



MRC GRAPHITE PTY LTD



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MUNGLINUP GRAPHITE PROJECT FLORA & VEGETATION MANAGEMENT PLAN



Prepared by Integrate Sustainability

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This document has been prepared based on assumptions as reported throughout and upon information and data supplied by others or generated by ISPL. This document has been subject to review and changes from the Client and the Client's representative.

Corporate Endorsement

I hereby certify that to the best of my knowledge, the information contained within this Environmental Management Plan is true and correct and addresses all the requirements of the Instructions on how to Prepare *Environmental Protection Act 1986* Part IV Environmental Management Plans.

Name: Mark Caruso

Signed: 

Position: Chief Executive Officer

Date: 4/03/2021

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Summary

The purpose of the Munglinup Flora & Vegetation Management Plan (FVMP) is to support environmental referrals under the *Environmental Protection Act 1986* and *Biodiversity and Conservation Act 1999* for the Munglinup Graphite Project (the Project) proposed by MRC Graphite Pty Ltd. Table 1 presents a summary of this Management Plan including the completion criteria which is specific to the proposal and against which the environmental objectives are measured.

Table 1 Summary of the Flora and Vegetation Management Plan

Item	Description
Title of Proposal	Munglinup Graphite Project.
Proponent Name	MRC Graphite Pty Ltd.
Ministerial Statement Number	Not Applicable at this point
Purpose of the Management Plan	<p>This management plan is submitted in support of and environmental assessment under the <i>Environmental Protection Act 1986</i> and <i>Environmental Protection and Biodiversity Conservation Act 1999</i></p> <p>The purpose of this plan is protect and manage the following Significant Flora located within or adjacent to the Munglinup Graphite Project:</p> <ul style="list-style-type: none"> • <i>Conostylis lepidospermoides</i> - Sedge Conostylis (T) • <i>Lepidosperma</i> sp. Mt. Chester (S. Kern et al. LCH 16596)(P1) • <i>Leucopogon</i> sp. Cascades (M. Hislop 6393)(P1) • <i>Commersonia rotundifolia</i> (P3) • <i>Pultenaea calycina</i> subsp. <i>Proxena</i> (P4) • <i>Stachystemon vinosus</i> (P4) • <i>Leucopogon</i> aff. <i>canaliculatus</i> (potential new taxa) • <i>Synaphea</i> aff. <i>drummondii</i> (potential new taxa) • <i>Synaphea</i> sp. Jilakin Flat Rocks Rd (R. Butcher et. al RB200) (potential new taxa). <p>And to protect and manage the following local and regionally Significant Vegetation Units and Communities:</p> <ul style="list-style-type: none"> • Proteaceae Dominated Kwongkan Shrubland TEC (VU 16 & 17) • VU 5 – LMesppMH • VU 7 – LWEdGpHp • VU 11 – TSMuAs • VU 15 – LWEspMpBi
Key Environmental Factors	Flora and Vegetation
Objectives	<i>To protect flora and vegetation so that biological diversity and ecological integrity are maintained.</i>
Condition Clauses	Not Applicable.
Key Provisions of the plan	<p>Proposed management are in line with the EP Act and EPBC Act, to ensure biological diversity and ecological integrity are maintained. The key proposed provisions are:</p> <ul style="list-style-type: none"> • Implement an internal clearing permit procedure to avoid unauthorised clearing. • Where possible avoid or minimise disturbance to conservation significant flora, novel species and vegetation communities. • Develop and implement hygiene management procedures to prevent the introduction and spread of weed species within the project area. • Undertake field searches during operations to locate additional populations of conservation significant species located solely within the development envelope. • Undertake field searches during operations to locate additional occurrences of locally and regionally significant vegetation units or similar vegetation units.

	<ul style="list-style-type: none">• Undertake rehabilitation activities that encourage the re-establishment of significant and restricted species and community.• Undertake audits and inspections to ensure flora and vegetation management practices are being implemented.• Implement controls and monitoring to limit indirect impacts from dust, changes in surface follows and sediment release on uncleared vegetation.• Undertake ongoing staff training and awareness on the conservation significant flora and vegetation communities present at the project and these associated management actions. <p>Note that dieback management is covered in a separate management plan.</p>
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1. Context, Scope and Rationale

This Environmental Management Plan (EMP) for Flora and Vegetation has been prepared to support environmental assessment under the *Environmental Protection Act 1986* and *Biodiversity and Conservation Act 1999* for the Munglinup Graphite Project (the Project) proposed by MRC Graphite Pty Ltd a wholly owned subsidiary of Mineral Commodities Limited (MRC).

This EMP has been prepared in accordance with the requirement of the *Instructions on how to prepare Environmental Protection Act 1986 Part IV Environmental Management Plans* (EPA, 2020)

1.1. Proposal

The Munglinup Graphite Project (the Project) is a joint venture between MRC Graphite Pty Ltd (MRCG), the operator, and Gold Terrace Pty. Ltd. The project is located 105km west of Esperance, 85km east of Ravensthorpe and 4km north of the town of Munglinup in the south coast region of Western Australia (Figure 1). Access to the Project is currently from the South Coast Highway and the local Mills and Reynolds Roads.

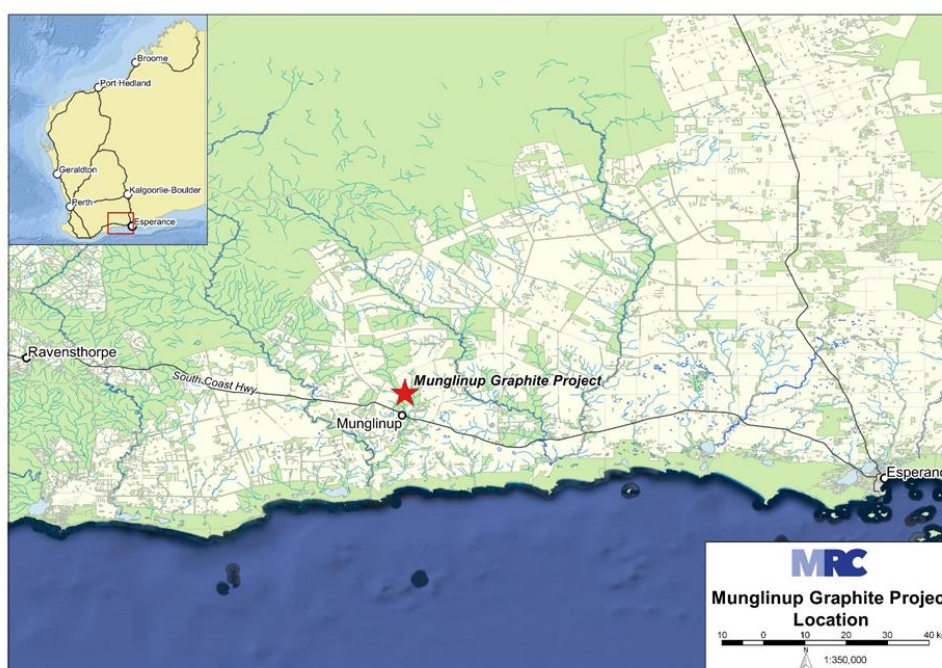


Figure 1 Project Location

The project is predominantly situated within Mining Reserve R24714 on M74/245, G74/9, L74/55 and L74/56. Graphite within the Project area has been identified, studied and historically mined by several companies over the last 100 years. The Munglinup Graphite Project has a proposed maximum disturbance footprint of 350ha within a development envelope that cover 650ha. Past clearing onsite has been limited to historic shafts and exploration pads and drill lines, the majority of 350ha will be new disturbance.

The graphite deposits are proposed to be mined via open cut methods with multiple open cut pits mined concurrently over an estimated 10-15-year mine life. The locations of the proposed open pits are shown in Figure 2 (purple area) along with associated infrastructure (light blue area). Approximately 3.5 million tonnes of material (ore and waste) will be mined per annum, the project has a strip ratio of 5:1. Table 2 provides a breakdown of the disturbance associated with each proposed activity.

Table 2 Maximum Disturbance Footprint

Element	Footprint (ha)
Open Pits	63
Waste Rock Landform	120
Tailings Storage Facility	86
Supporting Infrastructure	11
Haul/LV Roads	40
Topsoil & Vegetation Stockpiles	30
Total Disturbance	350

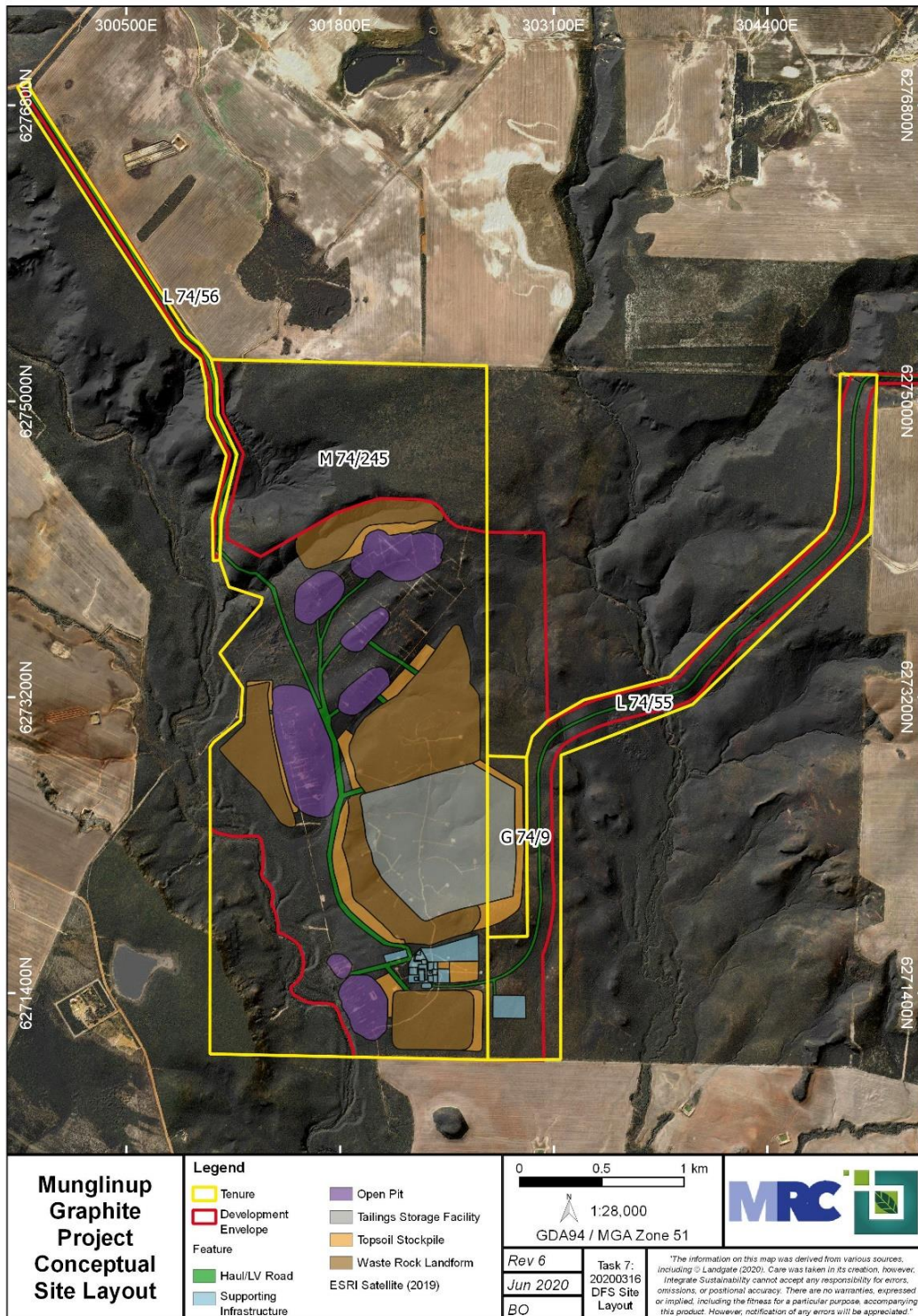


Figure 2 Project Development Envelope and Conceptual Site Layout

The open pits are anticipated to be mined by free dig however, some drill and blast activities may be required. Ore from each of the open pits will be transported to a run-of-mine (ROM) pad located to the south-east on M74/245. Ore will then be processed through an onsite processing facility. The pits are estimated to range in depth from 32m to 120m below ground level. The open pits will extend below ambient groundwater levels (2.4 to 8m below ground level) (Rockwater, 2020).

On-site stockpiling and processing will produce graphite via a crushing, grinding and flotation circuit operating on a 24/7 operation basis. The plant has a proposed annual throughput of up to 500kt per annum of ore, producing a peak of 80-85kt of graphite per year with disposal of up to 350kt of tailings per annum in a lined facility.

MRCG proposes to place the processing waste in a single tailings storage facility (TSF) located in the south-east of M74/245 and partially on G74/9 between two ridges where the natural topography dips in a south-west direction. The TSF will utilise the two ridges to reduce total embankment fill requirements (KCB, 2018). The western perimeter of the proposed TSF site is approximately 500m from the Munglinup River. Tailings material from the rougher and cleaner flotation circuits will report to a tailings thickener before being pumped to the TSF.

The Project has an estimated water demand of 0.5GL/annum or on average up to 16.5L/second which will be used for dust suppression and processing. Preliminary results suggest that 50-75% of the water will be sourced from dewatering the pits and TSF decant water with the remainder coming from production bores (MRC Graphite Pty Ltd, 2018).

1.2. Scope and Objectives

This *Flora and Vegetation Management Plan (FVMP)* applies to potential direct and indirect impacts of the implementation of the Munglinup Graphite Project on terrestrial flora and vegetation communities in and near the project area. The objectives of the plan are to:

- Identify the key project aspects that have the potential to directly or indirectly impact terrestrial flora or vegetation.
- Describe what will be done to avoid or minimise adverse impacts on flora and vegetation communities.
- Describe the environmental outcomes that will adequately protect flora and vegetation, consistent with the EPA policies and environmental objectives.
- Define how evidence will be collected to enable assessment of compliance with the criteria.

This FVMP applies to all phases of the project, including construction, operation, closure and rehabilitation.

This FVMP addresses the objectives of the 2014 Australian Government Department of the Environment, Threat abatement plan for disease in natural ecosystems caused by *Phytophthora cinnamomi*.

1.3. Key Environmental Factors

This FVMP specifically addresses the EPA Environmental Factor of *Flora and Vegetation*. The EPA defines the factor of *Flora and Vegetation* as follows:

Flora is defined as native vascular plants. Vegetation is defined as grouping of different flora patterned across the landscape that occur in response to environmental conditions.

The EPA's view is that vegetation can be an effective surrogate for ecological processes and the diversity of interactions in terrestrial ecosystems. The main environmental objective for this factor then is to protect flora and vegetation so that biological diversity and ecological integrity are maintained.

1.3.1. Proposed Activities

Key activities that have the potential to affect the local flora and vegetation include those associated with all phases of the Project, including exploration/ resource definition, construction, operation, rehabilitation and closure of the Project. These have been detailed in Table 3 below, and each phase may include several of the aspects described, and may include both direct and indirect impacts.

These activities and their associated impacts to fauna (in particular, species of conservation significance) have been considered extensively in the Environmental Impact Assessment undertaken by Woodman Environmental (Woodman Environmental, 2020(b)).

Table 3 Proposed Activities of the Project which could impact Flora and Vegetation Communities

Impacts / Activities	Potential Outcome
Clearing	Mining, exploration and survey may result in unintentional clearing of individual plants or populations during clearing and off-road activities.
Weed invasion	Mining activities may increase the risk of weed invasion and spread through clearing, construction of new roads and tracks, increase vehicle usage and poor hygiene procedures.
Introduction of dieback	Mining and exploration activities can increase the chance of introduction or spread of dieback into new areas through clearing, construction of new roads and tracks, increased vehicle usage and lack of, or poor hygiene procedures.
Changed fire regimes	Mining activities can cause accidental or unplanned fires as a result of road accidents or arson. Mining activities can also prevent 'natural' fires due to increased safety measures and awareness.
Surface water flows	Mining activities can involve construction and a number of ground disturbing activities. If not correctly managed these activities and changes to the landscape have the potential to impact on the natural surface water flows of an area potentially impacting on vegetation and flora which are dependent on these flows.
Habitat fragmentation	Fragmentation of individuals and populations as a result of land clearing reduces potential for gene flow and populations to persist. Fragmentation has the potential to exacerbate other threats such as fire and weed spread. It can also result in allowing herbivores into previously dense or inaccessible areas.
Dust suppression	Use of hypersaline water in dust suppression on roads and other surfaces has the potential to impact flora and vegetation if it isn't contained and prevented from flowing to surrounding vegetation.
Spillages	Spillages of tailings or hypersaline water from pipelines can result in large scale vegetation death if the correct controls are not in place.

1.3.2. Site-specific Environmental Values

1.3.2.1. Conservation Significant Flora

Twelve significant flora taxa were identified as requiring specific management when the project is implemented. These including one Threatened taxon, seven Priority flora taxa, and four taxa considered to be significant for other reasons (because they either potentially represent undescribed taxa, are known from very few records, or are outliers of the main range of the taxon). Nine warrant further management due to occurrence or proximity to the Development Envelope, these being:

- *Conostylis lepidospermoides* (Threatened).
- *Lepidosperma* sp. Mt Chester (S. Kern et al. LCH 16596) (P1).
- *Leucopogon* sp. Cascades (M. Hislop (3693) (P1).
- *Commersonia rotundifolia* (P3).
- *Pultenaea calycina* subsp. *proxena* (P4).
- *Stachystemon vinosus* (P4).
- *Leucopogon* aff. *canaliculatus* (potential new taxon).
- *Synaphea* aff. *Drummondii* (potential new taxon) and

- *Synaphea* sp. Jilakin Flat Rocks Rd (R. Butcher et. al RB200) (potential new taxon).

Full descriptions of the flora are provided in the Woodman Environmental (2020) report, however a brief description of each is below. Locations of significant flora taxa are presented in Figure 6, Figure 7 and Figure 8.

***Conostylis lepidospermoides* (T)** - a rhizomatous, tufted perennial herb growing up to approximately 0.4 m high, occurs on undulating plains on grey or yellow-brown sand, sometimes with laterite gravel. This taxon is listed as Vulnerable under the BC Act and Endangered under the EPBC Act. It is known to occur over a range of approximately 240 km in Western Australia (where it is endemic), from near Frank Hann National Park in the north-west and Ravensthorpe in the west to near Cape Le Grand National Park in the east. It was recorded at three locations in the Study Area with a total of 65 individuals recorded representing two populations in an area mapped as VU 16. It is possible there are further individuals in the Study Area; however, field observations indicate they will likely only occur in the vicinity of recorded locations (Woodman Environmental, 2020).



Figure 3 *Conostylis lepidospermoides*

***Lepidosperma* sp. Mt Chester (S. Kern et al. LCH 16596) (P1)** - a tufted sedge growing to 0.35 m high, this taxon is not listed under the EPBC Act or BC Act, however, is classified as P1 by the DBCA. This taxon is known to occur over a range of approximately 50 km in Western Australia (where it is endemic), from north of Fitzgerald River National Park in the west to north of Jerdacuttup in the east. The collection of this taxon represents a range extension of approximately 45 km to the east; however, *Lepidosperma* taxa are poorly collected, and therefore this range extension is not considered to be particularly significant. It was recorded at two locations in the Study Area with a total of 35 individuals recorded, representing two populations in areas mapped as VUs 1 and 2. The habitat it was found in is relatively widespread in the Study Area, and is known to occur in the Development Envelope based on field observations; as such, it may occur within it, as well as at further locations in the Study Area (Woodman Environmental, 2019).

***Leucopogon* sp. Cascades (M. Hislop 3693) (P1)** - a shrubby flowering plant, it belongs to a taxonomically difficult group of *Leucopogon* (see (Woodman Environmental, 2019) only known from near and in Fitzgerald River National Park; giving this taxon a total range of approximately 26 km. The Study Area is the western-most known extent of the species. It has recently been classified by DBCA as P1 following its formal listing on the census and was recorded at two-point locations representing two populations. No counts of individuals were made, but it was noted as being uncommon at both locations. The locations are both in areas mapped as VU 16. The habitat it was found in is relatively widespread in the Study Area, and is known to occur in the Development Envelope based on field

observations; as such, it may occur within it, as well as at further locations in the Study Area (Woodman Environmental, 2020).

***Commersonia rotundifolia* (P3)** - a straggly, semi-prostrate to erect shrub to 1.5 m high, this taxon is not listed under the EPBC Act or BC Act, however, it is classified as P3 by the DBCA. This taxon is endemic to the south coast of Western Australia and has a known range in Western Australia of approximately 310 km, from near Ongerup in the west to north-west of Esperance in the east and the protologue of this taxon indicates it is observable only in recently burnt areas, indicating it is short-lived. It was recorded at a single point location in the Study Area with a total of five live individuals recorded; of interest, however, was the presence of numerous recently dead individuals at this location. It is possible that this taxon is common and occurs widely in the Study Area post-fire, including within the Development Envelope, as VU 14 was mapped widely in the Study Area (Woodman Environmental, 2019).



Figure 4 *Commersonia rotundifolia*

***Pultenaea calycina* subsp. *proxena* (P4)** - a many-branched, compact shrub growing to approximately 1 m high, this taxon is not listed under the EPBC Act or BC Act, however, is classified as P4 by the DBCA. It has a known range in Western Australia of approximately 75 km (where it is endemic), from south-west of Ravensthorpe in the west to the Study Area in the east. It was recorded at 24 point locations, with a total of 287 individuals representing two populations. These locations were in the northern half of the Study Area, primarily in areas mapped as VU 15 and adjacent areas of VU 1 and one population extended into an area mapped as VU 9. in the Development Envelope, 6 locations and 60 individuals were recorded; it is considered likely that further locations of this taxon are present within the Development Envelope (Woodman Environmental, 2019).



Figure 5 *Pultenaea calycina* subsp. *proxena*

***Leucopogon* aff. *canaliculatus* (potential new taxon)** – a collection from the Study Area was initially identified by *Leucopogon* expert Mike Hislop from the WA Herbarium as *Leucopogon* aff. *diversifolius* (Woodman Environmental, 2019); however, after submission of further material collected during the primary field survey, the material was identified as *Leucopogon* aff. *canaliculatus* (Woodman Environmental, 2020). The collection of material from the Study Area extends the range of this taxon (including anomalous material) west by a further 25 km.

Further review of this taxon, as well as others in this subgroup, is required to resolve the taxonomy of a number of anomalous collections; however, until this review is complete, it is regarded as a taxon of significance as a precaution, as per EPA guidance, given that it is anomalous for *Leucopogon canaliculatus*, and represents the western-most known collection of this species.

Leucopogon aff. *canaliculatus* was recorded at 185 locations within the Study Area; with a total of 2,009 individuals recorded across these locations and the majority of locations and individuals (171 locations and 1,885 individuals) recorded within the Development Envelope. This taxon establishes in large numbers following fire and appears to decline significantly in numbers with time since fire.

There are also large areas of suitable habitat in the Study Area outside the Development Envelope that were not searched. It is therefore considered likely that there are reasonable numbers of individuals present elsewhere in the Study Area. Additionally, the numbers of individuals recorded in the largest population in the Study Area, which is almost entirely contained in the Development Envelope, are much higher than other populations because this population has been relatively recently burnt, as outlined above (Woodman Environmental, 2020).

***Synaphea* aff. *Drummondii* (potential new taxon)** -a collection from the Study Area was identified by *Synaphea* expert Ryonen Butcher from the WA Herbarium (listed as P3); however, typical *Synaphea drummondii* is generally accepted to occur in the central wheatbelt of W.A. The collection from the Study Area appears to match one such collection made from 4 km south both possibly representing an undescribed taxon. These are the eastern-most collections of material resembling *Synaphea drummondii* and it is considered appropriate to treat the taxon from the Study Area as significant as per EPA guidance (Woodman Environmental, 2019).

It was recorded at four locations scattered across the Study Area in areas mapped as VU 16; no counts of individuals were made, but it was noted as being uncommon at all locations. Three of the four locations were in recently disturbed areas, including recently burnt and recently chained vegetation, and it was noted as being more common in these locations than at the single undisturbed location. However, one of the recorded locations is in the Development Envelope; the habitat it was found in is relatively widespread, and there may be further occurrences in the Development Envelope and wider Study Area.

Synaphea sp. Jilakin Flat Rocks Rd (R. Butcher et. al RB200) (potential new taxon) - a collection from the Study Area was identified by *Synaphea* expert Ryonen Butcher from the WA Herbarium as *Synaphea* sp. as it does not fit well within the current taxonomic framework of the genus, and has not been seen before by Ryonen Butcher. As this collection potentially represents an undescribed taxon, it is considered appropriate to treat it as significant as per EPA guidance (Woodman Environmental, 2019).

It was recorded at two locations in the north-east and south-west corners of the Study Area in areas mapped as VU 16; no counts of individuals were made, but it was noted as being uncommon at these locations. These locations were both were in recently disturbed areas, including recently burnt and recently chained vegetation; However, one of the recorded locations is in the Development Envelope; the habitat it was found in is relatively widespread, and there may be further occurrences in the Development Envelope and wider Study Area.

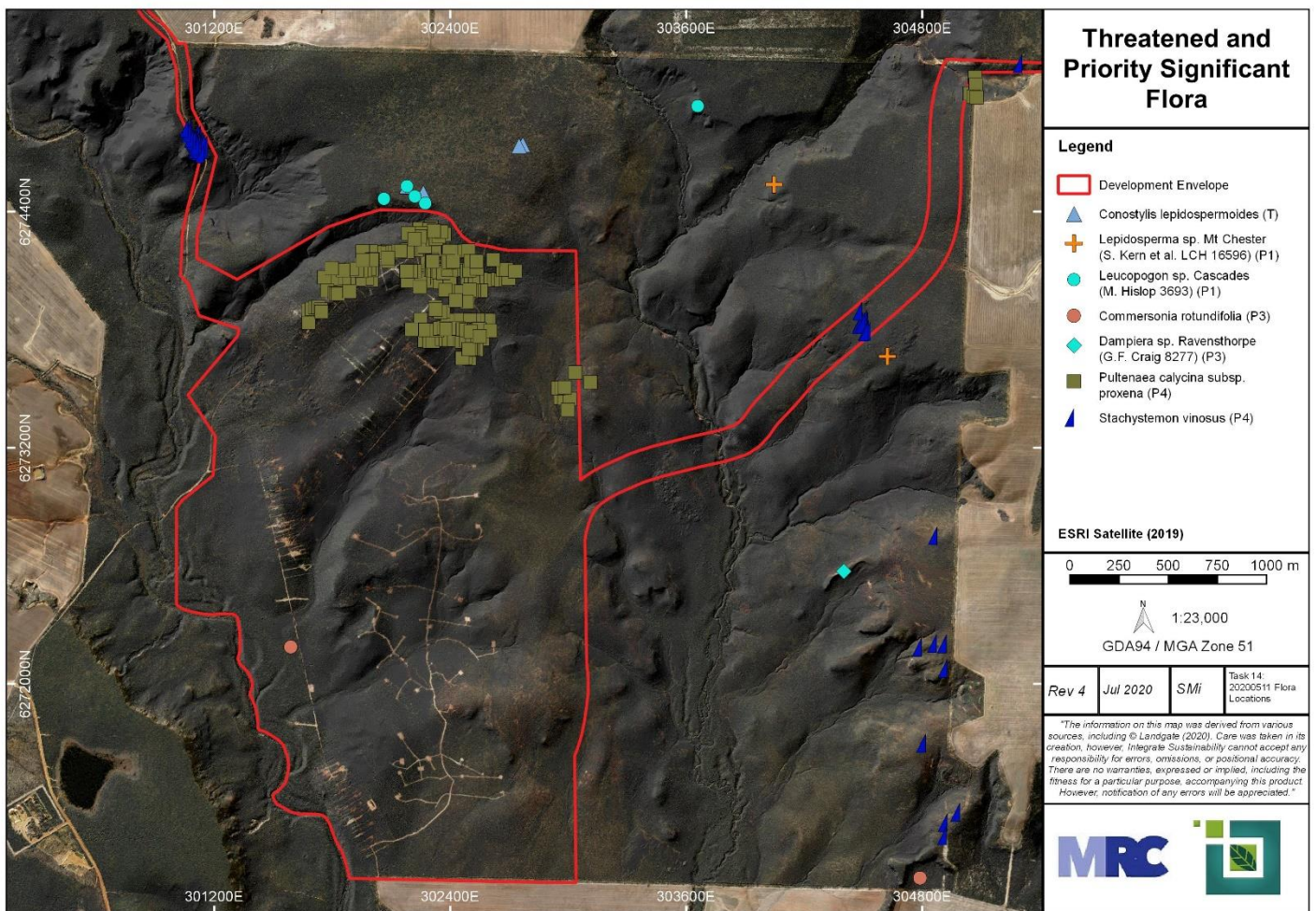


Figure 6 Threatened and Priority Flora Located within to the Development Envelope

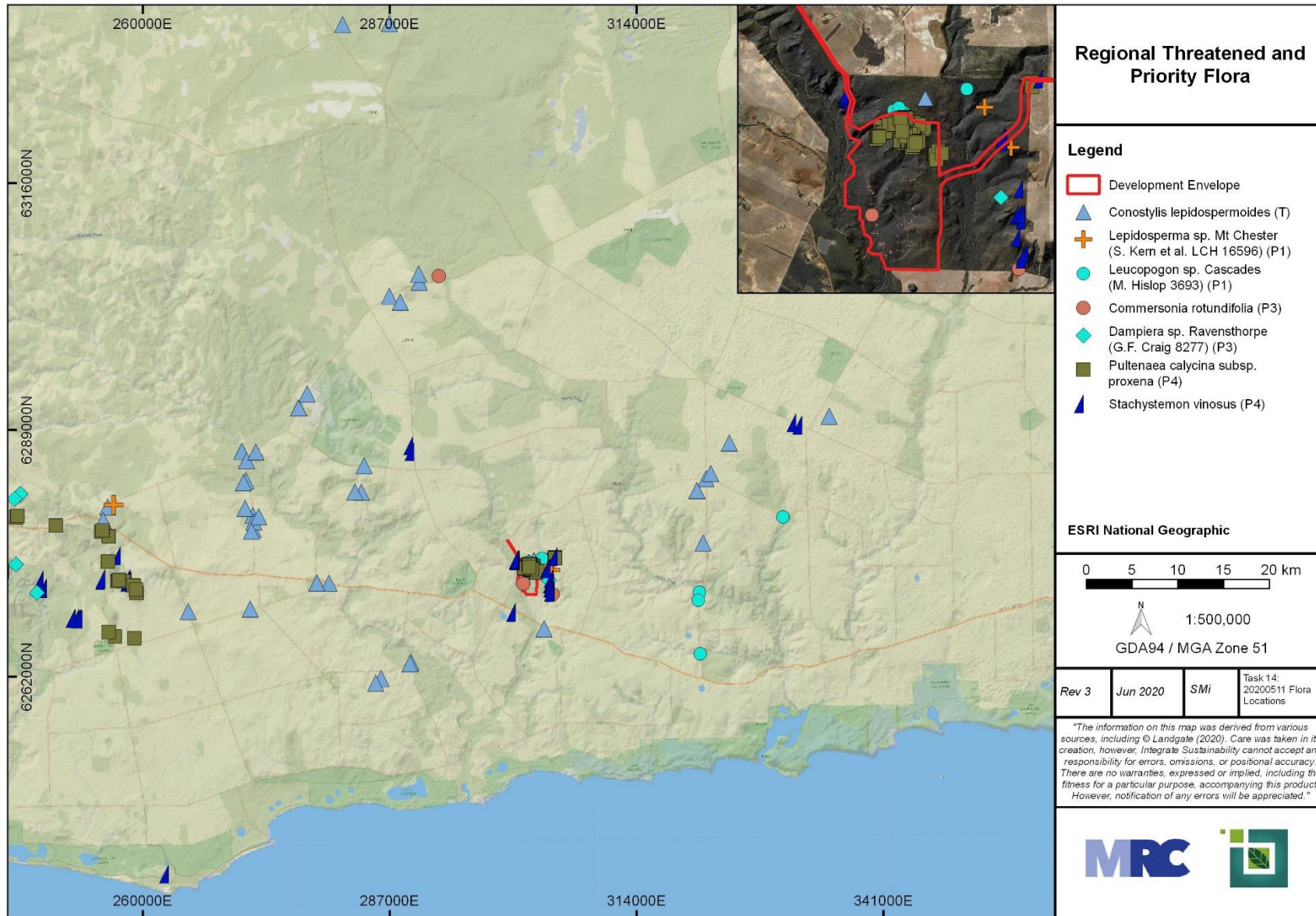


Figure 7 Regional Occurrences of Recorded Threatened and Priority Flora

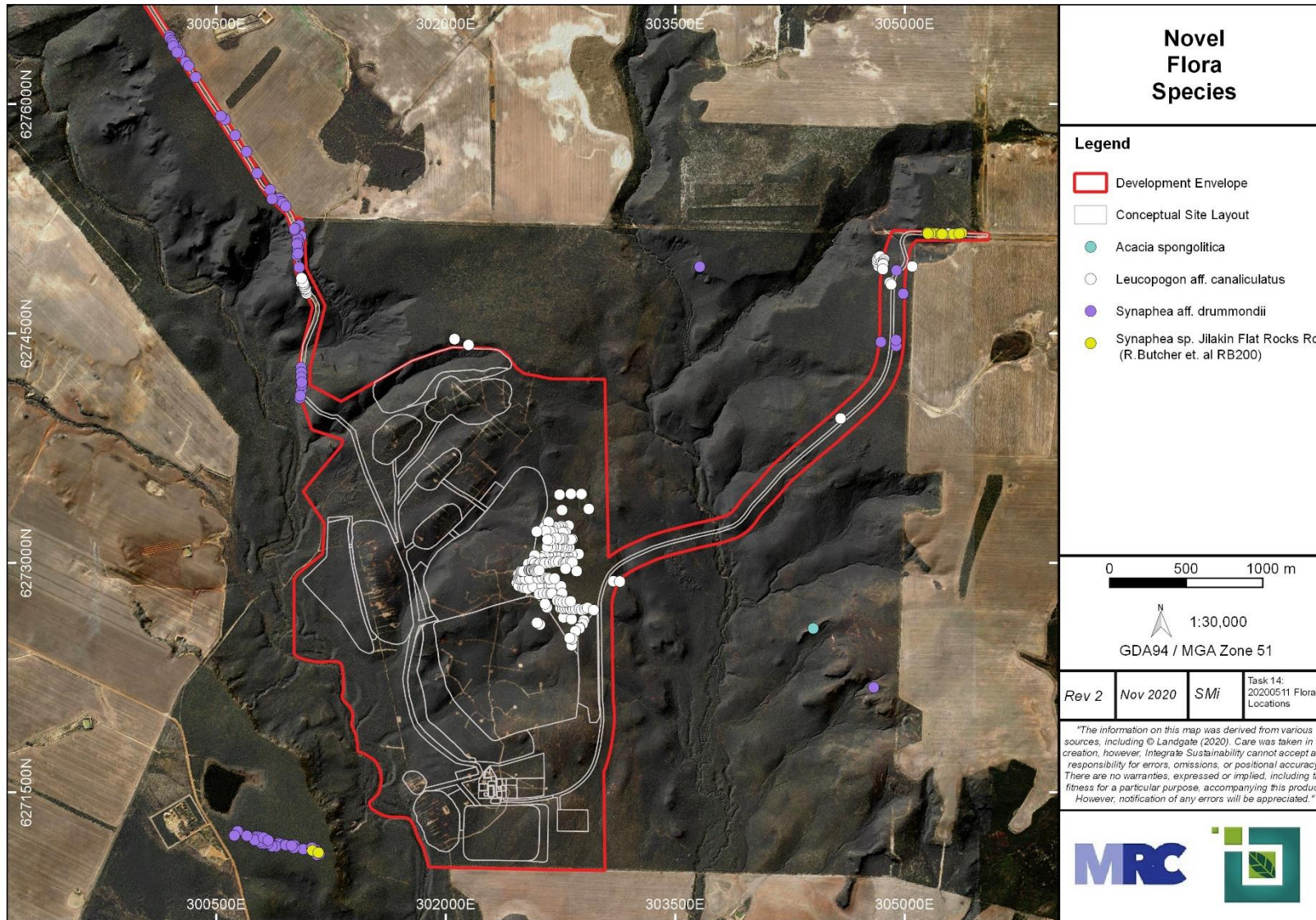


Figure 8 Other Significant Flora located within to the Development Envelope

1.3.2.2. Proteaceae Dominated Kwongkan Shrubland TEC

The 'Proteaceae Dominated Kwongkan Shrublands of the Southeast Coastal Floristic Province of Western Australia' (hereafter referred to as 'Proteaceae Dominated Kwongkan Shrubland') is recognised as being a significant community recorded within the Project study area. The community is listed as an Endangered Threatened Ecological Community (TEC) under the EPBC Act, and is also classified as a Priority 3 Priority Ecological Community (PEC) by DBCA (Woodman Environmental, 2019).

This community is described as being located within the Esperance Sandplains bioregion as well as adjacent parts of the Mallee and Jarrah Forest bioregions of south-west Western Australia. It is described as 'generally Kwongkan shrubland, ranging from sparse to dense, thicket-forming and where Proteaceous species form a significant component' (DoEE, 2014).

In order to represent this TEC, vegetation must satisfy the following criteria as per the *Approved Conservation Advice* for this community (DoEE, 2014):

1. *Occurs within the Southeast Coastal Floristic Province; and*
- 2a. *Characterised by Proteaceae taxa having 30% or greater cover across all layers where these shrubs occur; or*
- 2b. *Two or more diagnostic Proteaceae taxa are present that are likely to form a significant vegetative component when regenerated. The use of diagnostic taxa is for situations in which the cover of Proteaceae taxa is reduced due to recent disturbance (e.g. fire).*

For all vegetation in the Study Area, criterion 1 is met as the Study Area is located within the Southeast Coastal Floristic Province. A total of 316.2ha of the TEC was found to occur in the Study Area, representing 18.9% of the Study Area (Figure 9); the TEC was also found to occur within the potential Development Envelope (Woodman Environmental, 2020).

Further detailed examination (at the quadrat level) by Woodman Environmental (2020) using the above parameters determined that VUs 16 and 17 represented the TEC as follows:

- VU 16: 5 of 7 quadrats (71 %) represent the TEC (3 satisfy 2a, 2 satisfy 2b);
- VU 17: 2 of 3 quadrats (67 %) of quadrats represent the TEC (both satisfy 2a);
- No quadrats from any other VUs satisfied Criterion 2, although a number of quadrats, almost all within VU 1, contained diagnostic species as very small components.

The extent of the TEC in the Study Area is therefore considered to be the extent of VUs 16 and 17 in the Study Area. It is considered unlikely that there are occurrences of the TEC within any other VUs; as outlined above, although some quadrats within VU 1 contain diagnostic species as very small components, no quadrats from any other VUs were considered to represent the TEC (Woodman Environmental, 2020).

Additionally, 57.8 ha of the TEC have been mapped outside the Study Area via extrapolation of VU mapping undertaken by Woodman Environmental (2020), all of which are extensions of polygons of VU 16 mapped in the Study Area. Most of the mapped area of the TEC in the Study Area and all of the extrapolated area is in Pristine condition; with 3.9 % (11.7 ha) considered to be in Good condition. All of the TEC mapped outside the Study Area via extrapolation is considered to be in Pristine condition.

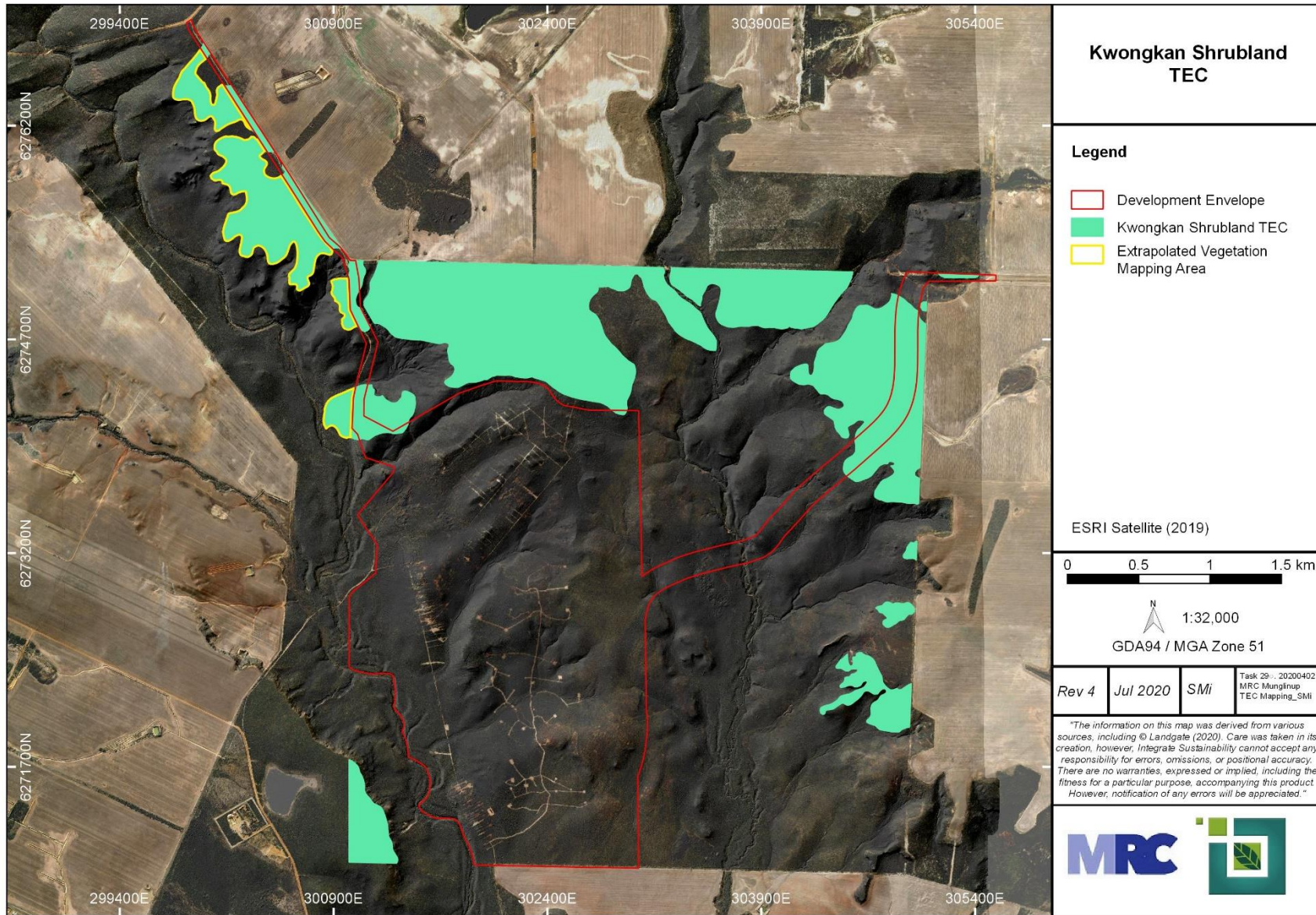


Figure 9 Location of Proteaceae Dominated Kwongkan Shrubland (TEC)

1.3.2.3. Locally Significant Vegetation Units

Of the 17 VUs mapped in the Study Area, 13 occur within the Development Envelope (Figure 10). Of these 13 VUs, the local conservation significance of the majority were ranked 'Low' (rankings 1 or 2), with higher local significance ranking of '3' given to VUs 7, 11 and 15, and '5' (highest ranking) to VU 5.

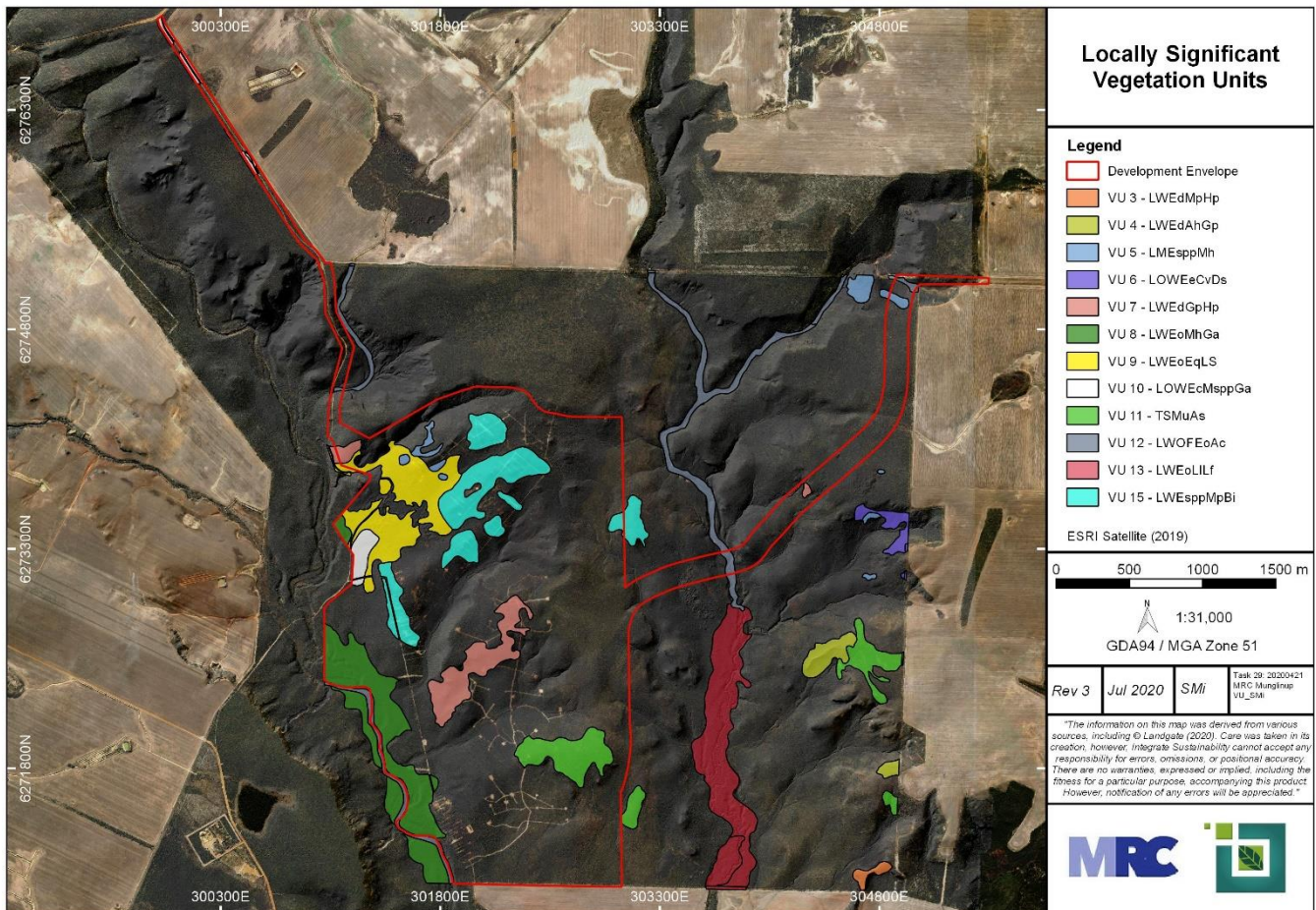


Figure 10 Locally Significant Vegetation Units

The local significance of impact to the 13 VUs in the Development Envelope. The local significance of impact is based on the matrix presented in Table 8 in Woodman Environmental, 2020. The outcome is based on the Local Conservation Significance which is a function of the area mapped and the landform/soil type upon which the VU occurs, with the scale of local impact which is based on the percentage of the VU to be impacted.

The significance of potential local impact to each VUs is ranked:

- Low for nine VUs (VUs 1, 2, 8, 9, 10, 12, 14, 16, 17); and
- Moderate-High for four VUs (VUs 5, 7, 11, 15).

However, in terms of local significance within the Disturbance Envelope, only VU 7 and 15 rank as moderate-high with greater than 50% of the VU expected to be impacted.

In a regional context, as a precaution, it is considered that all of the above-listed VUs are potentially regionally significant. They all have potentially restricted distributions and have potentially been historically impacted by threatening processes; this is in line with EPA guidance. Their restricted

distributions and degree of historical impact are a result of the significant amount of historical clearing for agriculture that has been undertaken in the vicinity of Munglinup, with vegetation restricted to isolated remnants; additionally, some of the VUs may potentially have had naturally restricted distributions. This inherently limits the potential extent of all VUs, as remnant vegetation as a whole is limited in extent.

Targeted searching within the surrounding region were conducted for a number of VUs mapped in the Study Area whose occurrences were primarily located within the Development Envelope. Several of the target VUs (2, 7, 8 and 9) were located immediately adjacent to the Study Area, with polygons of these VUs mapped via extrapolation. For the majority of target VUs, searching in the wider region surrounding the Project identified locations of vegetation that represent VUs similar to those onsite in a regional context, and potentially are floristically similar enough to also represent Study Area VUs in a local context. In the case of VU 2, and to a lesser extent VU 11, these occurrences appear to be extensive. VU 2 occurs on landforms not considered to be regionally restricted (low hills and valley slopes) and was therefore expected to occur elsewhere in the region.

The targeted survey was unsuccessful in locating any further occurrences of vegetation that potentially represents VU 15 in a local context (high floristic similarity), with one area identified as potentially representing this VU in a regional context (similar landform and soil association and comprising similar dominant flora).

Similarly, only one occurrence of vegetation that potentially represents VU 9 in a local context was located in the wider region; this occurrence likely represents this VU in a regional context. However, VU 9 was also mapped by extrapolation outside the Study Area.

A comparison between the vegetation units at Munglinup and Ravensthorpe Range regional vegetation dataset found that there was limited similarities; however, one VU (VU 15) is considered analogous to Ravensthorpe Range Community 11 in a regional context, with VU 15 and Community 11 considered to represent forms of a single regional vegetation type (Woodman Environmental, 2020).

Regional targeted survey for Study Area VUs resulted in areas of VUs being mapped immediately adjacent to the Study Area via extrapolation (many via the extension of Study Area VU polygons), as well as the identification of potential occurrences of these VUs in the wider region. The vegetation units are described in Table 4 below as per Woodman Environmental (2019) and (Woodman Environmental, 2020).

On a regional scale, the impacts to VU 7 are considered to be Low-Moderate and while for VUs 5 and 15 they are considered to be Moderate-High, being a combination of higher local significance, higher scale of impact and limited to no known regional extents.

Table 4 Locally Significant Vegetation Units

Vegetation Unit (VU)	Code	Description	> 50% within Development Envelope?	> 50% within Disturbance Footprint?
3	LWEdMpHp	Low mallee woodland dominated by <i>Eucalyptus densa</i> subsp. <i>densa</i> over tall shrubland dominated by <i>Melaleuca pentagona</i> var. <i>pentagona</i> and <i>Banksia media</i> over low sparse shrubland dominated by <i>Hibbertia pungens</i> on skeletal light brown clay loam with sandstone stones over sandstone outcropping on breakaways and ridges.	No	No
4	LWEdAhGp	Low mallee woodland of <i>Eucalyptus densa</i> subsp. <i>densa</i> over tall sparse shrubland dominated by <i>Acacia harveyi</i> and <i>Hakea laurina</i> over mid shrubland dominated by <i>Gastrolobium parviflorum</i> and <i>Melaleuca thapsina</i> over low shrubland dominated by <i>Dampiera</i> sp. Ravensthorpe (G.F. Craig 8277) (P3) on skeletal brown sandy loam with sandstone stones over sandstone outcropping on breakaways and ridges.	No	No
5	LMEsppMh	Low isolated mallees of mixed species including <i>Eucalyptus conglobata</i> subsp. <i>conglobata</i> and <i>Eucalyptus phaenophylla</i> subsp. <i>interjacens</i> over tall shrubland dominated by <i>Melaleuca hamata</i> , <i>Calothamnus quadrifidus</i> subsp. <i>quadrifidus</i> , <i>Melaleuca elliptica</i> and occasionally <i>Allocasuarina campestris</i> over mid to low open shrubland of mixed species dominated by <i>Astus tetragonus</i> , <i>Leucopogon cuneifolius</i> , <i>Philothea gardneri</i> subsp. <i>gardneri</i> and occasionally <i>Hybanthus floribundus</i> subsp. <i>adpressus</i> and <i>Grevillea anethifolia</i> over low open sedgeland of mixed species dominated by <i>Tetraria</i> sp. Mt Madden (C.D. Turley 40 BP/897), <i>Lepidosperma sanguinolentum</i> , <i>Lepidosperma</i> sp. Ravensthorpe (G.F. Craig 5188), <i>Lepidosperma</i> sp. 'Jerdacuttup (R.L. Barrett RLB 2770)' and <i>Gahnia aristata</i> on dark brown to brown clay loam with dolerite gravel and dolerite outcropping on upper and mid slopes of valleys.	No	No
6	LOWEeCvDs	Low open mallee woodland of mixed species dominated by <i>Eucalyptus ecostata</i> and <i>Eucalyptus pleurocarpa</i> over tall to mid shrubland of mixed species dominated by <i>Calothamnus villosus</i> , <i>Melaleuca hamata</i> , <i>Kunzea affinis</i> , <i>Acacia sulcata</i> var. <i>platyphylla</i> and <i>Melaleuca rigidifolia</i> over low sparse shrubland of mixed species dominated by <i>Darwinia</i> sp. Lake Cobham (K. Newbey 3262), <i>Leucopogon</i> sp. Newdegate (M. Hislop 3585), <i>Hemigenia teretiuscula</i> , <i>Philothea gardneri</i> subsp. <i>gardneri</i> and <i>Calytrix leschenaultii</i> over low open sedgeland of mixed species dominated by <i>Lepidosperma sanguinolentum</i> , <i>Lepidosperma</i> ?sp. Mt Short (S. Kern et al. LCH 17510) (P1), <i>Lepidosperma rigidulum</i> and <i>Lepidosperma</i> sp. 'Jerdacuttup (R.L. Barrett RLB 2770)' on brown sandy loam with sandstone gravel and stones and occasional sandstone outcropping on breakaways and ridges.	No	No
7	LWEdGpHp	Low mallee woodland to open forest dominated by <i>Eucalyptus densa</i> subsp. <i>densa</i> and occasionally <i>Eucalyptus flocktoniae</i> subsp. <i>flocktoniae</i> and <i>Eucalyptus phaenophylla</i> subsp. <i>interjacens</i> over tall to mid open shrubland of mixed species dominated by <i>Gastrolobium parviflorum</i> , <i>Calothamnus quadrifidus</i> subsp. <i>quadrifidus</i> , <i>Hakea lissocarpha</i> and occasionally <i>Melaleuca hamata</i> over low sparse shrubland of mixed species including <i>Hibbertia pungens</i> , <i>Hibbertia gracilipes</i> and <i>Lasiopetalum rosmarinifolium</i> over low sedgeland and forbland of mixed species including <i>Tetraria</i> sp. Mt Madden (C.D. Turley 40 BP/897),	Yes	Yes

Vegetation Unit (VU)	Code	Description	> 50% within Development Envelope?	> 50% within Disturbance Footprint?
		<i>Lepidosperma</i> sp. Ravensthorpe (G.F. Craig 5188), <i>Lepidosperma</i> sp. Bandalup Scabrid (N. Eveleigh 10798), <i>Lepidosperma</i> sp. 'Jerdacuttup (R.L. Barrett RLB 2770)' and <i>Stylidium albomontis</i> on red-brown or light brown sandy loam with sandstone gravel and sandstone outcropping on breakaways and ridges.		
8	LWEoMhGa	Low woodland of <i>Eucalyptus occidentalis</i> over tall open to sparse shrubland dominated by <i>Melaleuca hamata</i> and <i>Acacia cyclops</i> over mid open to sparse shrubland of mixed species including <i>Hakea lissocarpha</i> , <i>Melaleuca glaberrima</i> and <i>Hakea nitida</i> over low sparse shrubland of mixed species including <i>Lasiopetalum rosmarinifolium</i> , <i>Hibbertia gracilipes</i> , <i>Dodonaea caespitosa</i> and <i>Thomasia angustifolia</i> over low open to sparse sedgeland and rushland of mixed species dominated by <i>Gahnia ancistrophylla</i> , <i>Lepidosperma</i> sp. Bandalup Scabrid (N. Eveleigh 10798), <i>Lepidobolus preissianus</i> , <i>Lomandra micrantha</i> subsp. <i>teretifolia</i> and <i>Lepidosperma sanguinolentum</i> over low sparse forbland and grassland of mixed species including <i>Neurachne alopecuroidea</i> , <i>Chamaescilla corymbosa</i> var. <i>corymbosa</i> , <i>Goodenia affinis</i> , <i>Oxalis exilis</i> and <i>Lagenophora huegelii</i> on orange-brown clay or sandy loam on river flats.	No	No
9	LWEoEqLs	Low woodland of <i>Eucalyptus occidentalis</i> over low open mallee woodland of <i>Eucalyptus quadrans</i> over tall to mid open to sparse shrubland of mixed species including <i>Acacia glaucoptera</i> , <i>Hakea lissocarpha</i> , <i>Acacia cyclops</i> , <i>Melaleuca acuminata</i> subsp. <i>acuminata</i> and <i>Acacia verriculum</i> over low sparse shrubland of mixed species including <i>Thomasia foliosa</i> , <i>Dodonaea caespitosa</i> and <i>Phyllanthus calycinus</i> over low open to sparse sedgeland of mixed species dominated by <i>Lepidosperma</i> sp. Ravensthorpe (G.F. Craig 5188), <i>Tetraria</i> sp. Mt Madden (C.D. Turley 40 BP/897) and <i>Lomandra effusa</i> over low sparse forbland of mixed species including <i>Lysimachia arvensis</i> , <i>Chamaescilla corymbosa</i> var. <i>corymbosa</i> , <i>Goodenia affinis</i> , <i>Oxalis exilis</i> and <i>Plantago hispida</i> on brown clay loam with quartz gravel on valley slopes.	No	No
10	LOWEcMsspGa	Low open mallee woodland dominated by <i>Eucalyptus conglobata</i> subsp. <i>conglobata</i> and occasionally <i>Eucalyptus phaenophylla</i> subsp. <i>interjacens</i> over tall to mid shrubland to open shrubland of mixed species dominated by <i>Melaleuca hamata</i> and <i>Melaleuca lateriflora</i> , and occasionally <i>Melaleuca glaberrima</i> , <i>Santalum acuminatum</i> and <i>Acacia cyclops</i> , over low sparse shrubland of mixed species including <i>Lasiopetalum rosmarinifolium</i> , <i>Dodonaea caespitosa</i> and <i>Hakea lissocarpha</i> over low open to sparse sedgeland, forbland and rushland of mixed species dominated by <i>Gahnia ancistrophylla</i> , <i>Tetraria</i> sp. Mt Madden (C.D. Turley 40 BP/897), <i>Lepidosperma</i> sp. Carracarrup Creek (S. Kern, R. Jasper, D. Brassington LCH 16738), <i>Lepidobolus preissianus</i> and <i>Opercularia vaginata</i> on red-brown or brown clay loam with dolerite and occasionally quartz stones on valley flats and slopes.	No	No
11	TSMuAs	Tall to mid open to sparse shrubland dominated by <i>Melaleuca uncinata</i> over mid to low shrubland to open shrubland of mixed species dominated by <i>Acacia sulcata</i> var. <i>platyphylla</i> , <i>Melaleuca elliptica</i> and <i>Astus tetragonus</i> over low sparse shrubland of mixed species including <i>Leptospermum oligandrum</i> and <i>Styphelia</i> sp. Cascades (R. Davis 11037) on brown clayey sand or clay loam with granite and quartz stones and often granite outcropping on low rises and slopes.	Yes	No

Vegetation Unit (VU)	Code	Description	> 50% within Development Envelope?	> 50% within Disturbance Footprint?
12	LWOFEOAc	Low woodland to open forest dominated by <i>Eucalyptus occidentalis</i> and <i>Melaleuca cuticularis</i> over tall open shrubland of mixed species dominated by <i>Acacia cyclops</i> , <i>Acacia saligna</i> subsp. <i>lindleyi</i> ms and <i>Labichea lanceolata</i> subsp. <i>brevifolia</i> over low open to sparse sedgeland of mixed species including <i>Chorizandra enodis</i> , <i>Gahnia trifida</i> and <i>Juncus pallidus</i> over occasional low sparse chenopod shrubland dominated by <i>Salicornia quinqueflora</i> subsp. <i>quinqueflora</i> , <i>Suaeda australis</i> and <i>Disphyma crassifolium</i> subsp. <i>clavellatum</i> over low sparse forbland of mixed species including <i>Cotula australis</i> and * <i>Cotula coronopifolia</i> on grey-brown to clay or clay loam in narrow drainage line channels.	No	No
13	LWEoLILf	Low woodland dominated by <i>Eucalyptus occidentalis</i> over tall to mid shrubland to closed shrubland of mixed species dominated by <i>Labichea lanceolata</i> subsp. <i>brevifolia</i> , <i>Acacia cyclops</i> , <i>Acacia sulcata</i> var. <i>platyphylla</i> and <i>Grevillea anethifolia</i> over low sparse shrubland of mixed species including <i>Thomasia angustifolia</i> and <i>Thomasia foliosa</i> over low sparse sedgeland dominated by <i>Lepidosperma fimbriatum</i> and <i>Lepidosperma</i> sp. Bandalup Scabrid (N. Eveleigh 10798) over low sparse forbland of mixed species including <i>Dichondra repens</i> , <i>Cotula australis</i> and <i>Oxalis exilis</i> on yellow-brown to light brown sand or sandy clay in broad drainage lines and adjacent flats.	No	No
15	LWEspMpBi	Low mallee woodland dominated by <i>Eucalyptus flocktoniae</i> subsp. <i>flocktoniae</i> , <i>Eucalyptus conglobata</i> subsp. <i>conglobata</i> and <i>Eucalyptus indurata</i> over tall to mid shrubland dominated by <i>Melaleuca pauperiflora</i> subsp. <i>pauperiflora</i> and occasionally <i>Choretrum glomeratum</i> , <i>Dodonaea stenozyga</i> and <i>Pultenaea calycina</i> subsp. <i>proxena</i> (P4) over low shrubland dominated by <i>Boronia inornata</i> subsp. <i>inornata</i> on grey or grey-brown clay loam with calcareous stones on low rises on undulating plains.	Yes	No

1.4. Condition Requirements

No conditions currently exist for the Project. This management plan is being submitted to support the environmental assessment currently underway under s38 of the *Environmental Protection Act 1986* and Part 9 of the *Environmental Protection and Biodiversity Conservation Act 1999*. MRCG has taken into consideration the environmental objectives set for *Flora and Vegetation* and are committed to implementing the Project in a manner that meets these objectives.

1.5. Rationale and Approach

Results of baseline surveys and several assumptions and uncertainties inform the management approach for meeting the environmental objective stated in Section 2.1, along with information sourced from the Woodman Environmental impact assessment memo (Western Ecological, 2020 (b)). The identified management actions, management targets, monitoring and reporting objectives are aligned with the overall management approach.

1.5.1. Survey and Study Findings

A number of surveys undertaken over the Project area and surrounding environment have informed this section, these surveys and studies are outline in Table 5.

Table 5 Baseline Flora and Vegetation Studies and Surveys completed for the Munglinup Graphite Project

Survey or study	Year
Ecologia Environmental. Munglinup Graphite Project Flora and Fauna Assessment	2015
Woodman Environmental. Peer Review of Consultant Report Level 2 Flora and Vegetation Assessment in the Munglinup Area	2018
Woodman Environmental. Munglinup Graphite Project Flora and Vegetation Assessment – Interim Report: Survey for TEC ‘Proteaceae Dominated Kwongan Shrublands of the southeast coastal floristic province of Western Australia’ and habitat for the Threatened taxon <i>Rhizanthella johnstonii</i>	2018
Woodman Environmental. Desktop Review of Potential Regional Extent of Vegetation Units	2019
Woodman Environmental. Detailed L2 Flora and Vegetation Assessment	2020
Woodman Environmental. Munglinup Graphite Project Flora and Vegetation Impact Assessment Memo.	2020

1.5.1.1. Climate

The Project is located on the South Coast in the Goldfields-Esperance Development Region of Western Australia. The climate of this region is temperate Mediterranean with warm summers and mild to cool winters.

Temperatures and rainfall data were retrieved from the Bureau of Meteorology (BoM) weather recording station at Munglinup West (station number 012044) from 2002 to 2020. The mean annual monthly temperature maximum recorded at the station is 23.3°C and minimum is 10.6°C. On average the warmest month of the year is January with a mean maximum temperature of 29°C. July is the coolest month with a mean minimum temperature of 6.6°C.

The mean annual rainfall is 450.8mm, with the lowest average monthly rainfall being 26.8mm in December, and the highest average monthly rainfall being 47.2mm in August (BOM, 2020) Figure 11 presents the typical climate information associated with the Munglinup West weather station. Average dam evaporation exceeds average rainfall in all months of the year by a factor of three (Luke, Burke, & O'Brien, 1988).

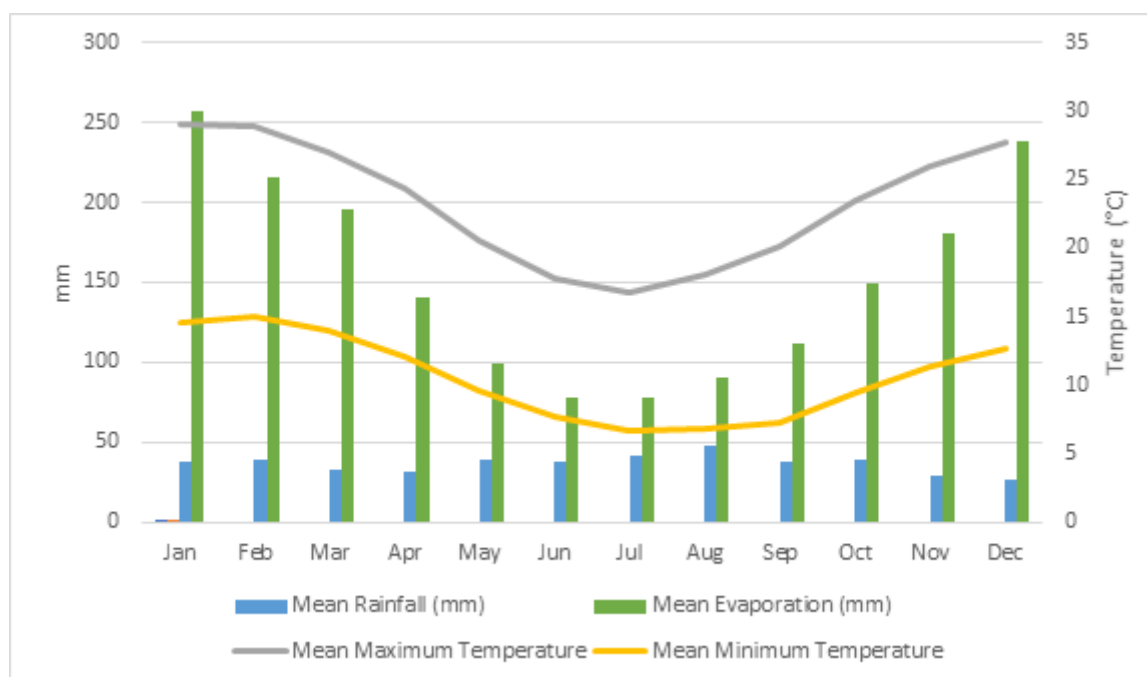


Figure 11 Mean Temperature and Rainfall Recorded at Munglinup West from 2002 to 2020 (BoM, 2020)

1.5.2. Key Assumptions and Uncertainties

The Project area has been subject to several baseline surveys of flora and vegetation communities including a targeted survey focusing on the Proteaceae Dominated Kwongkan Shrublands and the Western Underground Orchid. It is assumed that the studies and management plans have been developed adequately.

Key Assumptions:

- The baseline surveys conducted (Table 5) provide sufficient information to confirm the presence or absence of the species listed in Table 6.
- Flora and vegetation surveys were completed in compliance with EPA requirements and MRCG agreed upon scope of work.
- The level of survey was limited to the Project area, so it is considered there are likely to be more listed flora and vegetation species and TEC in close proximity.

Key Uncertainties:

- No systematic holistic surveys have been undertaken across the region. Detailed surveys are mostly limited to baseline surveys that have been conducted for mining or major land clearing operations. This majority of detailed surveys in the region have been from mining and major land clearing activities. Therefore, the distribution of the described flora species and the TEC outside of the project area are generally known but fractured, creating uncertainties.

1.5.3. Management Approach

This *Flora and Vegetation Management Plan* has been developed to address the key environmental factors of *Threatened Flora and Vegetation*. The management approach taken in this management plan is risk-based and developed around the mitigation hierarchy of avoid, minimise, rehabilitate and offset, to ensure impacts to the key environmental factors have been avoided or reduced to as low as reasonably practicable. Mitigation and management actions have been identified and prioritised using

the information gathered from baseline surveys and other regional and local information within the public domain.

1.5.4. Rationale for Choice of Provisions

The management approach is informed by results of baseline surveys and the Project parameters and the information from the Flora and Vegetation EIA (Woodman Environmental, 2020(b)). The Project aim to minimise the Project footprint over the operations life, with priority given to using areas of existing disturbance and progressive rehabilitation.

Management and mitigation measures have been designed for the life of the mine, and as such, may require adaptive solutions in subsequent revisions. Management targets are based on:

- Survey outcomes, both local and regional, including:
 - Present of threatened or priority flora and vegetation communities.
 - Vegetation condition and drainage lines.
 - Presence of weed species and other anthropomorphic factors.
- Proposal activities including:
 - Construction of mine site infrastructure.
 - Clearing of vegetation.
 - General operational phase activities.
 - Ongoing exploration and extension of mine life.
 - Closure and rehabilitation practices.
- Industry best practice.
 - Phased clearing and progressive rehabilitation.
 - Regular inspections and maintenance schedules.
 - Environmental auditing and reporting strategies.

2. Environmental Management Plan Provisions

This section identifies the provisions that MRCG proposes to implement to ensure protection of the significant flora and vegetation communities. It identifies the environmental criteria that will be used to measure performance and monitoring that will be undertaken in relation to these environmental criteria. It also defines the response actions (trigger level and contingency actions) that will be undertaken if the environmental criteria are exceeded.

A summary of the Significant Flora and Vegetation Units addressed by these provisions, and the associate conservation status and likelihood of occurrence is described in Table 6, while Table 7 details the provisions of this management plan.

Table 6 Significant Flora and Vegetation Communities Requiring Management

Threatened and Priority Flora and Vegetation	Conservation Status		
	WA	EPBC Act ranking	Other
<i>Conostylis lepidospermoides</i>	Threatened	Vulnerable	Nil
<i>Lepidosperma</i> sp. Mt. Chester (S. Kern et al. LCH 16596)	Priority 1	Not Listed	Nil
<i>Leucopogon</i> sp. Cascades (M. Hislop 6393)	Priority 1	Not Listed	Nil
<i>Commersonia rotundifolia</i>	Priority 3	Not Listed	Nil
<i>Pultenaea calycina proxena</i>	Priority 4	Not Listed	Nil
<i>Leucopogon</i> aff. <i>canaliculatus</i>	Not Listed	Not Listed	Potential new taxon
<i>Synaphea</i> aff. <i>drummondii</i>	Not Listed	Not Listed	Potential new taxon

Threatened and Priority Flora and Vegetation	Conservation Status		
	WA	EPBC Act ranking	Other
<i>Synaphea</i> sp. Jilakin Flat Rocks Rd (R. Butcher et. al RB200)	Not Listed	Not Listed	Potential new taxon
Proteaceae Dominated Kwongkan Shrublands (VU 16 and VU 17)	PEC – Priority 3	TEC - Endangered	Nil
VU 5 LMEsppMh	Not Listed	Not Listed	Locally / Regionally Significant
VU 7 LWEdGpHp	Not Listed	Not Listed	Locally / Regionally Significant
VU 11 TSMuAs	Not Listed	Not Listed	Locally / Regionally Significant
VU 15 LWEsppMpBi	Not Listed	Not Listed	Locally / Regionally Significant

2.1. Management-based Provisions

2.1.1. Objectives

The objective of this Management Plan is to ensure the Project is managed to maintain local flora and vegetation communities and their biological diversity and ecological integrity; with a focus on the species and communities listed in Table 6, such that the EPA objective for flora and vegetation is met.

2.1.2. Management Actions

To meet the over-arching Project objectives, a series of Project specific, risk-based management actions have been developed and prioritised based on risk in order to minimise potential impacts to flora and vegetation communities. The management actions have been identified to address potential impacts detailed in Table 3 and the management actions focus on proposed activities that have the likelihood of causing adverse impacts to:

- *Commersonia rotundifolia* (P3)
- *Pultenaea calycina proxena* (P4)
- *Stachystemon vinosus* (P4)
- *Leucopogon* aff. *canaliculatus* (potential new taxon)
- *Synaphea* aff. *drummondii* (potential new taxon)
- *Synaphea* sp. Jilakin Flat Rocks Rd (R. Butcher et. al RB200) (potential new taxon)
- Proteaceae dominated Kwongkan Shrublands of the Southeast Coastal Floristic Province of Western Australia
- Locally / Regionally significant vegetation units such as VU 5, VU 7, VU 11 and VU 15.

Risk assessment tables are provided as Appendix 1.

The residual risk rating remains moderate for four management objectives:

- Habitat loss and fragmentations due to clearing – the Project area contains some areas of PEC and priority flora species, so all populations surveyed are considered significant.
- Increased risk of fire.
- Increase risk of invasive species (weeds and dieback).
- Off-road driving causing damage to flora and vegetation.

However, land clearing is considered to be the most important factor in the continuing decline of conservation significant species (of both flora and fauna), therefore is considered the highest priority for management. The potential impacts to conservation significant flora and ecological communities are related to how much habitat is available locally (in the development envelope and adjacent survey area) and regionally, the flora they support and the degree of impact from the proposed development (the assumption here is removal of vegetation) (Woodman Environmental, 2020(b)).

2.1.3. Management Targets

Measurable management targets have been developed to ensure management actions are effective. If management targets are met, then impacts on the priority and significant flora and vegetation communities listed will be minimised and the EPA's environment objective for flora and vegetation will be achieved.

Habitat loss and fragmentation resulting from clearing is identified as having the greatest potential to impact on the flora and vegetation communities through the potential for direct loss of individuals and communities. This impact is anticipated to be minimised by limiting the amount of clearing and implementing progressive rehabilitation.

Management objectives, targets, actions and reporting are listed in Table 7 and Table 8.

Table 7 EMP Values, Impacts and Outcomes

EPA factor and objectives:	<i>Flora and Vegetation</i> – to protect flora and vegetation so that biological diversity and ecological integrity are maintained
Key environmental values:	<p>Significant flora including regionally significant species:</p> <ul style="list-style-type: none"> • <i>Conostylis lepidospermoides</i> (Threatened). • <i>Lepidosperma</i> sp. Mt Chester (S. Kern et al. LCH 16596) (P1). • <i>Leucopogon</i> sp. Cascades (M. Hislop (3693) (P1). • <i>Commersonia rotundifolia</i> (P3). • <i>Pultenaea calycina</i> subsp. <i>proxena</i> (P4). • <i>Stachystemon vinosus</i> (P4). • <i>Leucopogon</i> aff. <i>canaliculatus</i> (potential new taxon). • <i>Synaphea</i> aff. <i>Drummondii</i> (potential new taxon) and • <i>Synaphea</i> sp. Jilakin Flat Rocks Rd (R. Butcher et. Al RB200) (potential new taxon). <p>Significant Vegetation Communities and units:</p> <ul style="list-style-type: none"> • Proteaceae dominated Kwongkan Shrubland (VU 16 and V17) • Locally / Regionally significant vegetation units such as VU 7, and VU 15.
Key impacts and risks:	<ul style="list-style-type: none"> • Clearing and unintentional clearing of individual plants or populations during clearing and off-road activities. • Weed invasion and spread through clearing, construction increased vehicle usage and lack of or poor hygiene procedures. • Introduction/spread of dieback through clearing, construction, increased vehicle usage and lack of, or poor hygiene procedures. • Changed fire regimes. • Changes to surface water flows potentially impacting on vegetation and flora which are dependent on these flows. Habitat fragmentation from land clearing and associated isolation of populations and reduced gene flow. • Dust suppression impacts to flora and vegetation from overspray and run off. • Spillages of tailings or hypersaline water. • Water drawdown impacts on groundwater dependent ecosystems.
Outcome:	<ul style="list-style-type: none"> • Minimise the potential for clearing to cause significant damage, degradation or unlawful loss to the Proteaceae Dominated Kwongkan Shrubland TEC and other conservation significant flora listed above. • Where practical minimise clearing of VU 5, VU 7, VU 11 and VU 15. • Minimise the introduction of invasive weed species through the Project area. • Minimise dust emissions across the Project area. • Minimise clearing which could cause fragmentation. • No increase in fire frequency or intensity. • Minimise the risk to flora and vegetation from unauthorised off-road driving.

Table 8 Management Based Provisions

Management Objective	Management Targets	Management Actions	Timeframe/Phase	Reporting
Minimise the potential for clearing to cause significant damage, degradation or unlawful loss to the Proteaceae Dominated Kwongkan Shrubland TEC or other conservation significant flora.	Minimal unauthorised or accidental clearing of significant flora individuals and populations.	<ul style="list-style-type: none"> • Implement an internal ground disturbance / clearing permit procedure to avoid unauthorised clearing. • Minimise disturbance to conservation significant species and habitat outline in Table 6 when planning and implementing the project. • The indirect impact to <i>Leucopogan</i> aff. <i>canaliculatis</i>, <i>Synaphea</i> aff. <i>drummondii</i> and <i>Synaphea</i> sp. Jilakin Flat Rocks Rd (R. Butcher et. al RB200) will be limited to no more than nine individuals directly impacted. • Where the Proteaceae Dominated Kwongkan Shrubland TEC has been recorded, the following actions will be undertaken: <ul style="list-style-type: none"> ▪ The boundary of the TEC will be survey and marking out in the field. ▪ It will be incorporated into the mine plan. ▪ Its identification and management will be incorporated into the environmental education package. • Undertake rehabilitation activities that encourage the re-establishment of significant and restricted species and community. • If areas containing the Kwongkan Shrubland TEC are cleared, the following actions will be undertaken to maximise rehabilitation: <ul style="list-style-type: none"> ▪ Vegetation will be stockpiled separately, and sign posted. ▪ Growth Medium will be collected and stockpiled to prevent the loss of the seedbank. ▪ Topsoil will be stockpiled and preserved for rehabilitation. ▪ Appropriate seed mix will be used to promote rehabilitation. • Undertake field searches during operations to locate additional populations of conservation significant 	<ul style="list-style-type: none"> ▪ Planning. ▪ Construction. ▪ Operations. ▪ Closure and rehabilitation. ▪ Anytime clearing is undertaken. 	<ul style="list-style-type: none"> • Pre-clearance surveys. • Incident reporting. • Internal clearing permits. • Clearing register. • TEC and Threatened Species Register. • Annual Environmental Report.



Management Objective	Management Targets	Management Actions	Timeframe/Phase	Reporting
		<p>species located solely within the development envelope.</p> <ul style="list-style-type: none"> Undertake field searches during operations to locate additional occurrences of locally and regionally significant vegetation units or similar vegetation units. 		
Where practical minimise clearing of VU 7, VU 11 and VU 15	Minimal unauthorised or accidental clearing of VU 7, VU 11 and VU 15.	<ul style="list-style-type: none"> Where, VU 7, VU 11 and VU 15 has been identified the following actions will be undertaken: <ul style="list-style-type: none"> It will be avoided as far as practicable The area will be surveyed and signage erected If, VU 7, VU 11 and VU 15 have to be cleared, the following will be undertaken: <ul style="list-style-type: none"> Vegetation will be stockpiled separately, and sign posted. Topsoil will be stockpiled and preserved for rehabilitation. 	<ul style="list-style-type: none"> Planning. Construction. Operations. Closure and Rehabilitation. Anytime clearing is undertaken. 	<ul style="list-style-type: none"> Pre-clearance surveys. Incident reporting. Internal clearing permits. Clearing register. Annual Environmental Report.
Minimise the introduction of invasive weed species through the Project area.	Minimal new weeds introduced to site.	<ul style="list-style-type: none"> Implement a Vehicle Hygiene Procedure which includes requirements for vehicles to be washed down prior to deployment to site, washdown bays on site, frequent use of washdown. Implementation of invasive species control, if deemed necessary. Provide education and training to employees on weed management. Review existing weed occurrences and signpost areas of significant weed infestation. 	<ul style="list-style-type: none"> Construction. Operations. Rehabilitation. Closure. 	<ul style="list-style-type: none"> Washdown/vehicle hygiene certificates. Invasive species control reports. Annual Environmental Report.
Minimise dust emissions across the Project area.	Minimal death or decline in vegetation health due to dust.	<ul style="list-style-type: none"> Dust will be reduced on site through stabilisation of topsoil stockpiles, implementation of speed limits on unsealed roads, and application of dust suppression methods along roads and on stockpiles. Conveyors will incorporate dust control strategies to minimise dust. Watercarts or fixed spray sprinklers will be implemented to minimise dust off ROM Pad and stockpiles. 	<ul style="list-style-type: none"> Construction. Operations. Rehabilitation. Closure. 	<ul style="list-style-type: none"> Incident reports of speeding. Visual dust monitoring. Annual Environmental Report. Incident report of significant dust plumes. Quarterly and annual vegetation monitoring.



Management Objective	Management Targets	Management Actions	Timeframe/Phase	Reporting
Minimise clearing which could cause fragmentation.	No clearing outside approved clearing areas. Progressive rehabilitation undertaken.	<ul style="list-style-type: none"> • Where practicable design infrastructure and site layout to avoid listed threatened and/or conservation significant species, vegetation, and the Proteaceae Dominated Kwongkan Shrubland TEC. • Where practicable the site layout will be designed to create vegetation corridors. • Develop and implement an internal clearing permit procedure (to include flagging of clearing areas, supervision of clearing by suitably qualified environmental professional, reporting of unauthorised clearing). • Undertake progressive land clearing with the amount of active disturbance minimised. • Undertake progressive rehabilitation in accordance with the site Mine Closure Plan. • Where possible, direct placement of topsoil and vegetation will be respread over rehabilitated areas. 	<ul style="list-style-type: none"> • Planning. • Construction. • Operations. 	<ul style="list-style-type: none"> • Clearing Register. • Internal clearing permits. • Survey data. • Annual Environmental Report.
No increase in fire frequency or intensity.	No fires attributed to mining and associated activities.	<ul style="list-style-type: none"> • Undertake regular maintenance of fire breaks and implement fire management procedures (e.g. Hot Work Permit system, firefighting training, Emergency Response Plan) to avoid increases in fire frequency. • Install firefighting equipment on site and in all vehicles. • Install lightning protection equipment as part of Project design where necessary. • Vehicles are not permitted to leave access tracks or cleared areas, except authorised vehicles such as environment, safety officer or other vehicles that do the work on that area. • MRCG will work with DFES and DBCA to undertake prescribed burns if deemed necessary. • Undertake staff training and awareness programs to provide information on the prevention and management of fires. 	<ul style="list-style-type: none"> • Construction. • Operations. • Rehabilitation. • Closure. 	<ul style="list-style-type: none"> • Aerial photos. • Incident reports.



Management Objective	Management Targets	Management Actions	Timeframe/Phase	Reporting
<p>Minimise the risk to flora and vegetation from unauthorised off-road driving.</p>	<p>Minimal damage or death attributed to off-road driving.</p>	<ul style="list-style-type: none"> • Avoid accidental disturbance to conservation significant flora by enforcing strict traffic management rules such as: <ul style="list-style-type: none"> ▪ Keeping to designated tracks. ▪ Reduced speed limits. ▪ Prohibiting access to native vegetation areas except for monitoring purposes. ▪ Signed no-go areas. 	<ul style="list-style-type: none"> • Construction. • Operations. • Rehabilitation. • Closure. 	<ul style="list-style-type: none"> • Incident reports of speeding, unauthorised off-road driving. • Incident reports of accidental damage/clearing of vegetation. • Internal audits and inspections of vehicle speeds. • Annual Environmental Report. • Quarterly and annual vegetation monitoring.

2.1.4. Monitoring

The following monitoring will be undertaken for this *Flora and Vegetation Management Plan*:

- Biennially visual monitoring will take place on the Proteaceae Dominated Kwongkan Shrubland TEC, written and photographic records will be taken and kept of visual inspections.
- Annual vegetation health monitoring of the Kwongkan Shrubland TEC will be implemented. Monitoring will be undertaken using photo monitoring. Compliance of hygiene procedures will be periodically audited.
- Monitoring the edge of the whole cleared boundary, including the Kwongkan Shrubland TEC, will be implemented across the site on a triennial basis by a qualified, registered dieback interpreter.
- Annual monitoring of significant flora species listed as key values in Table 7.
- Annual monitoring will continue until completion of rehabilitation activities.

Where there is evidence of management targets not being met, or a trigger value being breached (e.g. unauthorised clearing of Proteaceae Dominated Kwongkan Shrubland TEC) management measures will be reviewed to ensure further clearing or declines do not occur.

2.1.5. Reporting

This FVMP sets out the reporting requirements relating to the implementation of the Plan. Reporting includes:

- Preparation of the Annual Environmental Report (AER) to be submitted to the appropriate regulatory authorities. The AER will include monitoring results and trends as compared to trigger and threshold criteria.
- Provision of data (annually) from monitoring programs to relevant regulatory authorities.
- In the event that a management target is exceeded (or not met), the relevant regulatory authorities will be notified within 7 days of identification of the exceedance, including threshold contingency actions which have been implemented due to the exceedance of threshold criteria.

3. Adaptive Management and Review of the EMP

This Management Plan has defined the issues, outlined management and mitigation measures to address the issues, and introduced monitoring and evaluation of these measures.

The management approach for this management plan, although management based, will be adaptive. The management plan will be reviewed on an annual basis by a suitably qualified experienced person. In addition to this formal annual review, the *Flora and Vegetation Management Plan* will be reviewed if:

- New information is learned from monitoring, or monitoring indicates that management targets are not being achieved.
- New information becomes available about any of the managed species i.e. change in conservation status.
- There is a change in the project description i.e. an increase to the disturbance area.

4. Stakeholder Consultation

Early engagement has allowed MRCG to understand the community in which they are working and identify key stakeholders that will be impacted by or impact the Project, including:

- State Government.

- Federal Government.
- Local Government.
- Non-government organisations and interested parties.
- Adjoining landowners and local communities e.g. Munglinup.
- Traditional owners from the local Aboriginal groups.

MRCG is committed to open and transparent communication with its stakeholders throughout the life of the mine from development approval through to construction, operation and mine closure. The objectives for this communication are as follows:

- To manage expectations by ensuring the communities and relevant stakeholders fully understand the nature of the Project, including the likely impacts and benefits that may be derived from Project operations.
- To promote community confidence in MRCG, as an organisation, and the Project by ensuring open and transparent communication of Project development processes, impacts and risk management processes
- To ensure a sustainable Project design and decision making by incorporating local community knowledge, views and concerns.
- To enable MRCG to identify and address community concerns proactively and in collaboration with the community.
- To adopt a good neighbour policy.

A Community Engagement Plan has been developed to enable MRCG to meet these objectives and outline the appropriate stakeholder engagements.

Whilst not specific to this FMP, ongoing stakeholder consultation has been underway since February 2018, with 2 community events held in Munglinup and Esperance in August 2018 to provide an overview of the Project and environmental studies conducted. An example summary of stakeholder concerns in relation to flora and vegetation is described below. Additional stakeholder engagement activities are planned and will be undertaken as per the Community Engagement Plan.

Table 9 Stakeholder Interest and Engagement Summary

Date	Stakeholder	Comments & Advice	Response
15-Feb-2021	DWER DAWE	<ul style="list-style-type: none"> Feedback from the Additional information report received via email. •Novel Flora Species (DWER) - Additional discussion and mitigation of the potential impacts to the three potentially novel taxa found in the project area - Further discussion and mitigation of the potential consequences of the introduction of Phytophthora dieback on the novel flora species 	Meetings set up with DWER for further clarification. Clarification received by agency and applied to revising the additional information report.
24-Sep-2020	EPA Services DAWE	<ul style="list-style-type: none"> • Offsets of TEC 	<ul style="list-style-type: none"> • Offsets have been reviewed and submitted for the TEC
24-Sep-2020	DWER DAWE	<p>Supporting Information Document, key matters for revision to meet EPA services requirements:</p> <ul style="list-style-type: none"> • Flora and Vegetation: - Additional discussion and mitigation of the potential impacts to the three potentially novel taxa found in the project area - Further discussion and mitigation of the potential consequences of the introduction of Phytophthora dieback on flora and vegetation - Please provide a consideration of the offsets required for impacts to listed conservation significant fauna species found within the development envelope 	<ul style="list-style-type: none"> • Detailed comments were formed from the Government agencies reviewing the proposal. Each of the advised actions to be addressed on revision of the additional information report. • Supplementary report document to be updated by ISPL with addition information required from baseline providers and MRCG. • Meeting with MRCG and Government departments arranged to clarify requirements.
21-Feb-2020	Esperance Community Land-owners/ Community members, Key Stakeholders, Local Government and industry Groups.	<p>The community briefing was attended by 120 people, the briefing provided an overview of the upcoming events, process and information on the construction and running of the mine.</p> <ul style="list-style-type: none"> • Update on proposal aspects – processing methodology, mine life, vehicle access routes, environmental and heritage process, timeline of project. <p>Community engagement.</p>	<p>Feedback/Concerns raised included:</p> <ul style="list-style-type: none"> • Waste Landform design • Life of Mine • Final rehabbed form • Recovery process of graphite • Trucking to Fremantle rather than Esperance • Fire mitigation process <p>Likelihood of mine proceeding.</p>

Date	Stakeholder	Comments & Advice	Response
21-Feb-2020	Esperance LEAF Community Group.	<p>This meeting was attended by 5 members from the Local Environmental Action Forum (LEAF).</p> <p>A brief introduction was given from LEAF to their organisation and history, and what they do for the area.</p>	<p>Feedback/Concerns raised included:</p> <ul style="list-style-type: none"> • What graphite is used for? • What will Munglinup's graphite be used for? • Safety for transport of graphite bulka bags • Quenda populations • Monitoring of the Munglinup River • Release of excess water and quality • Groundwater draw and effect on the river • How the site will be powered <p>How will stockpiles be stored.</p>
20-Feb-2020	Landowners/ Community members, Key Stakeholders, Local Government and industry Groups	<p>The community briefing was attended by 14 people, the briefing provided an overview of the upcoming events, process and information on the construction and running of the mine.</p> <ul style="list-style-type: none"> • Update on proposal aspects – processing methodology, mine life, vehicle access routes, environmental and heritage process, timeline of Project. <p>Community engagement.</p>	<p>Feedback/Concerns raised included:</p> <ul style="list-style-type: none"> • Road design and use • life of mine • mining methods • TSF design and use • Air quality concerns <p>Draw on community-based emergency services.</p>
25 May 2019	Shire of Ravensthorpe	<p>The Shire Ravensthorpe expressed concern regarding the timelines and difficulties in obtaining environmental approvals, especially in respect to native vegetation clearing permits.</p>	<p>MRCG advised that it has been working closely with the relevant government agencies to address the matters set out in the EPA assessment and achieve an outcome that ensures that any potential environmental impacts are managed appropriately.</p>
17 Mar 2019	DOEE – Mr G Manning	<p>Letter from DOEE (after referral) indicating that the proposed project is likely to have a significant impact matters protected by the EPBC Act (Listed threatened species and communities under sections 18 & 18A) including Proteaceae Dominated Kwongkan Shrublands – Endangered. Therefore, the project shall provide an assessment on the direct and indirect impacts to these species.</p>	<p>Agreed – MRCG will undertake the required assessments.</p>
11 Oct 2018	EPA – Mr R Hughes and Mr M Pearse	<p>The EPA raised the question surrounding GDE's including subterranean and terrestrial.</p> <ul style="list-style-type: none"> • The EPA raised the point that from a legal perspective if the TEC is within the development envelope it will be 	<ul style="list-style-type: none"> • ISPL provided that the geology is not suitable for subterranean fauna and that terrestrial GDEs are currently being examined. • The comment was made that the development envelope could be adjusted to remove more of the TEC.

Date	Stakeholder	Comments & Advice	Response
		<p>considered as being cleared even if it is not within the disturbance envelope.</p> <ul style="list-style-type: none"> • The comment was made that State listed TECs may require an offset. • It would be worth examining this project from a Holistic Impact Assessment to encompass the TEC, Carnaby's and other species. • The EPA indicated that if there is uncertainty regarding any of the studies or factors such as new species, additional information would be required, and this may mean additional surveys. 	Other comments in relation to the EPA process and assessment pathways were noted.
21 Sept 2018	DMIRS - Mr R Hepworth	<p>POW76073 – There was concern regarding the lack of vegetation mapping on the eastern side of the mining reserve where the proposed eastern access track would extend. Confirmation requested on the extent of the TEC on this side and if it would be impacted.</p> <p>POW74373 – Updated TEC mapping shows that a large drilling polygon which has already been approved covers an extent of the TEC in the north of M74/245. Confirmation requested regarding if this activity has commenced and/or will proceed and notification that a clearing permit is required for the clearing of the TEC.</p>	<p>POW76073 – Provision of an updated report by Woodman Environmental which covers the extent of the TEC on the eastern side. The access track does pass through the TEC and will require a clearing permit to proceed as it is classed as an Environmentally Sensitive Area. Further information on the extent of the TEC to be requested from Woodman Environmental. The possibility of using the existing firebreak as the road corridor was suggested which could utilise the clearing exemptions, further information is required to confirm if this is a viable option. To allow the POW to be processed the best way forward is to resubmit the POW with the eastern access track removed so that the other activities can be assessed and approved. The eastern access track can be resubmitted as a separate POW at a later date. POW76253 has been submitted to cover the activities minus the access road.</p> <p>POW74373 – Clearing of the TEC requires a clearing permit. Discussion that sterilisation drilling in this northern polygon is no longer required by MRCG due to the identification of the TEC in this area. DMIRS requested written confirmation that this was the case and the TEC would not be cleared.</p>
25 July 2018	Landholder - Mr A Tucker	Woodman Environmental Consulting had requested access to the Tucker property immediately adjacent to the eastern boundary of the Mining Reserve in order to carry our flora survey work. Access was difficult inside the Reserve due to thick vegetation and the fire break having been grown over.	Mr Tucker advised that at this stage they would not be granting access. However, it was also agreed that we would arrange a follow up meeting during the week ending 4 August 2018, pending Mr Tucker's availability, to further discuss ways in which we can progress the access issue such that all parties are comfortable and satisfied with the arrangements. MRCG adopted a 'good neighbour' policy and would always seek to come to an amicable agreement on any matters as this was always the best course of action if good relations and trust between the parties were to be established going forward.



Date	Stakeholder	Comments & Advice	Response
5 June 2018	DMIRS - Mr R Hepworth	<p>DMIRS requested additional information on:</p> <p>1) What clearing controls will be put in place during clearing to avoid any direct or indirect impacts to the [Proteaceae Dominated Kwongan Shrubland] TEC, including how ground truthing will be conducted?</p> <p>2) The proposed exploration activities are located within the dieback risk area. The DMIRAS note dieback hygiene practices were outlined in PoW Reg ID 70830. Can you please also confirm that clearing and exploration activities will not be undertaken in wet soil conditions?</p> <p>The proponent did advise in the resubmitted PoW that a dieback survey had been done but the report was still being finalised. However, the recommendations in the report would be implemented. Unfortunately, these recommendations haven't been included in the PoW documentation. It would be of value to know what site-specific recommendations were made.</p>	<p>ISPL responded to address the issues raised with the following information:</p> <ul style="list-style-type: none"> • Dieback – Attached a copy of the dieback assessment report. This assessment found no dieback within M74/245. It was noted that a significant proportion of the inspected area is uninterpretable due to the type of vegetation occurring. Dieback control measures proposed include: <ul style="list-style-type: none"> • Ensure all vehicles and machinery are clean upon arrival to site. This is particularly important for vehicles/machinery that have been working in other areas where dieback management may not be in place. • Soil movement from uninterpretable areas into uninfested areas is to be prevented. In wet conditions where soil adheres to vehicles and machinery, clean down will be required when entering uninfested areas from an uninterpretable area. • For operations undertaken during wet conditions, inspection/hygiene points, including washdown equipment will be required at the boundary between uninfested and uninterpretable areas. Vehicles should be inspected and washed down if necessary, before entering uninfested areas from uninterpretable areas. Inspection/washdown is not required when entering uninterpretable areas from uninfested areas. A Hygiene Management Plan would assist in identifying and outlining the necessary hygiene requirements. • Conduct operations under dry soil conditions. Where activities occur under dry soil conditions and soil does not adhere to vehicles and machinery, they may move from uninterpretable areas into uninfested areas without performing a cleandown. • Operational areas that are located within uninfested areas are required to be assessed every 12 months. Phytophthora Dieback occurrence information expires 12 months after the assessment completion date in operational areas and is no longer valid after this period. No further assessments are required for uninterpretable areas, as the status of these areas will not change. • TEC Management – Mapped TEC areas are being redefined and mapped following Woodman Environmental May field trip and a TEC and Significant Values Induction to be rolled out for Exploration staff. This induction will ensure that personnel involved in pegging new areas to be cleared are able to identify and avoid TEC vegetation. The induction is being developed by ISPL with Woodman Environmental's input.

References

- AMECO. (2017). *Munglinup Graphite Deposit Hydrogeological Assessment for Mine Water Supply*. Prepared for Gold Terrace Pty Ltd.
- BOM. (2020). *Climate statistics for Australian locations*. Retrieved from Bureau of Meteorology (BOM): http://www.bom.gov.au/climate/averages/tables/cw_012044.shtml
- Dixon, K. W., & Christenhysz, M. J. (2018). Flowering in darkness: A new species of subterranean orchid *Rhizanthella* (Orchidaceae: Orchidoideae: Diurideae) from Western Australia. *Phytotaxa*, 75-79.
- DoEE. (2014). *Approved Conservation Advice for Proteaceae Dominated Kwongkan Shrublands of the southeast coastal floristic province of Western Australia*. Canberra, ACT: Department of the Environment.
- Ecologia. (2015). *Munglinup Graphite Project Flora and Fauna Assessment*. Western Australia: Ecologia.
- Ecologia. (2015). *Munglinup Graphite Project Flora and Fauna Assessment*. Western Australia: Ecologia.
- EPA. (2016, December 13). *Environmental Factor Guideline – Flora and Vegetation*. Retrieved from Environmental Protection Authority: www.epa.wa.gov.au
- EPA. (2020). *Instructions on how to prepare Environmental Protection Act 1986 Part IV Environmental Management Plans*. Environmental Protection Authority.
- Gee, S. T. (1997). *Catchments of the Esperance region of Western Australia*. Perth, WA: Report 165. Department of Agriculture and Food.
- Johnson, S. L. (1998). *Hydrogeology of the Ravensthorpe 1:250 000 sheet: Hydrogeological Map Explanatory Notes Series*. Water and Rivers Commission.
- Luke, G. J., Burke, K. L., & O'Brien, T. M. (1988). *Evaporation Data for Western Australia. Technical Report No. 65*. Perth, WA: Western Australia Department of Agriculture.
- Luke, G. J., Burke, K. L., & O'Brien, T. M. (1988). *Evaporation Data for Western Australia. Technical Report No. 65*. Perth, WA: Western Australia Department of Agriculture.
- MRC Graphite Pty Ltd. (2018). *Munglinup Graphite Project - S38 & EPBC Referral: Supporting Information*.
- Rockwater. (2019). *Munglinup Graphite Project Stage 2 Hydrogeological Assessment*.
- Rockwater. (2019). *Munglinup Graphite Project Stage 2 Hydrogeological Assessment*.
- Rockwater. (2020). *Munglinup Graphite Project Hydrogeological Review*.
- Western Ecological. (2020 (b)). *Vertebrate Impact Assessment Memorandum – MRC Munglinup Graphite Project*.
- Woodman Environmental . (2018). *Peer Review of Consultant Report Level 2 Flora and Vegetation Assessment in the Munglinup Area*.

- Woodman Environmental. (2018(b)). *Munglinup Graphite Project Flora and Vegetation Assessment – Interim Report: Survey for TEC ‘Proteaceae Dominated Kwongkan Shrublands of the southeast coastal floristic province of WA’ & habitat for the Threatened taxon Rhizanthella johnstonii.*
- Woodman Environmental. (2018b). *Peer Review of Consultant Report, Level 2 Flora and Vegetation Assessment in the Munglinup Area.* Perth, WA: MRC Graphite Pty Ltd.
- Woodman Environmental. (2019). *Munglinup Graphite Project Flora and Vegetation Assessment.* Applecross, WA.
- Woodman Environmental. (2019). *Munglinup Graphite Project Flora and Vegetation Assessment.*
- Woodman Environmental. (2019(b)). *Munglinup Graphite Project - Desktop Review of Potential Regional Extent of Vegetation Units.*
- Woodman Environmental. (2020). *Munglinup Graphite Project Flora and Vegetation Assessment.*
- Woodman Environmental. (2020(b)). *Munglinup Graphite Project Flora and Vegetation Impact Assessment Memo.*



Appendix 1 – MRCG Flora and Vegetation Risk Assessment



Environmental Consequences Descriptions

Environmental Factor	Minor	Medium	Serious	Major	Catastrophic
	Limited damage to minimal area of low significance.	Minor effect on biology or physical environment.	Moderate short-term effects but not affecting eco-system.	Serious medium-term environmental effects.	Very serious long-term environmental impairment of eco-system.
Biodiversity / Flora / Fauna / Ecosystems.	<p>None or insignificant impact on ecosystem component (physical, chemical or biological) expected with no effect on ecosystem function.</p> <p>Impact does not require specific management or rehabilitation.</p>	<p>Moderate to minor impact to ecosystem component (physical, chemical or biological).</p> <p>Minor off-site impacts at a local scale.</p> <p>Damage is recoverable through short-term management and rehabilitation.</p>	<p>Minor and short-term impact to high value or sensitive ecosystem expected.</p> <p>Off-site impacts at a local scale.</p> <p>Rectification and rehabilitation over the medium-term.</p>	<p>Long-term impact to significant high value or sensitive ecosystem expected.</p> <p>Long-term impact on a wide scale.</p> <p>Adverse impact to a listed species expected.</p> <p>Rectification difficult but may be possible in the long-term.</p>	<p>Long-term impact to significant high value or sensitive ecosystem expected.</p> <p>Long-term impact on a wide scale.</p> <p>Adverse impact to a listed species expected.</p> <p>Rectification difficult and unlikely to result in recovery.</p>

Risk Consequence and Likelihood Definitions

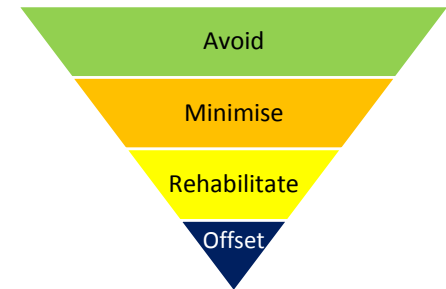
Consequence Ranking			Likelihood Ranking		
1	Minor	Limited damage to minimal area of low significance.	A	Almost Certain	The incident is expected to occur most of the time/every time.
2	Medium	Minor effect on biology or physical environment.	B	Likely	The incident will probably occur in most circumstances/ regularly/ weekly.
3	Serious	Moderate short-term effects but not affecting ecosystem.	C	Possible	The incident should occur at some time/ quarterly.
4	Major	Serious medium-term environmental effects.	D	Unlikely	The incident could occur at some time in the life of the project.
5	Catastrophic	Very serious long-term environmental impairment of ecosystems.	E	Rare	The incident may occur only in exceptional circumstances and may never happen.



Risk Assessment Categories

		Consequences				
		1	2	3	4	5
Likelihood		Minor	Medium	Serious	Major	Catastrophic
A	Almost Certain	Moderate 11	High 16	Extreme 20	Extreme 23	Extreme 25
B	Likely	Moderate 7	High 12	High 17	Extreme 21	Extreme 24
C	Possible	Low 4	Moderate 8	High 13	High 18	Extreme 22
D	Unlikely	Low 2	Low 5	Moderate 9	High 14	High 19
E	Rare	Low 1	Low 3	Low 6	Moderate 10	High 15

Hierarchy of Controls



Management Plan Risk Assessment – Flora and Vegetation

Management Objective	Inherent Risk	Management Actions	Residual Risk	Timeframe/Phase
Minimise the potential for clearing to cause significant damage, degradation or unlawful loss to the Proteaceae Dominated Kwongkan Shrubland TEC or other conservation significant flora.	HIGH 13	<ul style="list-style-type: none"> Implement an internal clearing permit procedure to avoid accidental clearing of the Proteaceae Dominated Kwongkan Shrubland TEC and other conservation significant flora. The indirect impact to <i>Leucopogon</i> aff. <i>canaliculatis</i>, <i>Synaphea</i> aff. <i>drummondii</i> and <i>Synaphea</i> sp. Jilakin Flat Rocks Rd (R. Butcher et. al RB200) will be limited to no more than nine individuals directly impacted. In minesite planning, prioritise locating infrastructure in existing disturbed areas to minimise disturbance to flora and vegetation. Where the Proteaceae Dominated Kwongkan Shrubland TEC has been recorded, the following actions will be undertaken: <ul style="list-style-type: none"> It will be avoided as far as practicable through clear survey and marking out. It will be incorporated into the mine plan. Its identification and management will be incorporated into the environmental education package. If areas containing the Kwongkan Shrubland TEC are cleared, the following actions will be undertaken to maximise rehabilitation: <ul style="list-style-type: none"> Vegetation will be stockpiled separately, and sign posted. Topsoil will be stockpiled and preserved for rehabilitation. Appropriate seed mix will be used to promote rehabilitation. 	MODERATE 9	All Phases



Management Objective	Inherent Risk	Management Actions	Residual Risk	Timeframe/Phase
Avoid the clearing or unlawful clearing of <i>R. johnstonii</i> habitat	HIGH 18	<ul style="list-style-type: none"> Where <i>R. johnstonii</i> habitat has been identified the following actions will be undertaken: <ul style="list-style-type: none"> It will be avoided as far as practicable The area will have signage erected If <i>R. johnstonii</i> habitat is cleared, the following will be undertaken: <ul style="list-style-type: none"> Vegetation will be stockpiled separately, and sign posted. Topsoil will be stockpiled and preserved for rehabilitation. 	MODERATE 10	All Phases
Minimise the introduction of invasive weed species through the Project area.	MODERATE 8	<ul style="list-style-type: none"> Implement a Vehicle Hygiene Procedure which includes requirements for vehicles to be washed down prior to deployment to site, washdown bays on site, frequent use of washdown. Implementation of invasive species control, if deemed necessary. Provide education and training to employees on weed management. 	LOW 5	All Phases
No introduction of <i>Phytophthora cinnamomi</i> Dieback to the Project area.	HIGH 13	<ul style="list-style-type: none"> Development and implementation of a Dieback Management Plan. Use of Dieback washdown stations for all vehicles and machinery entering and leaving the site. Maintenance of Dieback washdown stations. Provide education and training to employees of Dieback and the use of washdown stations. 	MODERATE 9	All Phases
Minimise dust emissions across the Project area.	HIGH 12	<ul style="list-style-type: none"> Dust will be reduced on site through stabilisation of topsoil stockpiles, implementation of speed limits on unsealed roads, and application of dust suppression methods along roads and on stockpiles. Conveyors will incorporate dust control strategies to minimise dust. Watercarts or fixed spray sprinklers will be implemented to minimise dust off ROM Pad and stockpiles. 	LOW 5	Operations
Minimise the risk to flora and vegetation from unauthorised off-road driving.	HIGH 17	<ul style="list-style-type: none"> Avoid accidental disturbance to conservation significant flora by enforcing strict traffic management rules such as: <ul style="list-style-type: none"> Keeping to designated tracks. Reduced speed limits. Prohibiting access to native vegetation areas except for monitoring purposes. Signed no-go areas on certain areas. 	MODERATE 9	All Phases



Management Objective	Inherent Risk	Management Actions	Residual Risk	Timeframe/Phase
Minimise clearing which could cause fragmentation.	HIGH 13	<ul style="list-style-type: none"> • Design infrastructure and site layout to avoid listed threatened species, vegetation and the Kwongkan Shrubland TEC. • Design site layout to create vegetation corridors. • Develop and implement an internal clearing permit procedure (to include flagging of clearing areas, supervision of clearing by suitably qualified environmental professional, reporting of unauthorised clearing). • Undertake progressive land clearing with the amount of active disturbance minimised. • Undertake progressive rehabilitation in accordance with the site Mine Closure Plan. • Where possible, direct placement of topsoil and vegetation will be respread over rehabilitated areas. 	LOW 6	All Phases
No increase in fire frequency or intensity.	HIGH 18	<ul style="list-style-type: none"> • Undertake regular maintenance of fire breaks and implement fire management procedures (e.g. Hot Work Permit system, firefighting training, Emergency Response Plan) to avoid increases in fire frequency. • Install firefighting equipment on site infrastructures and in all vehicles. • Install lightning protection system as part of Project design where necessary. • Vehicles are not permitted to leave access tracks or cleared areas except authorised vehicles only. • MRCG will work with DFES and DBCA to undertake prescribed burns if deemed necessary. • Undertake staff training and awareness programs to provide information on the prevention and management of fires. 	MODERATE 10	All Phases