Draft Report

EPBC 2018/8271: Environment Management Plan: Bacchus Marsh Development Project

Prepared for

Bacchus Marsh Developments Pty Ltd

October 2023

Ecology and Heritage Partners Pty Ltd

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Report versions	Comments	Comments updated by	Date submitted
Draft Version 1	EMP prepared in accordance with the Commonwealth's *Environmental Management Guidelines*	SLB	28/06/2022
Draft Version 2	EMP undated following comments by the Commonwealth on the draft version 1 report	SLB/CS	12/10/2023

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_____
Full name (please print)

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Organisation (please print)

_____/_____/_____
Date

EXECUTIVE SUMMARY

Ecology and Heritage Partners Pty Ltd was engaged by Bacchus Marsh Developments Pty Ltd to prepare an Environment Management Plan (EMP) as part of the response to the Commonwealth Department of Climate Change, Environment, Energy and Water (DCCEEW) request for Preliminary Documentation for the proposed residential development located across several parcels of land in Merrimu, Victoria (the study area) (EPBC 2018/8271).

This EMP has been prepared in accordance with the Commonwealth's *Environmental Management Plan Guidelines* (DoE 2014). Bacchus Marsh Developments or the nominated Development Manager is responsible for ensuring all actions detailed in this EMP are undertaken to ensure that any potential impacts to the retained population of the nationally significant Spiny Rice-flower *Pimelea spinescens* subsp. *spinescens*, the retained areas of *Natural Temperate Grassland of the Victorian Volcanic Plain* (NTGVVP) ecological community and retained habitat for Golden Sun Moth *Synemon plana* are adequately protected pre, during and post construction to avoid any direct or indirect impacts.

Bacchus Marsh Developments or the nominated Development Manager is responsible for ensuring all actions detailed in this EMP are undertaken to ensure the objectives are met. All contractors on site will be made aware of this EMP and their responsibilities regarding environmental management.

A series of mitigation measures will be implemented within and adjacent to the construction footprint prior to, and during the construction phase of the proposed development to ensure that proposed action does not impact on areas supporting retained matters of National Environmental Significance (NES) present outside of the construction footprint.

Bacchus Marsh Developments will ensure appropriate funding is made available to ensure the actions and objectives contained within this Plan are carried out to the satisfaction of the Commonwealth.

CONTENTS

1 INTRODUCTION

1.1 Background

Ecology and Heritage Partners Pty Ltd were commissioned by Bacchus Marsh Development Pty Ltd to prepare a response to the Commonwealth Department of Climate Change, Environment, Energy and Water (DCCEEW) request for Preliminary Documentation for the proposed residential development located across several parcels of land in Merrimu, Victoria (the study area) (EPBC 2018/8271) (Figure 1). This Environmental Management Plan (EMP) forms a part of the Preliminary Documentation response, detailing the measures to be implemented by the proponent to ensure the protection of any retained matters of National Environmental Significance (NES) identified within the study area.

This EMP has been prepared in accordance with the Commonwealth's *Environmental Management Plan Guidelines* (Department of the Environment [DoE] 2014). Bacchus March Development or the nominated Development Manager is responsible for ensuring all actions detailed in this EMP are undertaken to ensure that any potential impacts to the matters of NES recorded within the study area are mitigated against. The matters of NES recorded in the study area include Golden Sun Moth *Synemon plana* (GSM), Spiny Rice-flower *Pimelea spinescens* subsp. *spinescens* (SRF), and the *Natural Temperate Grassland of the Victorian Volcanic Plain* (NTGVVP) ecological community. The previous ecological surveys undertaken within the study area recorded significant numbers of GSM and SRF, and several hectares of NTGVVP (Ecology and Heritage Partners, 2018a;2018b).

This EMP specifically addresses how the matters of NES that are proposed to be retained within the study area will be protected from direct and indirect impacts during construction to ensure that the construction activities do not negatively impact the retained areas of matters of NES.

The actions within this EMP will commence as soon as this plan is approved.

1.2 Objectives

The objective of this EMP is to provide a series of management actions that will ensure that the retained SRF populations, GSM habitat and NTGVVP are managed as part of the proposed development to be undertaken within the study area to mitigate any potential impact to the matters of NES.

Specifically, this EMP has the following objectives:

- Identify the key threats posed to each matters of NES present and provide recommended mitigation measures;
- Ensure no construction impacts occur outside of the approved development footprint;
- Erect temporary no-go zone fencing around the retained matters of NES to prevent access;
- Install and maintain fencing and signage; and,
- Monitor the retained matters of NES to ensure that fencing and signage remains in good condition, and that no other potential impacts are addressed (i.e. litter, run-off, dust etc).

1.3 Study Area

The study area is in Bacchus Marsh, approximately 50 kilometres north-west of Melbourne's CBD, and comprises 16 properties covering approximately 435 hectares (Figure 1). The site is bound by Gisborne Road to the west and Bences Road to the east.

The land within and surrounding the study area predominantly supports agricultural activities in the form of grazing, cropping, market gardens, orchards, and vineyards. Two operating quarries are located immediately opposite the study area on the west of Gisborne Road, while the Long Forest Flora and Fauna Reserve is located to the east of Bences road near the study area (Figure 2). The study area is generally flat, with several escarpments located to the west and south of the study area. The headwaters of several designated waterways commence within the study area and follow the escarpments into lower lying areas to the east and west.

1.4 Matters of National Environmental Significance

The three matters of NES that were recorded within the study area are detailed in Figure 2 and summarised in Error! Reference source not found..

Table 1. Matters of National Environmental Significance proposed to be impacted and retained within the study area

Ecological Value	Impacted	Retained	Total
Golden Sun Moth	22.197	36.401	58.598
Spiny Rice Flower	0	2653	2653
NTGVVP	1.783	15.882	17.665 ha

1.4.1 Natural Temperate Grassland of the Victorian Volcanic Plain

The critically endangered NTGVVP ecological community was recorded within the study area (Figure 2). A total of 17.665 hectares of NTGVVP was recorded within the study area, of which 1.783 hectares is proposed to be impacted and 15.885 hectares is proposed to be retained. The impacted area will be offset through the protection of an on-site offset located within Property 16 within the study area, which contained a total of 14.456 hectares of NTGVVP. The remaining area of retained NTGVVP was located within Property 11, which contained 1.422 hectares of NTGVVP.

The key threats posed to the retained areas of NTGVVP within the study area include weed invasion, habitat loss/disturbance, changes to land management practices and poorly managed subdivisions.

1.4.2 Golden Sun Moth

Several populations of GSM were recorded within the study area. In total, 58.298 hectares of confirmed habitat was recorded within the study area, of which 22.657 hectares are proposed to be impacted and 35.750 hectares is proposed to be retained. The distribution of GSM habitat across the study area included 42.106 hectares located in Properties 1-15, and 16.193 hectares located in Property 16. Of this, a total of 21.04 hectares will be legally protected across three on-site offset areas, one located east of Bences Road (Property 16), one located south of Buckleys Road (part of Property 6) and one located north of Bucklers Road (part of Property 5) (Figure 2).

The retained patches of GSM habitat are exposed to several key threats as a result of the proposed action. These include soil disturbance, weed invasion and land clearing.

1.4.3 Spiny Rice-flower

A total of 2,653 individuals of SRF were recorded within the study area. No impacts are proposed to any individuals of SRF, with all individuals occurring within retained areas of native vegetation. The populations of SRF were recorded within Property 11 and Property 16 (Figure 2).

The key threats to SRF as a result of the proposed action include weed invasion, changing land use and road maintenance.

2 MANAGEMENT PLAN

This section of the report presents the actions required to mitigate potential impacts to the areas of retained SRF, NTGVVP and GSM habitat within the study area prior to, and during construction.

It is essential to control the spread of weeds and introduced species within these areas during construction, and retain the ecosystem in its most natural state to enhance the habitat for the persistence of SRF, GSM habitat and the NTGVVP community.

In combatting introduced grasses and weeds, particularly Serrated Tussock *Nassella trichotoma*, Chilean Needle-grass *Nassella neesiana* and African Box-thorn *Lycium ferocissimum* which are known to occur within the study area and are highly invasive, it should be recognised that there may be some temporary impacts to the NTGVVP community and habitat for SRF and GSM, and that management actions must be conducted in a phased approach. Adaptive and flexible management will therefore play a critical role in the ongoing success of the managing the retained matters of NES.

It should be noted that retained GSM habitat located in Property 5 and 6, as well as Property 16 (Figure 2) is proposed to be established as legally protected offset sites and managed for conservation purposes. Ecology and Heritage Partners have prepared an Offset Management Plan (OMP) (Ecology and Heritage Partners 2023) that details the proposed management actions to be undertaken within these areas.

Appendix 1 provides a risk assessment assessing the effectiveness of this EMP against potential events.

2.1 Roles and Responsibilities

Bacchus Marsh Development or the nominated Development Manager is responsible for ensuring all actions detailed in this EMP are undertaken to ensure the objectives are met.

Bacchus Marsh Development will ensure appropriate funding is made available to ensure the actions and objectives contained within this Plan are carried out to the satisfaction of DCCEEW.

2.2 Key Threats to Matters of NES

The key threats identified to each matter of NES and the recommended mitigation approach to address the threat is provided below (Table 2). The key threats are based off the Conservation Advice and/or National Recovery Plan available for each matter of NES present that are likely to result to a negative impact to the matter of NES if mitigation measures are not implemented (Department of the Environment, Water, Heritage and the Arts [DEWHA 2008]; DoE 2013; Department of Sustainability and Environment [DSE] 2006). Classification of risk is provided in Appendix 1. Additional threats and proposed mitigation measures are addressed in Section 2.3.

Table 2. Key threats and proposed mitigation to retained matters of NES within the study area.

Threat	Matter of NES	Risk without mitigation	Proposed Mitigation	Risk with mitigation
Weed invasion	NTGVVP, SRF and GSM habitat	Likely - Increase in weed cover with areas supporting retained matters of NES leading to a decrease in quality may result from unhygienic practices, unrestricted access and lack of monitoring or management of retained areas.	• Undertake baseline survey within retained areas of NES to record current weed cover and species present • All machinery and vehicles entering site to be free of soil/weed propagules • Any fill brought into site must be free of weed propagules • Establish vehicle wash-down bays • Erect temporary fencing to establish no-go zones around retained areas of NES when works occur within 300 meters of the retained values • Monitor the retained areas of NES at a minimum once per fortnight to ensure that the cover of weeds does not increase, and that no new species emerge, • Engage qualified contractor to undertake weed control works within the retained areas of NES if new infestations or new weed species are observed.	Rare– The mitigation measures proposed prevent an increase in cover or introduction of any new weeds into the areas supporting retained matters of NES through the implementation of hygiene measures, access restrictions, monitoring and active weed management (where required).
Habitat loss/land clearing/soil disturbance	NTGVVP, SRF and GSM habitat	Likely – Disturbance to areas supporting retained matters of NES may result from vehicle/machinery damage, stockpiling, grading and lack of monitoring of retained areas.	• Erect temporary fencing to establish no-go zones around retained areas of NES when works occur within 300 meters of the retained values • Monitor the retained areas of NES a minimum of once per week to ensure that no habitat loss/land clearing/soil disturbance has occurred	Rare – The mitigation measures proposed prevent access into the areas supporting retained matters of NES through the establishment of no-go fencing when works are within proximity to the retained values. Frequent monitoring will ensure the no-go fencing remains in good condition and no damage has occurred.

2.3 General Mitigation Measures during Construction

A series of mitigation measures will be implemented within the construction areas prior to, and during the construction of the proposed development to ensure that development activities do not impact on the retained matters of NES. The following sections outline the general mitigation measures will be implemented.

2.3.1 Environmental Training

Site Inductions

All staff and contractors on site will be made aware of this EMP and their responsibilities regarding environmental management. As such, all staff will attend an environmental site induction, which will inform contractors of the requirements of this EMP. All main contractors undertaking works will be provided with a copy of the EMP, which will include maps of the development footprint, areas supporting retained matters of NES, offset areas, and other areas of retained vegetation.

Signage

Signage will be placed around construction offices to highlight the location and significance of the NTGVVP, GSM and SRF areas. Additional signage will be placed on all no-go zone fencing where retained native vegetation and GSM habitat occurs, to notify of the value being protected by the fencing.

2.3.2 Protection of Retained Matters of NES

Without active management and appropriate fencing, unrestricted access into the retained areas of native vegetation and GSM habitat site by vehicles, machinery and personnel may result in a loss of native vegetation cover, soil disturbance and compaction, and weed facilitation.

During the construction phase, areas containing matters of NES to be retained near the development footprint will require protection, which will be undertaken through the following management and mitigation measures:

- Permanent fencing will be erected around all areas identified in Figure 2 (Ecological Protection Fencing) prior to the commencement of works. Particular care must be taken to ensure that the construction of the fence has a minimal impact to the retained areas (i.e. no materials or soil stock piling, no vehicle parking within the retained area);
- The permanent fencing will be monitored on a weekly basis to maintain integrity. Damage to fences (i.e. gaps, holes) will be repaired immediately upon discovery
- Temporary fencing (e.g. star-picket bunting) will be placed along the outer extent of the active construction area to prevent any access into surrounding areas located outside of the construction footprint for the duration of the works in that location. Fencing must be inspected daily to ensure it remains in good condition and the location of the fencing is not moved;
- All contractors will be aware of ecologically sensitive areas as part of the site induction process during the construction phase to minimise the likelihood of inadvertent disturbance to areas marked for

retention. Areas supporting retained matters of NES must be included as a mapping overlay on any construction plans;

- Construction stockpiles, machinery, construction roads, and other infrastructure will be placed in pre-determined locations (e.g. laydown areas), away from areas supporting retained matters of NES;
- Any areas disturbed on the edges of the retained areas should be revegetated/direct seeded with local provenance flora species from the relevant Ecological Vegetation Class (e.g. Plains Grassland) to prevent the establishment of weeds adjacent to the retained areas; and,
- Ensure that best practice sedimentation and pollution control measures are undertaken at all times, in accordance with the relevant Environmental Protection Authority Victoria (EPA) guidelines (EPA 2020a; EPA 2020b) to prevent offsite impacts to waterways and wetlands.

2.3.3 *Weed Management*

Contaminated vehicles and plant equipment may result in the spread of weed species within and adjacent to the development area during construction. The construction process is likely to result in areas of disturbed bare ground, providing an opportunity for weeds to recruit and establish within the impact area. It is expected that all vehicles and plant equipment accessing the site for both pre-construction, construction and post construction purposes will be free of weeds and soil contamination and recommended that areas of bare ground be monitored for weed infestations during and post construction. Any weed infestations that develop during construction must be treated appropriately to prevent further spread into the surrounding landscape.

The below actions will assist in limiting the spread of weeds into the retained areas.

- A vehicle wash down area will be established on site for periodic cleaning of excess soil and organic matter (as required);
- Any areas scheduled for rehabilitation or landscaping will be restored as soon as possible with indigenous plant species. This is to minimise the window of soil disturbance that could facilitate the spread or establishment of plant diseases and pest plants, and to ensure that non-indigenous plants are not introduced into the local area;
- Ongoing weed management will be carried out by a qualified weed contractor. The contractor and the Environmental Manager will continue to monitor the site to identify the establishment of new weeds and implement control actions accordingly.

During the construction process, monitoring will be required on a fortnightly basis within the active construction area and within the retained areas of matters of NES to document any new and emerging weeds, to allow rapid control and prevent infestations occurring. If new weed infestations are identified during the post construction monitoring, Bacchus Marsh Developments must ensure the infestation is treated (e.g. sprayed).

2.3.4 *Pest Animal Control*

Cats and foxes may predate locally common fauna, and these two species should be the target of a pest animal control program within the retained areas of native vegetation and fauna habitat. European Rabbits remain a threat for the regeneration/recruitment of native species throughout western Victoria. The

landowner/contractor is to monitor pest animal use within the retained areas whilst undertaking routine monitoring of the retained areas. Any changes in the influences of pest animals may require a change in the management actions.

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

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

All pest animal control needs to be undertaken by suitably qualified contractors familiar with the ecology of the Victorian Volcanic Plain. Inappropriate pest animal control techniques may lead to off target damage or the wrong species being targeted. The sensitivities of the site should be considered with all management actions and all contractors entering the site need to be made aware of the values. The pest animal contractor will be responsible preparing and undertaking an adaptive management plan for the monitoring and eradication of pest animals from the retained areas.

2.3.5 Dust Suppression

Dust is generated through exposure of dry soils and agitation through either construction activities (e.g. moving soils, vehicle and machinery movements) or by high winds that enable soil particles to become airborne. Construction activities and exposure of topsoil is likely to increase dust levels, which can pose a hazard to air quality. The following measures will be implemented to reduce dust levels as a result of construction activities (EPA 2004):

- Phase the work program to minimise land disturbance and retain vegetation where possible throughout the construction period;
- Stabilise exposed soil (stabilisation matting, mulch, progressive revegetation, roughen surface of exposed soil);
- Watering exposed soil and access tracks. Frequency of watering will be determined by weather conditions (e.g. dry, windy days likely to generate more dust), with a watercart to be maintained on site during dusty conditions;
- Dust suppression controls must be monitored on a weekly basis to ensure effectiveness; and,
- Protect soil stockpiles by applying the following measures:
    - Cover stockpiles with geotextile, stabilisation matting or other suitable material (where practicable);
    - Provision of slit fencing on the low side of each stockpile;
    - No stockpiles are to be located outside of the construction area;
    - Minimise the number and size of stockpiles; and,
    - Maximum 2:1 height to width ratio for soil stockpiles.

2.3.6 Erosion and Sedimentation

Construction activities (e.g. soil excavation) may increase the potential for erosion and sedimentation and can pose a significant hazard to water quality. Measures employed for dust suppression are also effective as erosion and sedimentation controls. In addition to the measures outlined for dust suppression (Section 2.3.5), the following measures may be appropriate to further reduce erosion and sedimentation into area of retained vegetation (EPA 2004):

- Install sediment retention structures to divert flow away from exposed soils and prevent contaminated stormwater from accessing waterways. Such structures may include slit fences, straw bales, coir logs, rock or gravel, catch drains, earth banks, slopes and batters and rock bunds. A wide range of sediment retention structures are described in detail in EPA (2004); and,
- Monitor sedimentation controls on a weekly basis to ensure effectiveness.

Where there is potential for sediments to flow onto GSM habitat proposed to be retained (Figure 3) during construction, an appropriate sediment retention structure will be installed around the boundary of the GSM habitat area (or conservation area boundary if this is closer to the development interface and/or more effective) to ensure sediments do not flow over the soil proposed for GSM habitat retention. Similarly, the chosen sediment retention structure/s must no impede water flow within the retained GSM habitat area and allow water to flow across the surface as per normal.

2.3.7 Waste Management

Construction activities will involve the use of fuels, lubricants, chemicals and construction waste materials that pose a risk to soil, waterways and groundwater contamination. Measures to reduce the risk of waste materials include:

- A designated set down area of vehicle and equipment storage, vehicle refuelling and dumping of contaminated waste will be established prior to commencement of construction activities. The area must (EPA 2004):
    - Be located away from drainage lines, stormwater inlets, waterways, areas of significant flora and fauna and other sensitive areas identified on site;
    - Be appropriately bunded to contain all contaminated water; and,
    - Be clearly signed for easy identification.
- All waste material will be contained (within suitable skips onsite) and cleaned on a regular basis to ensure skips do not overflow and litter does not enter surrounding residential areas;
- Appropriate methods of disposal for wastes are dependent on the classification of the waste material and are detailed in the Waste Classification Assessment Protocol (EPA 2021); and,
- The construction contractor will be made aware of their responsibility to keep the construction zone clean during construction, which is to be outlined within a relevant site induction.

2.3.8 Fire Management

The potential for a fire to start within a works area can be particularly high in grassland and vegetated areas. The contractor will be made aware of the following safety procedures to minimise the risk of fire:

- All vehicles and machinery will be parked in designated parking areas (where appropriate);
- All staff will be made aware of the declared Fire Danger Period and days of Total Fire Ban;
- Weather conditions will be monitored during periods of high fire danger, such as windy or very hot days;
- Adequate fire suppression equipment will be on-site as per the requirements of Regulation 109 and 110 of the Country Fire Authority Regulations 2004. The contractor's personnel will be made aware of the location and operation of this equipment; and,
- The site manager will be supplied with the contact number for the local CFA unit.

  Country Fire Authority (CFA Bacchus Marsh)

  Address: 93 Main Street, Bacchus Marsh, Victoria 3340

  CFA Headquarters phone: (03) 9262 8444, Emergency phone: 000

2.3.9 Environmental Emergency Response

All steps will be undertaken to avoid an environmental emergency/incident, however in the event one does occur, the Development Manager shall take all necessary steps to manage the response.

Notifiable incidents are defined as '*a pollution incident that causes or threatens to cause material harm to human health or the environment*' (EPA 2023). These incidents include situations, or potential situations, where (EPA 2023):

- There is an adverse effect on human health or the environment.
- There is an adverse effect on an area of high conservation value or of special significance.
- The clean-up or management of the pollution or cost of restoration would cost $10,000 or more.

A worker at the scene of the incident will contact the EPA on 1300 372 842 to report the incident if any of the above three criteria apply.

2.4 Management and Monitoring

Management and monitoring of the areas supporting retained matters of NES will be undertaken respectively by a suitably bushland contractor and qualified ecologist as per the requirements detailed in the OMP (Ecology and Heritage Partners 2023). As part of the monitoring of the proposed offset sites, the retained area of NTGVVP and SRF population located in Property 11 will also be included in the reporting requirements.

As detailed in the OMP, monitoring and progress reports will include the following:

- Collection of baseline data to be used as a reference point to assess the impacts of mitigation actions;
- Overall condition and composition of native vegetation within each retained area;
- The extent, severity, trend and presence of current weed species and any new and emerging weed species; and,

- Implementation of permanent photo points. Photographs must be taken at the same location and during the same time of each year. Photo points will allow monitoring of weed populations and maintenance of the current condition of native vegetation within the offset site. Details of photo points and photographs will be provided to DCCEEW where required as evidence of progress.

REFERENCES

DEWHA 2008. Approved Conservation Advice for the Natural Temperate Grassland of the Victorian Volcanic Plain. Canberra: Department of the Environment, Water, Heritage and the Arts, Canberra, ACT.

DoE 2013. Approved Conservation Advice for *Synemon plana* (golden sun moth). Canberra: Department of the Environment. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/25234-conservation-advice.pdf.

DoE 2014. Environmental Management Plan Guidelines. Commonwealth Department of the Environment. Canberra, ACT.

DSE 2006. National Recovery Plan for the Spiny Rice-flower *Pimelea spinescens* subsp. *spinescens.* Prepared by Oberon Carter and Neville Walsh. Victorian Department of Sustainability and Environment, East Melbourne, Victoria.

Ecology and Heritage Partners 2018a. Targeted Surveys for Golden Sun Moth *Synemon plana* and Striped Legless Lizard *Delma impar*: Bacchus Marsh Development Project, Bacchus Marsh, Victoria. Report prepared for Bacchus Marsh Developments. June 2018.

Ecology and Heritage Partners 2018b. Ecological Assessment: Bacchus Marsh Development Project, Victoria. Report prepared for Bacchus Marsh Developments Pty Ltd. July 2018.

Ecology and Heritage Partners 2023. EPBC 2018/8271: Offset Management Plan, Merrimu, Victoria. Prepared for Bacchus Marsh Developments Pty Ltd, Ascot Vale, Victoria.

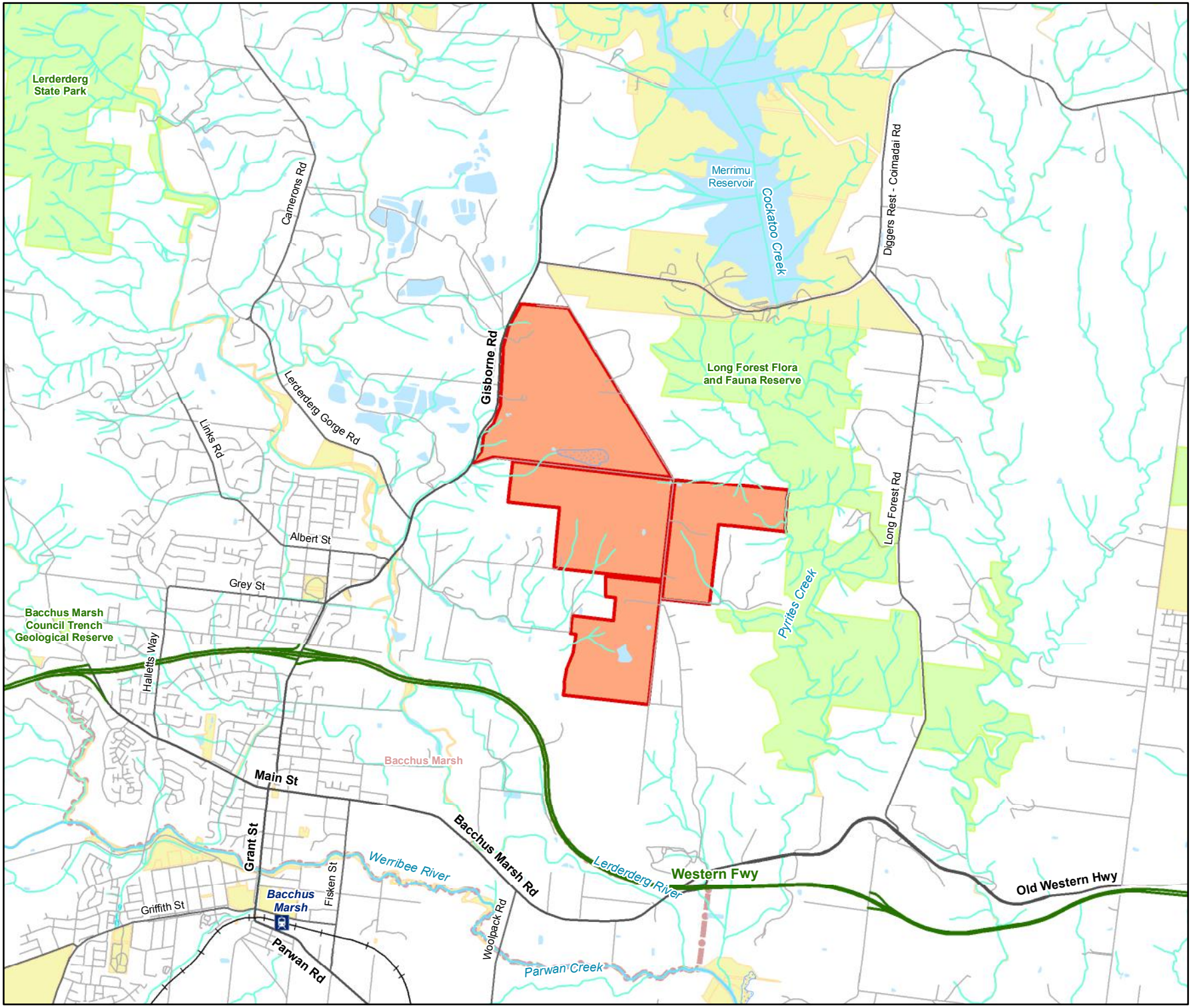
EPA 2004. Temporary Environmental Protection Measures for Subdivisions Construction Sites. Published document prepared by the Victorian Environmental Protection Authority, Victoria. Melbourne.

EPA 2020a. *Civil construction, building and demolition guide*. Publication 1834. Published document prepared by the Victorian Environmental Protection Authority, Melbourne, Victoria.

EPA 2020b. *Erosion, sediment and dust: Treatment train*. Publication 1893. Published document prepared by the Victorian Environment Protection Authority, Melbourne, Victoria.

EPA 2021. Waste Classification Assessment Protocol. Published document prepared by the Victorian Environmental Protection Authority Victoria. Melbourne, Victoria.

EPA 2023. Environmental incident and emergency response. [www Document]. URL: https://www.epa.vic.gov.au/for-business/find-a-topic/environment-protection-laws-and-regulations/implementing-the-general-environmental-duty---a-guide-for-licence-holders/environmental-incident-and-emergency-response. Victorian Environment Protection Authority, Melbourne, Victoria.



Legend

- Study Area
- Railway
- Freeway
- Major Road
- Collector Road
- Minor Road
- Minor Watercourse
- Major Watercourse
- Permanent Waterbody
- Land Subject to Inundation
- Wetland/Swamp
- Parks and Reserves
- Crown Land
- Localities

Figure 1

Location of the study area

Ecological Assessments for the Bacchus Marsh Development Project

N

0 600 1,200

Metres

ecology & heritage partners

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10937_Fig01_StudyArea_fr9198 31/01/2019 psorensen

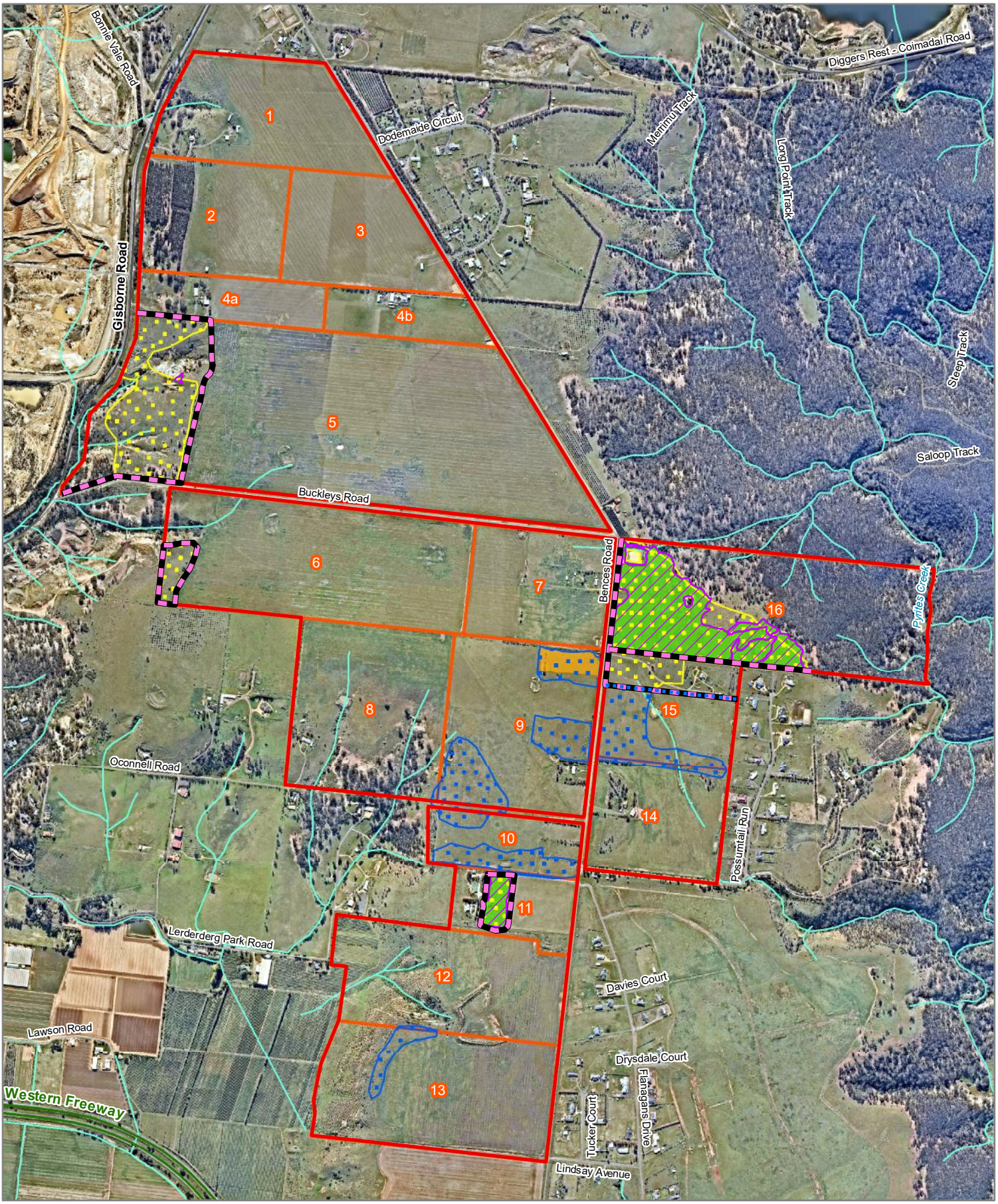

Figure 2 Overview

MNES Environmental Management Plan

Bacchus Marsh Development Project

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Legend

- Study Area
- Properties
- Proposed lot division
- Ecological Protection Fencing
- Areas that support Spiny Rice-flower
- Golden Sun Moth habitat proposed to be removed
- Golden Sun Moth habitat proposed to be retained

EPBC listed vegetation community

- Natural Temperate Grassland of the Victorian Volcanic Plain proposed to be removed
- Natural Temperate Grassland of the Victorian Volcanic Plain proposed to be retained

N

0 150 300

Metres

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10937_Fig02_MNES_EMP_PMB 28/09/2023 melsley

Aerial source: Nearmap 2020

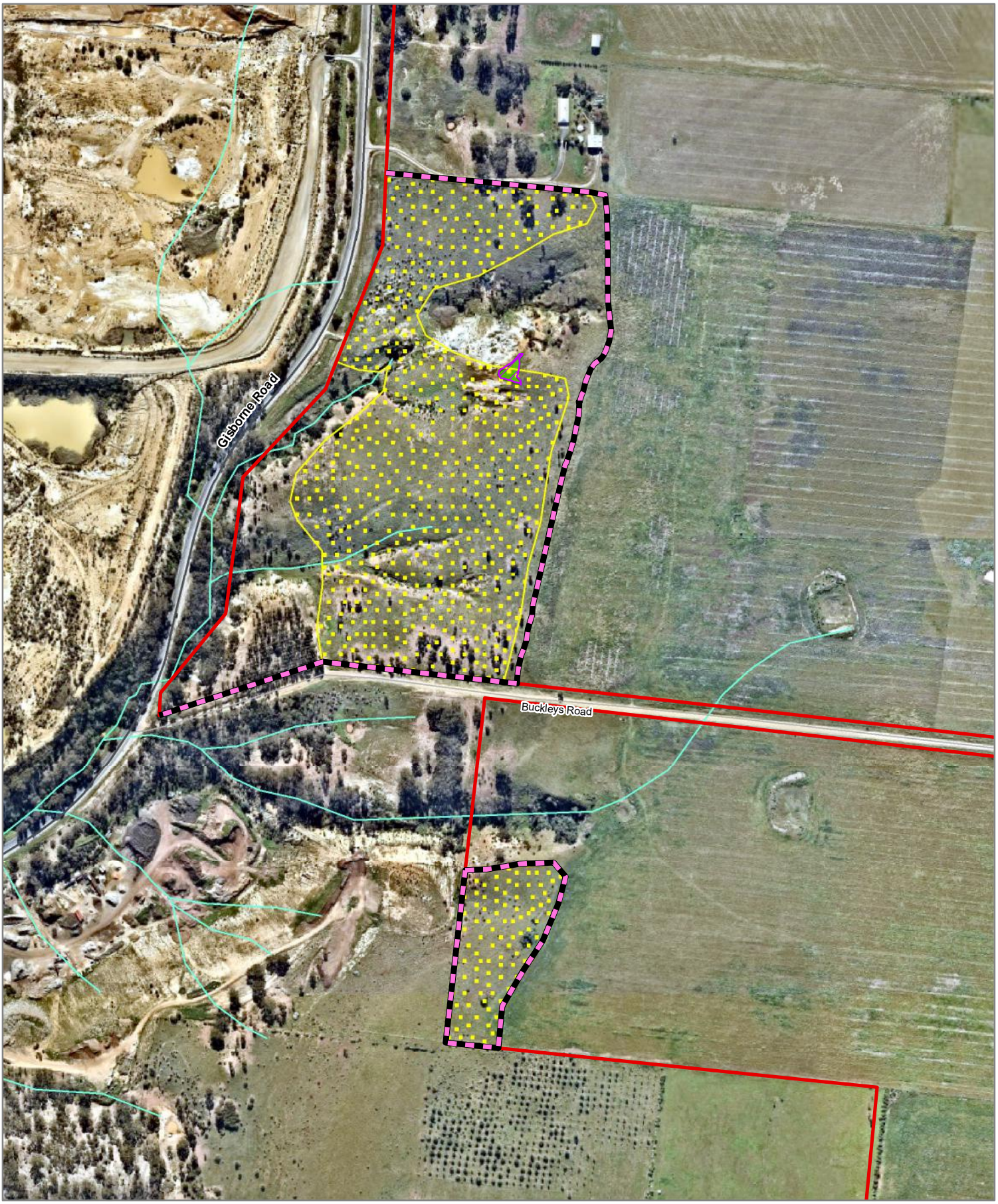


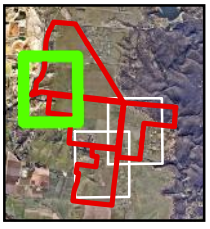
Figure 2a
MNES Environmental Management Plan
Bacchus Marsh Development Project

Legend

- Study Area
- Ecological Protection Fencing
- Areas that support Spiny Rice-flower
- Golden Sun Moth habitat proposed to be retained

EPBC listed vegetation community

- Natural Temperate Grassland of the Victorian Volcanic Plain proposed to be retained



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Aerial source: Nearmap 2020

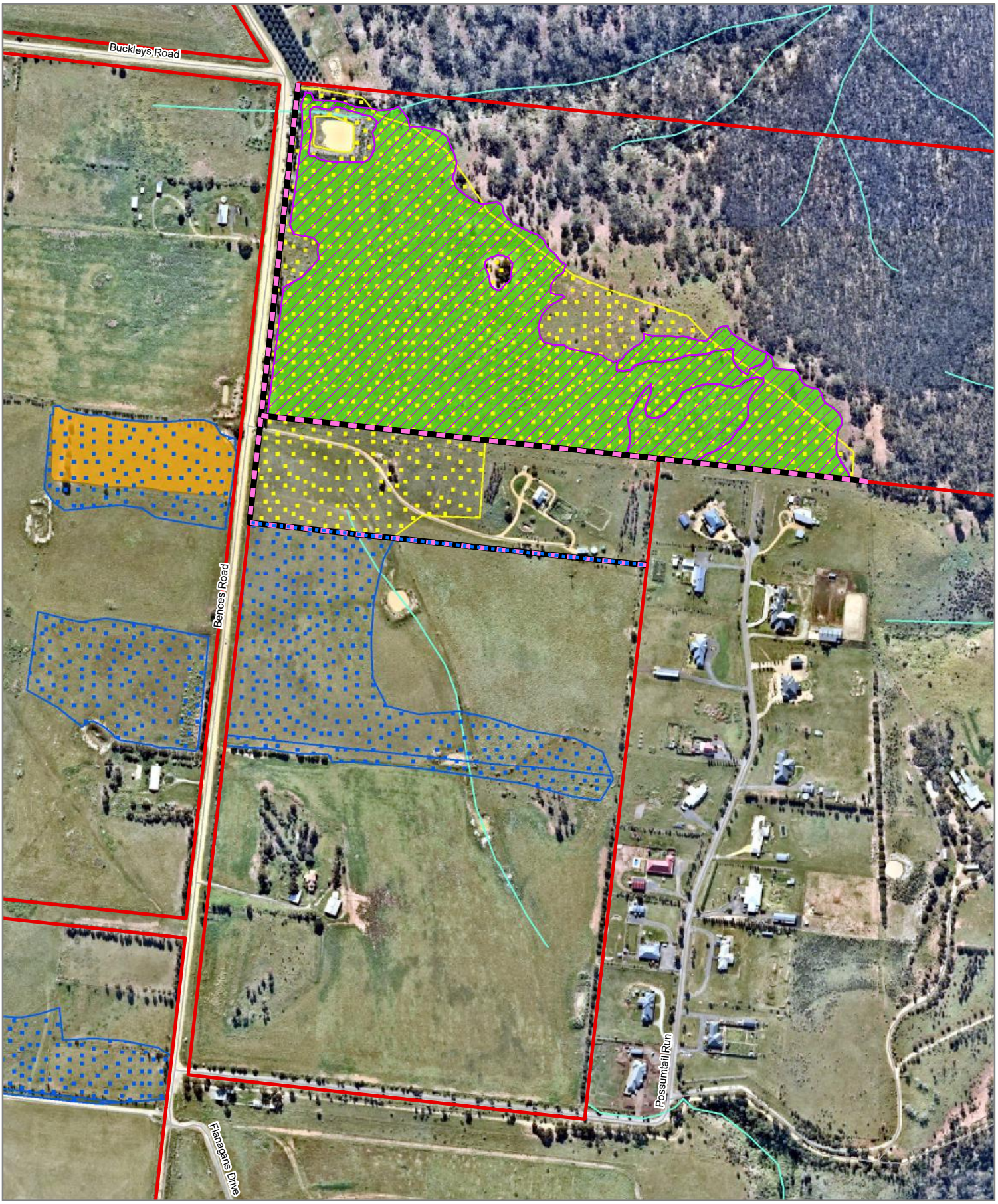

Figure 2b
MNES Environmental Management Plan
Bacchus Marsh Development Project

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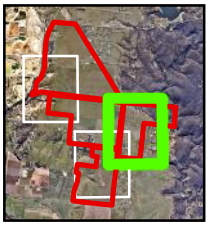
Legend

- Study Area
- Proposed lot division
- Ecological Protection Fencing
- Areas that support Spiny Rice-flower
- Golden Sun Moth habitat proposed to be removed
- Golden Sun Moth habitat proposed to be retained

EPBC listed vegetation community

- Natural Temperate Grassland of the Victorian Volcanic Plain proposed to be removed
- Natural Temperate Grassland of the Victorian Volcanic Plain proposed to be retained



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Aerial source: Nearmap 2020

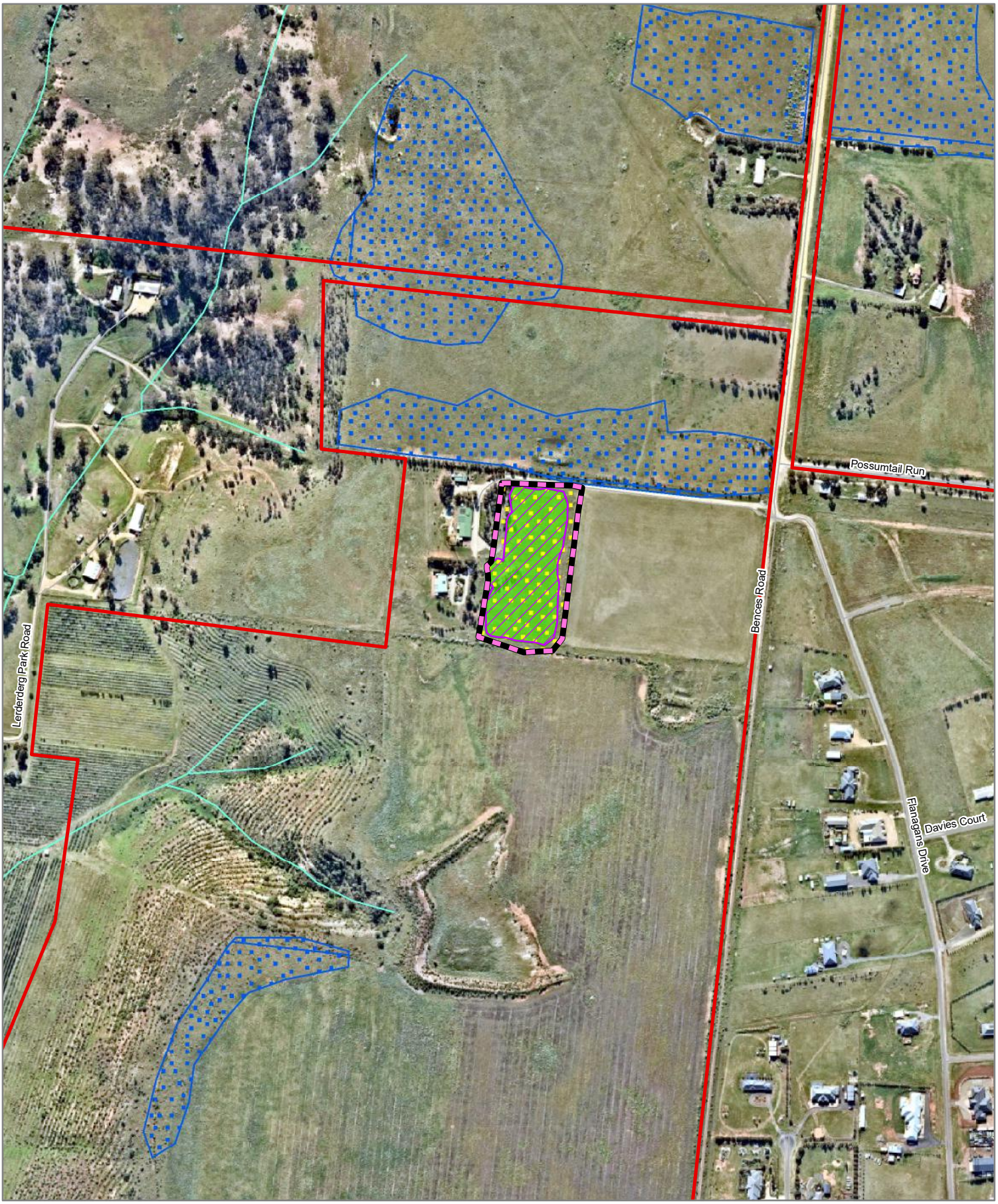


Figure 2c
MNES Environmental Management Plan
Bacchus Marsh Development Project

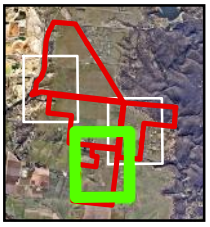
ecology & heritage partners

Legend

- Study Area
- Ecological Protection Fencing
- Areas that support Spiny Rice-flower
- Golden Sun Moth habitat proposed to be removed
- Golden Sun Moth habitat proposed to be retained

EPBC listed vegetation community

- Natural Temperate Grassland of the Victorian Volcanic Plain proposed to be retained



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Aerial source: Nearmap 2020

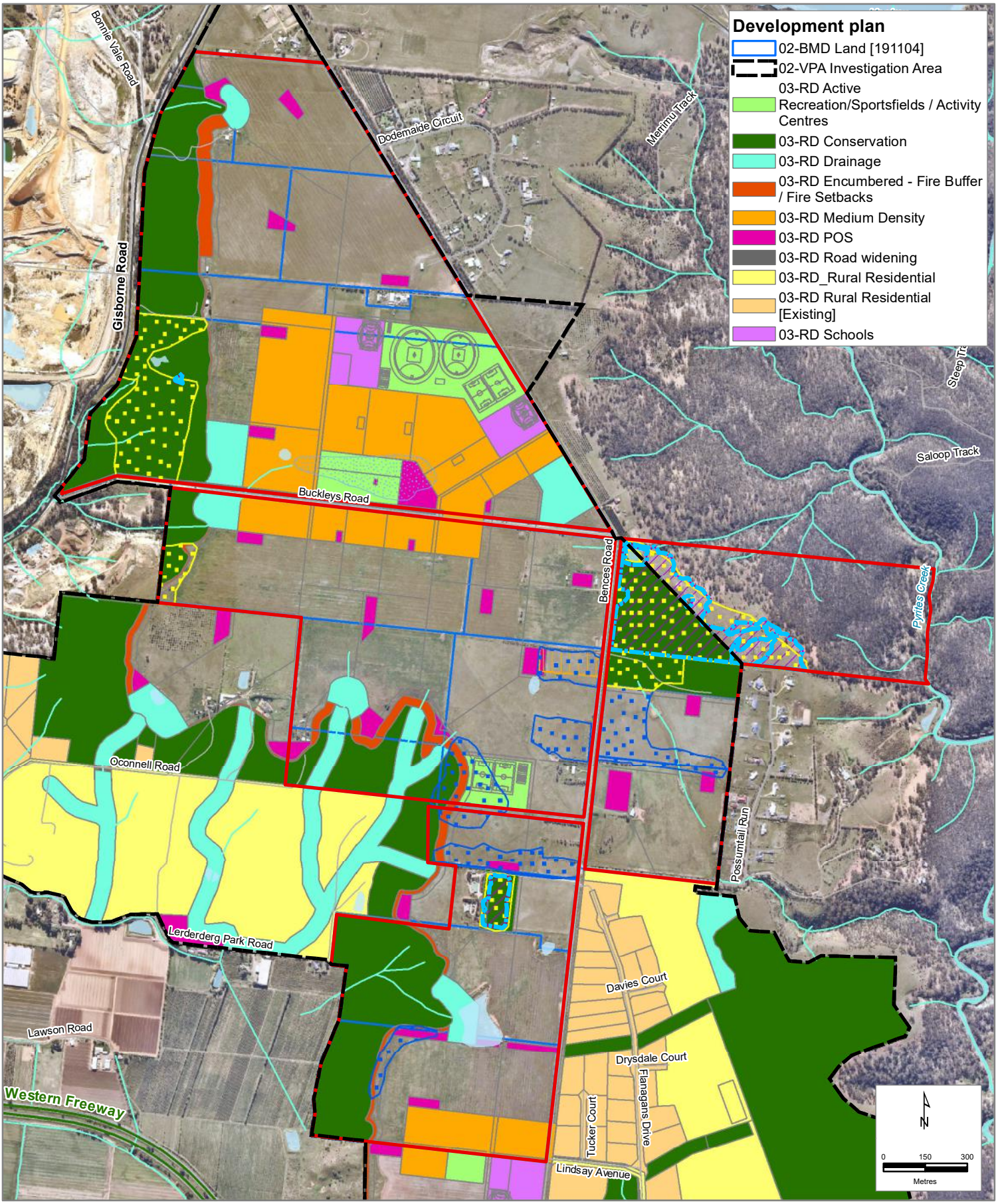

Figure 3
Develoment plan and MNES
Bacchus Marsh Development Project

Legend

- Study Area
- Areas that support Spiny Rice-flower
- Golden Sun Moth habitat proposed to be removed
- Golden Sun Moth habitat proposed to be retained

EPBC listed vegetation community

- Natural Temperate Grassland of the Victorian Volcanic Plain proposed to be removed
- Natural Temperate Grassland of the Victorian Volcanic Plain proposed to be retained

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Aerial source: Nearmap 2020

APPENDIX 1. RISK ASSESSMENT

Appendix 1.1. Risk Assessment

Table A1.1. Risk assessment table for Environmental Management Plan.

Management objective/desired outcome	Event or circumstance	Relevant management actions/measures	Residual risk			Trigger detection and monitoring activity/ies	Feasible/effective corrective actions	Notes
			L	C	RR			
To protect retained areas supporting matters of NES	EMP fail to adequately address objectives	Engage an expert to manage this process. Ensure all impacts are suitably confined to construction area.	Unlikely	High	Medium	Reduction in extent and quality of retained areas of matters of NES	Stop works. Ensure all actions within the EMP are correctly implemented	The erection of fencing will delineate the construction footprint from all retained matters of NES
	Adjacent land management practices fail to support attainment of objectives	Ensure understanding of EMP objectives. All contractors inducted onto site made aware of values outside the construction footprint	Unlikely	Moderate	Low	Adjacent land practices begin to negatively impact retained matters of NES	Take steps to halt negative impacts. Follow up with stakeholder discussions	Based on the current land management practices in the region and it is unlikely that any foreseeable land management practices within the vicinity will impact the retained matters of NES
	Insufficient funds provided by approval holder to implement the plan.	Ensure reputable land holder to implement plan.	Unlikely	Moderate	Low	Mitigation measures not being undertaken	Review plan for cost efficiencies.	The proponent will abide by the actions detailed in the EMP.
	Unintended impacts to retained areas	Stop works. Review EMP. Plan for scheduling delays.	Possible	Moderate	Medium	Monitoring and/or annual reporting	Take steps to halt negative impacts. Follow up with stakeholder discussions	The erection of no-go fencing around the retained areas will delineate the retained areas from the impact footprint.

Appendix 1.2. Risk Assessment and Management Definitions

Risk framework

		Consequence				
		Minor	Moderate	High	Major	Critical
Likelihood	Highly Likely	Medium	High	High	Severe	Severe
	Likely	Low	Medium	High	High	Severe
	Possible	Low	Medium	Medium	High	Severe
	Unlikely	Low	Low	Medium	High	High
	Rare	Low	Low	Low	Medium	High

Likelihood and consequence

Qualitative measure of likelihood (how likely is it that this event/circumstances will occur after management actions have been put in place/are being implemented)	
Highly likely	Is expected to occur in most circumstances
Likely	Will probably occur during the life of the project
Possible	Might occur during the life of the project
Unlikely	Could occur but considered unlikely or doubtful
Rare	May occur in exceptional circumstances
Qualitative measure of consequences (what will be the consequence/result if the issue does occur)	
Minor	Minor risk of failure to achieve the plan's objectives. Results in short term delays to achieving plan objectives, implementing low cost, well characterised corrective actions.
Moderate	Moderate risk of failure to achieve the plan's objectives. Results in short term delays to achieving plan objectives, implementing well characterised, high cost/effort corrective actions.

High	High risk of failure to achieve the plan's objectives. Results in medium-long term delays to achieving plan objectives, implementing uncertain, high cost/effort corrective actions.
Major	The plan's objectives are unlikely to be achieved, with significant legislative, technical, ecological and/or administrative barriers to attainment that have no evidenced mitigation strategies.
Critical	The plan's objectives are unable to be achieved, with no evidenced mitigation strategies.