella amoena* Memorandum

Refer to LXRP-LX14-080-0-00-PA-MEM-0002

Appendix K – Clover Glycine *latrobeana* Memorandum

Refer to LXRP-LX14-080-0-00-PA-MEM-0003

Appendix L – Large-headed Fireweed *Senecio macrocarpus* Memorandum

Refer to LXRP-LX14-080-0-00-PA-MEM-0004

Appendix M – Striped Legless Lizard *Delma impar* Report

Refer to LXRP-LX14-080-0-00-PA-RPT-0005

Appendix N – Golden Sun Moth *Synemon plana* Report

Refer to LXRP-LX14-080-0-00-PA-RPT-0006

Appendix O – Growling Grass Frog *Litoria raniformis* Report

Refer to LXRP-LX14-080-0-00-PA-RPT-0007

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