

Friday, 10 February 2023



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Department of Water and Environmental Regulation
Prime House
8 Davidson Terrace
Joondalup WA 6027

ATTENTION: Nelia Maritz / Meenu Vitarana CPS 9879/1 -
Bussell Highway RR Clearing Permit Application

SUBJECT: CPS 9879/1 - KARRIDALE WEST ROAD RESERVE – REVEGETATION MANAGEMENT PLAN

This Revegetation Management Plan (RMP) has been prepared to support application for CPS 9879/1. See Figure 1 for CPS 9879/1 application area. The RMP reiterates key matters and updates some aspects of information previously provided in responses dated 27 January, 5 January and 6 December to the Department's requests for further information.

Revegetation Area Extent Confirmation

With reference to Figure 2, we confirm that previous information in response dated 27 January 2023 (document A22.004-LTR-CPSPD_03_FINAL) showing extent of revegetation area outside of Lot 411 (Lots as shown drawing 924-03-001 in Appendix 1) was erroneous. The proposed revegetation area is wholly contained within Lot 411. An updated version of Figure 2 is provided.

The proposed revegetation area is 1 ha in size, approximating 60 m wide by 170 m long and is shown in Figure 2. The proposed revegetation area improves connections for existing vegetated areas located to the north and south that will be retained within:

- the Bushby Road reserve; and
- vegetated Lots to the north
- vegetated road reserve to the north.

The area of proposed revegetation is greater than three times the proposed impact area. Revegetation will primarily target replacement of habitat for both Black Cockatoo species and Western Ringtail Possum. A corridor width of 40 m is generally recognised as being sufficient to support fauna movement and being sufficient to sustainably withstand edge effects. The proposed revegetation is 60 m wide, exceeding this recognised corridor width.

Revegetation Area Conservation Covenant

The proposed revegetation will be formally protected in perpetuity under a Conservation Covenant agreement. This agreement will be implemented as a condition of the clearing permit approval and will be implemented alongside issuing of new lot titles as part of the subdivision.

Revegetation Plan Approach

Revegetation will predominately comprise Peppermint (*Agonis flexuosa*) Marri (*Corymbia calophylla*). This reflects the vegetation types within the project area, the vegetation that is proposed to be impacted, and the ability for both species to provide key habitat for both Western Ringtail Possums and Black Cockatoo species.

Peppermint to Marri planting will be done on a ratio of 3:1 reflecting the ratios observed in existing vegetation within the project area. Proposed planting density will be such that establishment of Peppermint and Marri trees will be at approximate 5 m intervals. This is proposed to provide sufficient growing room for each tree, with a target outcome of an interconnected canopy of mature trees. This equates to approximately 400 trees established. In order to achieve this target an allowance of 100% additional initial tubestock planting has been allowed to account for normal failure rate of non-irrigated tubestock plantings. This equates to planting of 800 trees.

Other locally endemic mid storey and ground cover species will also be planted to enhance habitat diversity and offer opportunities for a wider range of common species. Given the degraded nature of the impacted vegetation, the intent of the revegetation is not to establish a vegetation community that resembles a local intact vegetation community, but rather an area of native vegetation that supports local wildlife and is self-sustaining.

Completion Criteria

Completion criteria have been prepared considering the key aim of providing habitat for both Western Ringtail Possums and Black Cockatoo species and in the context of the degraded nature of the vegetation being impacted, for which this mitigation planting is being undertaken. The proposed establishment and monitoring and maintenance period is for 3 years following initial planting.

Completion criteria include species density and cover, weed impacts and grazing impacts. The vegetation will be monitored across the proposed 3-year establishment period with the trajectory of establishment assessed to determine compliance with target criteria up to the final monitoring event. The target criteria and the proposed monitoring methodology are described below in Table 1.

Table 1 Completion Criteria

Criteria	Target	Monitoring Methodology
Key species abundance	Establishment of 300 Peppermint and 100 Marri trees across the 1 ha site. Density of 1 tree per 25m ²	Establishment of three monitoring transects. Transects to be 5m width by 50m length (following planting rows). Abundance of key species scored. Average of 10 trees per transect required to meet target.
Overall plant abundance and cover	Establishment of 60% of tubestock from initial planting density rate. Native species cover of 20% by end of year 3.	Monitoring of three 5m x 20m sub quadrats anywhere within the three 5m x 50m monitoring transects. Abundance of all planted species scored and % native foliar cover estimated. Trajectory of foliar cover increase assessed year by year to determine trend.
Weed cover	Weed species and cover do not appear to be significantly limiting the establishment of native vegetation	Observation of weeds present and impact by experienced revegetation specialist across the three monitoring transects
Grazing	Grazing (by rabbits or kangaroos) is impacting <25% of vegetation present and does not appear to be significantly limiting the establishment of native vegetation	Observation of grazing evidence and impact by experienced revegetation specialist across the three monitoring transects

Monitoring is proposed to be undertaken annually for the 3-year monitoring and maintenance period. This is discussed in detail in following sections.

Species Selection and Quantity

Species selected for revegetation are local endemics which are commercially available as tubestock, and which offer habitat value to local fauna species. The species selected also align with those of the Landscape Implementation Plan prepared for the Local Development Plan (See Appendix A) which is approved by the Local Government. If required shrub and groundcover species may be substituted for suitable alternatives. Tree species must be implemented as specified due to identified fauna habitat values of the particular species.



Table 2 Revegetation Species List

Species	Stratum	Quantity (for 1 ha)	Comment
<i>Agonis flexuosa</i>	Tree	600	Key forage- Western Ringtail Possum
<i>Corymbia calophylla</i>	Tree	200	Key forage- Black Cockatoos
<i>Acacia extensa</i>	Shrub	40	
<i>Acacia myrtifolia</i>	Shrub	40	
<i>Calothamnus quadrifidus</i>	Shrub	40	
<i>Melaleuca incana</i>	Shrub	40	Forage-western ringtail possum
<i>Taxandria juniperina</i>	Shrub	40	Forage-western ringtail possum
<i>Taxandria parviceps</i>	Shrub	40	Forage-western ringtail possum
<i>Meeboldina scariosa</i>	Groundcover	160	
<i>Ficinia nodosa</i>	Groundcover	160	
Total		1360	



Table 3 Implementation Plan

Revegetation Activity	Item	Specification	Volume	Schedule	Responsibility
Site Prep	Install fencing	Install suitable fencing to limit access by stock, rabbits and kangaroo. Steel picket and straight wire with rabbit mesh or small ringlock with folded toe at base to reduce burrowing.	Approx. 500m with minimum two access gates (one north one south)	Prior to planting of tubestock.	Fencing contractor
		Limiting site access will also reduce the risk of spreading weeds during construction or through future residents entering the Site.		May be undertaken post ripping and herbicide application	
		Long term fencing consistent with Conservation Covenant requirements.			
Site Prep	Rip planting lines	Due to loam-clay soils, stock compaction of soils and existing thatch of pasture grass rip planting lines to depth of at least 10cm. Rip with multi tined attachment. Use of combination ripping and mounding plough or furrow scraping attachment recommended.	One ha area. Planting undertaken in 5 m wide corridors	3-6 weeks following initial knock down herbicide application	Landscape contractor
Weed Control	Weed control pre planting	Knockdown spray with Glyphosate across planting area pre ripping works. Recommend via boom spray unit. Two events may be required several weeks apart to achieve effective knockdown.	1 ha boom spray glyphosate- allow 3x events	Initial events autumn. Final event early winter.	Licensed weed contractor
	Ongoing spot spraying	3-4 weeks post ripping undertake final knockdown spray with Glyphosate.			
		Spot spray Glyphosate around planting rows. Recommend Quik Spray reel system or similar. Allow for two events annually. Aim of weed control is to support establishment of tubestock, not targeting removal or high level of suppression of weed loads. Hand weeding around tubestock may be considered as an alternative technique. Spot spraying is proposed to be undertaken for up to 5 years to support establishment.	Allow for two events of 1ha spot spray	Winter and spring events	Licensed weed contractor
Revegetation	Initial planting	Allow minimum two weeks following final herbicide application event pre planting. Tube-stock planting via Pottiputki, small augur or similar. Species list and quantities as specified in Table 2 above.	1360 tubestock plus planting labour	Winter following rainfall (at least 2 weeks following last herbicide application).	Landscape contractor
	Infill planting	Infill planting effort with allowance for 1/3 of original planting rate as required	453 tubestock plus planting labour	1 year after initial planting Late winter/spring	Landscape contractor

Contingency Measures

Table 4 describes potential contingency actions to correct or mitigate issues arising that appear to be preventing revegetation from trending towards achieving completion criteria or for unexpected destructive events.

Table 4 Contingency Measures

Completion Criteria	Potential Issue	Corrective Actions
Plant abundance and cover	Plant abundance and cover below completion criteria by year 3 or monitoring and opinion of revegetation expert that vegetation not trending towards meeting criteria	Undertake infill planting with 1/3 original rate allowance. Further infill may be required if criteria continue to not be met.
Key species abundance	Abundance of key species Marri and Peppermint trees. below completion criteria by year 3 or monitoring and opinion of revegetation expert that vegetation not trending towards meeting criteria	Undertake infill planting with 1/3 original rate allowance. Further infill may be required if criteria continue to not be met.
Weeds	Weed abundance identified as significantly limiting establishment of revegetation	Increase frequency of weed control events. Use monitoring to inform required frequency.
Grazing	Monitoring indicates that grazing is impacting on >25% of tubestock, or grazing is identified as a significant factor limiting revegetation success	Inspect and repair fencing. Increase frequency of fencing inspections. Undertake program of rabbit bating if issue. Consider increasing height of fencing if Kangaroos are issue.
Whole project	Catastrophic event such as site wide bushfire or flooding for extended period	Undertake post impact monitoring and identify corrective actions plan. Repeat works following this RMP may be required if progress to date has been destroyed.



Monitoring Plan

Monitoring is proposed to be undertaken annually for the 3-year monitoring and maintenance period. Monitoring will be undertaken by an experienced revegetation specialist and will follow methodology as described in Table 5 below. Monitoring reports will be provided to DWER as required under clearing permit reporting conditions. Monitoring reports will provide a summary of works undertaken during monitoring period and results of assessment. Report will also provide an assessment of trajectory or compliance with completion criteria and will provide management recommendations or corrective actions to be implemented as required.

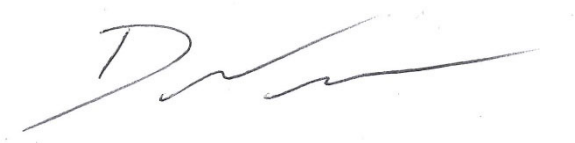
Monitoring is proposed to be undertaken in spring during peak weed growth period and allowing time for planning of infill planting in following winter if required.

Table 5 Monitoring Plan

Completion Criteria	Target	Monitoring Methodology
Overall site condition	Not specified	Establish photo monitoring points at 6 locations, being each end of three 50m monitoring transects. Comments from experienced revegetation specialist on revegetation status.
Key species abundance	Establishment of 300 Peppermint and 100 Marri trees across the 1 ha site. Density of 1 tree per 25m ²	Establishment of three monitoring transects. Transects to be 5m width by 50m length (following planting rows). Abundance of key species scored. Average of 10 trees per transect required to meet target.
Overall plant abundance and cover	Establishment of 60% of tubestock from initial planting density rate.	Monitoring of three 5m x 20m sub quadrats anywhere within the three 5m x 50m monitoring transects. Abundance of all planted species scored and % native foliar cover estimated.
	Native species cover of 20% by end of year 3.	Trajectory of foliar cover increase assessed year by year to determine trend.
Weed cover	Weed species and cover do not appear to be significantly limiting the establishment of native vegetation	Observation of weeds present and impact by experienced revegetation specialist across the three monitoring transects
Grazing	Grazing (by rabbits or kangaroos) is impacting <25% of vegetation present and does not appear to be significantly limiting the establishment of native vegetation	Observation of grazing evidence and impact by experienced revegetation specialist across the three monitoring transects



Yours sincerely,
Western Environmental Approvals Pty Ltd

A handwritten signature in dark ink, appearing to read 'Dale Newsome', with a long horizontal stroke extending to the right.

DALE NEWSOME
Director and Senior Principal





Figure 1: Vegetation Impact

0

7

14

21

28 m

N

SCALE

1:1,000

SHEET SIZE

A3 COLOUR

COORDINATE REFERENCE SYSTEM

GDA2020 / MGA zone 50

DATA SOURCE

LANDGATE AERIAL IMAGERY 08/2021

PROJECT/REPORT NAME

Biological Survey
West Karridale Roadside

CLIENT

Blokk Property Australia

PROJECT NUMBER

A22.004

VERSION

0

DRAWN BY / REVIEWED BY

AC / JB

DATE

24/1/2023

Legend

Clearing Permit Area

Native vegetation clearing

CadastreAddressLGATE_002

Vegetation Types

Marri over weedy grassland

Peppermint over weedy grassland

Non native

No	Description	Drawn	Approved	Date
A	Original issue	AC	JB	24/1/2023

NOTES:
Cadastre boundary (LGATE-002)

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Figure 2: Revegetation Area

010203040m

N

SCALE
1:1,500

SHEET SIZE
A3 COLOUR

COORDINATE REFERENCE SYSTEM
GDA2020 / MGA zone 50

DATA SOURCE
LANDGATE AERIAL IMAGERY 08/2021

PROJECT/REPORT NAME
Biological Survey
West Karridale Roadside

CLIENT
Blokk Property Australia

PROJECT NUMBER
A22.004

VERSION
0

DRAWN BY / REVIEWED BY
AC / JB

DATE
10/2/2023

Legend

Clearing Permit Area

Revegetation Area

Native vegetation clearing

No	Description	Drawn	Approved	Date
A	Original issue	AC	JB	10/2/2023

NOTES:
Cadastral boundary (LGATE-002)

WESTERN
ENVIRONMENTAL

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SCHEDULE Statement of Limitation

Statement of Limitations

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