Mount Marion Lithium Project

Access Road Widening

Supporting document for a native vegetation clearing permit application

5 October 2022

Revision 1

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TABLE OF CONTENTS

EXECUTIVE SUMMARY 2

1. INTRODUCTION 5

2. PURPOSE AND METHODOLOGY 6

3. PROJECT DESCRIPTION 9
   - 3.1 Regional setting 9
   - 3.2 survey and proposed clearing area 9
   - 3.3 Tenure and land access 9
   - 3.4 Proximity to DBCA managed lands 9
   - 3.5 Historical and future land use 10

4. ENVIRONMENTAL SETTING 11
   - 4.1 Climate 11
   - 4.2 Underlying geology 11
   - 4.3 Soils and soil landscapes 11
   - 4.4 Surface water 14
   - 4.5 Groundwater 14
   - 4.6 Land degradation 14

5. FLORA AND VEGETATION 15
   - 5.1 Desktop assessment 15
   - 5.2 Field survey 17
     - 5.2.1 Reconnaissance Flora and Vegetation Assessment (Ecologia, 2022) 19
     - 5.2.2 Detailed Flora and Vegetation Assessment (NVS, 2016) 21
   - 5.3 Vegetation communities and condition 23

6. FAUNA AND HABITAT 28
   - 6.1 Fauna Habitat 31
   - 6.2 Fauna 31
   - 6.3 Survey area 32

7. AVOIDANCE AND MITIGATION 34

8. ASSESSMENT AGAINST THE TEN CLEARING PRINCIPLES 35

9. REFERENCES 41

10. GLOSSARY 43

11. ABBREVIATIONS 44

APPENDICES 45

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Figures

Figure 2-1 Project Location and Reserve Areas....7
Figure 2-2:Proposed Clearing Area....8
Figure 4-1: Monthly maximum and minimum temperatures, rainfall and windspeed (BoM, 2022)....11
Figure 4-2: Soils Landscape Systems....13
Figure 5-1: Supporting Biological Surveys....18
Figure 5-2 Ecologia (2022) Field Vegetation Units and Sample Sites....20
Figure 5-3 NVS (2016) Field Vegetation Units and Sample Sites....22
Figure 5-4 Vegetation Condition Ecologia (2022)....27
Figure 5-5 Vegetation Condition NVS (2016)....27
Figure 6-1 Fauna Surveys – Bamfords 2022, 2020 and 2019....30

Tables

Table 3-1 Land tenure....9
Table 4-1Soil Landscape Map Descriptions (DPIRD, 2022b)....12
Table 5-1 Pre-European vegetation associations mapped with the survey area (Ecologia, 2022)....17
Table 5-2 Extent of Vegetation Communities that Intersect with the Proposed Clearing Area (Ecologia, 2022 and NVS, 2016)....24
Table 6-1 Fauna assessments relevant to the proposed clearing area....29
Table 6-2 Conservation significant taxa....33
Table 7-1 Mt Marion environmental management plan (MRL, 2019)....34
Table 8-1 Identified Impacts against Clearing Principles....36

Appendices

Appendix A Reconnaissance Flora and Vegetation Assessment (Ecologia, 2022)
Appendix B Level 1 Flora and Vegetation Survey for the Mt Marion Project Area (NVS, 2016)
Appendix C Basic and Targeted Fauna Assessment (Bamford Consulting Ecologists, 2022)
Appendix D Malleefowl Survey (Bamford Consulting Ecologists, 2020)
Appendix E Review of Fauna Assessments covering the Mt Marion Lithium Project Lease Area (Bamford Consulting Ecologists, 2019)
Appendix F Proof of Lease and Ownership L15/360

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EXECUTIVE SUMMARY

Mineral Resources Limited (MRL) operates the Mount (Mt) Marion Lithium Mine approximately 36 kilometres (km) south of Kalgoorlie in the Eastern Goldfields region, Western Australia (WA) (Figure 1). MRL is proposing to upgrade the main access road (L15/360) to the Mt Marion mine site in order to provide a safer and improved access.

This application supports the clearing of a total of 6.9348 hectares (ha) of native vegetation, surrounding the existing portion of the main access road, which is approved for clearing under CPS 8632 (Figure 2). The clearing of this additional vegetation will enable necessary upgrades to the main access road for the Mt Marion Lithium Project (the Project).

The proposed clearing permit area excludes any formal waterbodies and conservation reserves. The nearest water bodies are located approximately 20km to the north (Lake Douglas, Lake Red and Lake Brown), and approximately 30km to the southeast (Lake Lefroy) of the proposed clearing area. The Yallari Timber Reserve is located immediately adjacent and to the west of the proposed clearing area, and the Karramindie Forest located 8 km to the north (Figure 1).

Supporting biological surveys completed to support this application, include a Reconnaissance Flora and Vegetation Assessment (Ecologia, 2022) (Appendix A); Level 1 Flora and Vegetation Survey for the Mt Marion Project Area (NVS, 2016) (Appendix B); a Basic and Targeted Fauna Assessment (Bamford Consulting Ecologists, 2022) (Appendix C); Malleefowl Survey (Bamford Consulting Ecologists, 2020) (Appendix D); and Review of Fauna Assessments covering the Mt Marion Lithium Project Lease Area (Bamford Consulting Ecologists, 2019) (Appendix E). Figure 5 illustrates the extent of the various surveys that support this application. For the purposes of this supporting document, the relevant information in these surveys that relate to the proposed clearing permit area will be referenced to.

A Reconnaissance Flora and Vegetation Assessment was completed by Ecologia on 20 October to 23 October 2021 (Appendix A). The survey was completed to cover tenement E15/1599 to the west of the Mt Marion operation, which incorporates part (62.59%) of the proposed clearing application area (Figure 2).

173 species were recorded in 69 vegetation sites. 29 native species were recorded in the three quadrats (VD27, VD28 and VD30) in the closest proximity to the proposed clearing area (Figure 6). Although Priority species *Acacia websteri* (P1) and *Eremophila acutifolia* (P3) was recorded in the survey area, the species was not identified in the proposed clearing area.

A Detailed (formerly Level 1) Flora and Vegetation Assessment was completed by NVS over nine days, in 2013 to 2015 (Appendix B). The survey was completed to cover the entire Mt Marion project area (Location Lease 53, M15/717, M15/999, M15/1000, E15/972, E15/1190, L15/220 and L15/353) and incorporates the proposed clearing for the access road (L15/360) (Figure 2 and Figure 5).

The vegetation in the NVS survey (2016) was assessed as being mostly in Very Good condition using the scale of Keighery (Keighery, 1994); in comparison to the Ecologia survey (2022) which assessed the vegetation as being mostly in Excellent condition, in accordance with the EPA (2016) vegetation condition scale.

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23 vegetation groups were identified during the NVS survey (2016), with six of these identified within the proposed clearing area, compared to seven vegetation groups identified during the Ecologia survey (2022), with four of these identified within the proposed clearing area. There were no National, State, Regional, or Local significant vegetation types identified in proximity to the proposed clearing area (Ecologia, 2022).

186 species were recorded in the NVS survey (2016) with 173 species associated with the corresponding vegetation types (a, b, c, f, h, u, v) which are located across the proposed clearing area (Figure 7). The Priority species *Diocirea acutifolia* (P3) was identified in 28 locations within the survey area, including a population located adjacent to the proposed clearing area. The population of this species is however widespread in the region and will not result in changes to the conservation coding or overall populations of this species (NVS, 2016).

There are no EPBC Act (1999) or BC Act (2016) listed Threatened species recorded in either flora assessment (NVS, 2016 and Ecologia, 2022). Three introduced species were recorded in the Ecologia survey (2022) and five in the NVS survey (2016), none of which are listed as a Declared Pest.

Desktop assessments completed in both flora and vegetation surveys, indicate that Pre-European vegetation associations (Beard, 1990) present in the proposed clearing area are well above the 30% threshold at a state, bioregional and subregional level (NVS, 2016) and (Ecologia, 2022).

There were no Threatened or Priority Ecological Communities recorded in the survey area or identified in the PEC/TEC desktop search for either flora survey (NVS, 2016) and (Ecologia, 2022).

A Basic and Targeted Fauna Assessment (desktop assessment and targeted survey for conservation significant species) was completed by Bamford Consulting Ecologists (BCE) on 10 – 14 ^{h} September 2021 for the [redacted]L15/353, M15/999 and E15/599 and incorporates the proposed clearing application area for the access road (L15/360) (Figure 2 and Figure 5) (Appendix C). The assessment included the identification of fauna habitat; opportunistic fauna observations; records of bird encounters; and targeted searches for Malleefowl, Chuditch, Arid Bronze Azure Butterfly (associated with *Camponotus* ants) and Trapdoor spiders.

Seven fauna habitat types (or Vegetation and Substrate Associations (VSAs) were identified in the project area with all VSAs considered important for fauna, with five VSAs relevant to main access road L15/360, mostly dominated by Open to closed Eucalypt woodland or Mallee over mixed shrubland on flats.

The faunal assemblage expected is typical of the Coolgardie region with desktop assessments identifying 288 vertebrate fauna species as potentially occurring in the Mt Marion Lithium Project area, with 95 of these been recorded in previous assessments. Field investigations confirmed the presence of three reptiles, 34 birds, two native mammals and one introduced mammal with three reptile, nine bird and three mammal species detected in the camera trap survey. There were no conservation significant species were recorded near the proposed clearing area of the main access road (BCE, 2022).

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A Malleefowl Survey was completed by Bamford Consulting Ecologists (BCE) on 6 – 8 January 2020 to identify Malleefowl mounds and critical habitat, whilst satisfying Condition 10 of the Clearing Permit CPS 8632/1. The survey area included a smaller area of interest, within the proposed clearing application area for the access road (L15/360) (Figure 2 and Figure 5) (Appendix D). No active or recently used Malleefowl nest mounds or presence of malleefowl were identified during this survey, nor was there any identified critical habitat within the survey area (BCE, 2020).

A Review of Fauna Assessments was completed by Bamford Consulting Ecologists (BCE) in July 2019 for tenements covering the Mt Marion Lithium Project Lease Area and including the proposed clearing application area for the access road (L15/360) (Figure 2 and Figure 5) (Appendix E). The assessment included was primarily based on fauna assessments that have been conducted across the Mt Marion Lithium Project area since 2010 (BCE, 2019).

Based on a desktop assessment and the findings of the previous fauna assessments, 289 vertebrate fauna species were identified as potentially occurring in the Mt Marion Lithium Project area, with 85 species recorded from the project area (BCE, 2019). This was updated in the 2022 BCE survey (to 95 species recorded in previous assessments (Appendix C).

The fauna assemblage was identified as largely intact and rich (missing some medium-sized mammals in common with much of WA), and broadly typical of the Coolgardie Bioregion. Some south-western species occur at the eastern edge of their range (Blue-breasted Fairy-wren, Western Yellow Robin) and the assemblage also has elements from adjacent biogeographic zones (BCE, 2019).

Although 20 significant species were identified to be considered likely to occur as either residents of the survey area, or at least as regular visitors in this assessment (BCE, 2019), more recent surveys have yet to locate these species in the project area (BCE, 2022).

In accordance with the *Native Vegetation Clearing Regulations 2004* (WA), an assessment of the proposed clearing has been completed against the Ten Clearing Principles and is included as part of this report. This assessment concluded that the clearing of approximately 7 ha of native vegetation within the proposed clearing area (L15/360) is not at variance with Principles (A) to (J).

In summary, the environmental impacts of the proposal involving the clearing of native vegetation can be adequately managed by MRL's Mt Marion Lithium Mine Environmental Management System. Furthermore, MRL has the environmental management resources to adequately facilitate this.

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1. INTRODUCTION

The Mt Marion Lithium Mine is located 40 km southwest of Kalgoorlie (MRL, 2021). Process Minerals International Pty Ltd (PMI) operates the Mt Marion Lithium Project (the Project). PMI is a 100% subsidiary of Mineral Resources Limited (MRL), who holds an exclusive Life of Mine (LOM) Mining Services Agreement (MSA) with Reed Industrial Minerals Pty Ltd (RIM). In March 2021, Westgold Resources (Westgold) sold its lithium assets including a royalty over the Mt Marion Lithium Mine, the exploration and developing rights on adjoining land tenure to Reed Industrial Minerals (RIM) (Westgold, 2021). Pursuant to the MSA, MRL designed and built, and now operates, the Project through joint venture company RIM, with PMI (50%) and Gangfeng Lithium Co. Ltd (50%).

MRL is proposing to upgrade the main access road to the Mt Marion mine site to provide a safer and improved access; and to support anticipated increased traffic expected as a direct result of expansions to both the Project's camp site and production capacity. The upgrade will involve widening and bituminising of the main access road, facilitated by the clearing of 6.9348 hectares (ha) of native vegetation in the existing shoulders of the main access road. This proposed clearing area is immediately adjacent to the existing portion of the main access road within L15/360, which is currently authorised for clearing under CPS 8632/1 (Figure 2).

Recent environmental approvals that support an increased production capacity at the Project, include a Part V Licence amendment L9037/2017/1 (July 2022) and Mining Proposal REGID101822, (August 2022), with the Department of Water and Environmental Regulation (DWER); and Department of Mines, Industry Regulation & Safety (DMIRS), respectively.

This report comprises of the supporting documentation required for the Native Vegetation Clearing Permit application to clear 6.9348 hectares (ha) of native vegetation.

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2. PURPOSE AND METHODOLOGY

The purpose of this document is to support a purpose permit application for the clearing of 6.9348 ha of native vegetation, adjacent to the main access road in L15/360 (Figure 2). The area excludes conservation estate or sites registered under the *Aboriginal Heritage Act 1972*.

Methodology employed for this assessment include an assessment of the proposed clearing area against the *Native Vegetation Clearing Regulations 2004* (WA) Clearing Principles (Section 8), considering the key surrounding environmental characteristics and analysis of the relevant supporting biological surveys.

Supporting biological surveys completed to support this application include:

1. Appendix A - Reconnaissance Flora and Vegetation Assessment (Ecologia, 2022)
2. Appendix B - Level 1 Flora and Vegetation Survey for the Mt Marion Project Area (NVS, 2016)
3. Appendix C - Basic and Targeted Fauna Assessment (Bamford Consulting Ecologists, 2022)
4. Appendix D - Malleefowl Survey (Bamford Consulting Ecologists, 2020)
5. Appendix E - Review of Fauna Assessments covering the Mt Marion Lithium Project Lease Area (Bamford Consulting Ecologists, 2019).

Figure 5 illustrates the extent of the various surveys that support this application. For the purposes of this supporting document, the relevant information in these surveys that relate to the proposed clearing permit area, will be referred to as the “main access road”.

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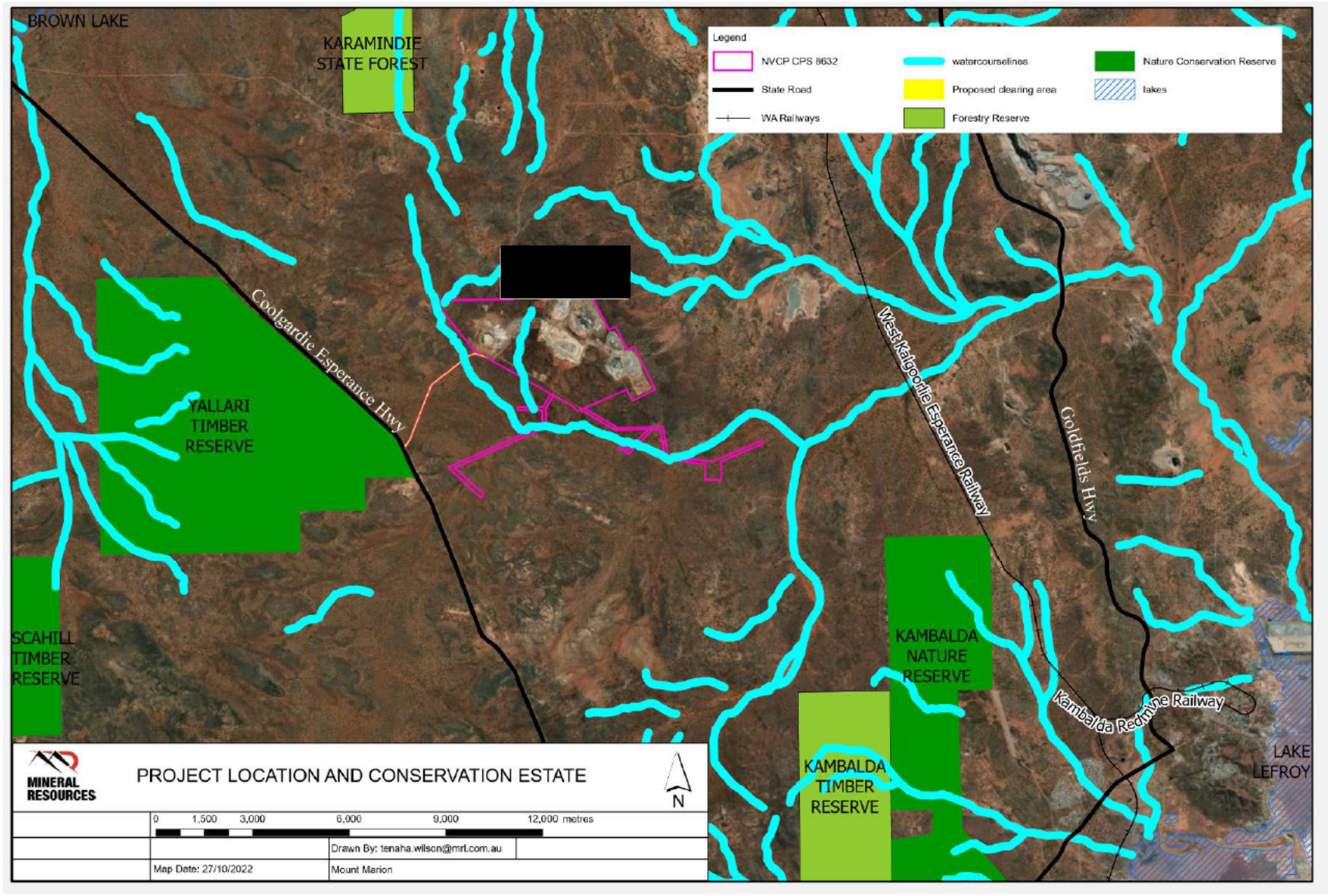

Figure 2-1 Project Location and Reserve Areas

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Figure 2-2:Proposed Clearing Area

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3. PROJECT DESCRIPTION

3.1 REGIONAL SETTING

The main access road to the Mt Marion operation (the "project") is located within the Coolgardie Bioregion and Eastern Goldfields Subregion (COO03) of the Interim Biogeographic Regionalisation of Australia (IBRA) region (BCE, 2022). The Eastern Goldfields subregion is characterised by undulating plains, greenstone ridges, playa lakes, and scattered exposed bedrock. The subregion lies on the Yilgarn Craton's Eastern Goldfields Terrain and comprises of gently undulating plains interrupted in the west by Archaean greenstone ridges and low hills, while the east contains a horst of Proterozoic granulite. In the western half there are a series of large playa lakes which are remnants of an ancient major drainage line. The dominant soil type is Calcareous earth, which cover most of the plains and greenstone areas (CALM, 2002).

The Eastern Goldfields subregion is dominated by Mallees, Acacia thickets and shrub heaths on sandplains. Diverse Eucalyptus woodlands occur around salt lakes, on ranges, and in valleys and dwarf shrublands of samphire are common in salt areas (NVS, 2022).

3.2 SURVEY AND PROPOSED CLEARING AREA

The proposed clearing area is 6.9348 hectares and located immediately adjacent to the main access road to the Mt Marion operation, as illustrated in Figure 3.

The relevant locations of the supporting biological surveys are illustrated in Figure 5.

3.3 TENURE AND LAND ACCESS

Access to the site is via the Coolgardie-Esperance Highway (Figure 2).

A copy of the relevant lease information for L15/360 is attached as Appendix F. Details of the relevant land tenure is provided in Table 3-1.

Table 3-1 Land tenure

Property	Polygon Identification No. (PIN)	Certificate of Title	Ownership
L15/360	Lot on Plan LPL N050022	Deposited Plan 220400	Reed Industrial Minerals Pty Ltd

The proposed clearing area lies within tenement L15/360, which is the main access road to the Mt Marion operation, as illustrated in Figure 2-2.

The property is zoned as Rural under the Shire of Coolgardie Local Planning Scheme.

3.4 PROXIMITY TO DBCA MANAGED LANDS

There are no Department of Biodiversity, Conservation and Attractions (DBCA) managed lands in the proposed clearing area, however, Yallari Timber Reserve is located directly adjacent to the west of the main access road. There are four additional DBCA managed lands located beyond the boundary of L15/360, including Kangaroo Hills Timber Reserve, Scahill Timber Reserve, Kambalda Timber and Kambalda Nature Reserve (Figure 2-1).

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3.5 HISTORICAL AND FUTURE LAND USE

The dominant land use within the Eastern Goldfield subregion is grazing, with smaller areas of crown reserves, mining, freehold, and conservation (BCE, 2022) with 4.35 % of the sub-region vested within conservation reserves (Cowan, 2001). Cowan (2001) describes the Goldfields Woodlands as having an exceptionally high diversity of Eucalyptus species with as many as 170 species occurring in the bioregion. The project area lies within the Coolgardie Vegetation System. All woodlands in the Coolgardie System have been logged in the past for mining timber and firewood and current vegetation is secondary growth regenerated from seed and coppice (Beard, 1972).

Although the vegetation in the survey area has been subjected to historic exploration activities and grazing, Ecologia (2022) and NVS (2016) observed minimal disturbance within the survey areas, with the vegetation assessed as being mostly in Excellent condition, in accordance with the EPA (2016) vegetation condition scale (Ecologia, 2022) and Very Good (NVS, 2016).

As mentioned, MRL intends to clear within the proposed area to upgrade and maintain the main access road.

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4. ENVIRONMENTAL SETTING

The environmental setting for L15/360 is discussed in Sections 4.1 to 4.10 below.

4.1 CLIMATE

The region is characterised by hot summers and cold winters with low rainfall distributed throughout the year (approximately 270 millimetres (mm) per year) (BoM, 2021). The closest and most complete climate statistical data was obtained from Kalgoorlie Boulder Airport, Station Number 012038, (BoM, 2021) (Figure 4-1).

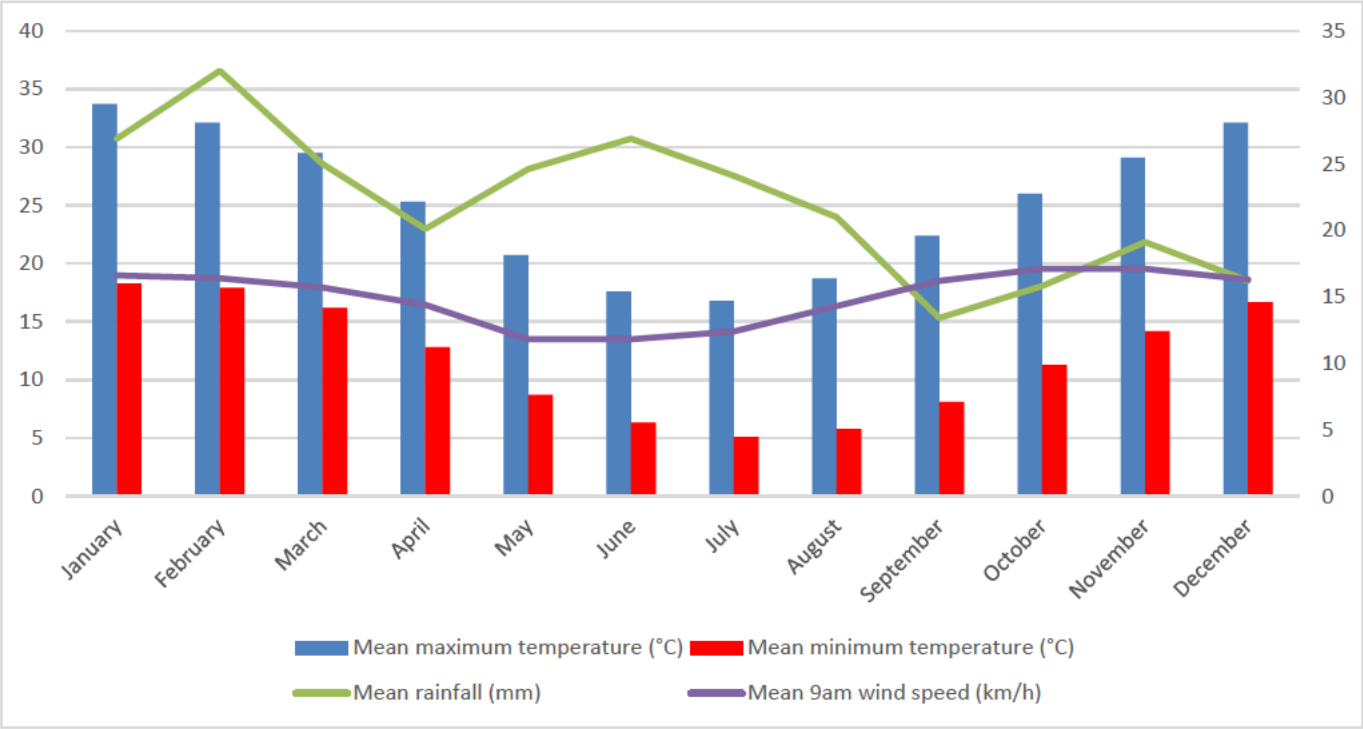

Figure 4-1: Monthly maximum and minimum temperatures, rainfall and windspeed (BoM, 2022)

4.2 UNDERLYING GEOLOGY

The underlying geology of the subregion is gneiss and granites that have eroded into a flat plane covered by tertiary soils and with scattered exposed bedrock. Calcareous earths are the dominant soil group and cover much of the plains and greenstone areas (Cowan, 2001).

The vegetation associated with this underlying geology typically consists of Mallees, Acacia thickets and shrub heaths on sandplains. Diverse Eucalyptus woodlands occur around salt lakes, on ranges, and in valleys. Salt lakes support dwarf shrublands of samphire. Woodlands and *Dodonaea* shrubland are known to occur on basic granulites of the Fraser Range some distance to the southeast of the survey area (CALM, 2002).

4.3 SOILS AND SOIL LANDSCAPES

The project is located across the Kambalda and Norseman Zones in the Kalgoorlie Province soil landscape region of the Department of Industries and Regional Development (DPIRD) system, which has been described at the regional level as undulating plains (with some sandplains, hills and salt lakes) on the

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granitic rocks and greenstone of the Yilgarn Craton (Tille, 2006). DPIRD Soil landscape mapping identified seven soil landscape types in the permit area (Figure 4-3 and Table 4-1).

Table 4-1Soil Landscape Map Descriptions (DPIRD, 2022b)

Soil Landscape Zone	Soil Landscape System	Map Unit Name	Description
265 Kambalda Zone	265k7	Mx41	Flat to undulating pediments marginal to unit AC1; granitic rock outcrop; some low escarpments
266 Norseman Zone	266k7	Mx41	Flat to undulating pediments marginal to unit AC1; granitic rock outcrop; some low escarpments

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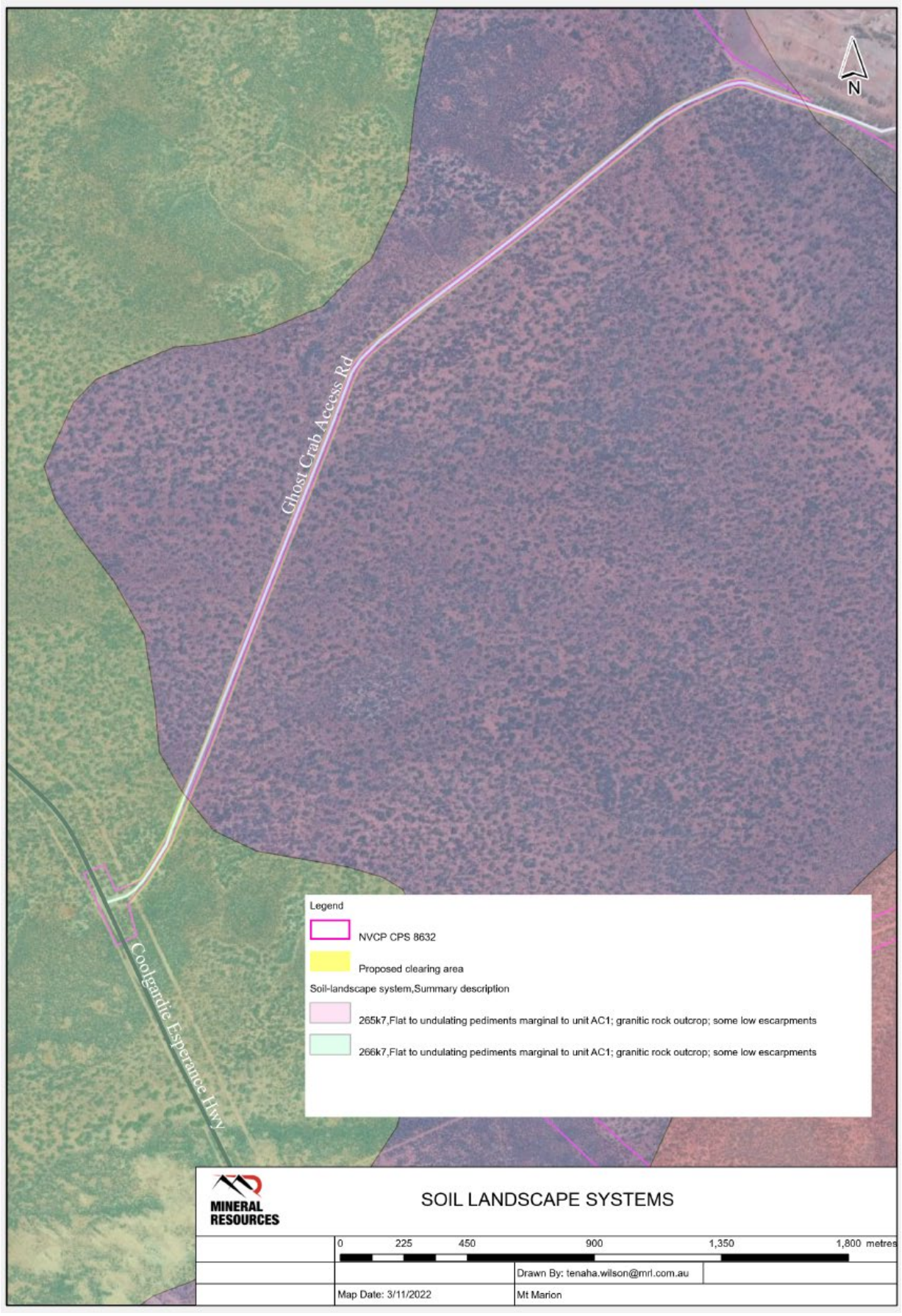

Figure 4-2: Soils Landscape Systems

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4.4 SURFACE WATER

The permit area is located within the Lake Lefroy Catchment (Lefroy Dundas Sub Area) (Clarke, 1991). Lake Lefroy is a shallow lake located approximately 26 km southeast of L15/360. The lake is poorly developed and typically dry, requiring intense rainfall to fill (EMM, 2019). The nature of the local climate (dominated by low rainfall and high evaporation rates) combined with the scale of the local surface water systems, results in highly ephemeral and flashy surface water responses only occurring after significant rainfall events. Based on historic surface water responses to local playa and lake systems, surface runoff events in these environments are unlikely to be observed on a seasonal basis and likely occur once every two to five years (AQ2, 2021).

The nearest water bodies are located over 20km to the north of the proposed clearing area (Lake Douglas, Lake Red and Lake Brown).

4.5 GROUNDWATER

L15/360 is located within the Goldfields Groundwater Area and includes shallow ephemeral lakes or unconfined aquifers that are saline or hypersaline. The Mt Marion Lithium Mine has recorded groundwater quality with a pH of 6.4 and with Total Dissolved Solids (TDS) concentrations of 30,000 milligrams per litre (mg/L) to 40,000 mg/L. Deeper regional aquifers in the area host hypersaline water quality, typically of 140,000 mg/L TDS (Aquaterra, 2008). Groundwater is typically 50 m below ground level.

4.6 LAND DEGRADATION

Land degradation can result from multiple processes including soil erosion, salinity, nutrient export, acidification, waterlogging, and flooding. Land degradation risk analysis within the proposal area using publicly available data was not possible due to the absence of acidity, salinity, erosion, waterlogging and flood risk data in this area. The Australian Soil Resource Information System indicates that the survey area has “No Known Occurrence” of acid sulphate soils (GHD, 2018).

An assessment of the project’s risk on land degradation has considered the landscape units which are Kambalda (265) and Norseman (266) (DPIRD, 2022b). Description of these landscape units, with the topographical and lithological features, are listed in Table 4-1. Both areas have similar topography with variations in calcareous loamy earths which when extensively cleared and left unrehabilitated are prone to erosion. The area is arid, and unlikely to flood or become waterlogged with minor ephemeral water courses recorded in vegetation surveys by GHD (2018). The risk by land degradation processes by this proposal is low.

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5. Flora and Vegetation

The flora and vegetation surrounding L15/360 was assessed by Ecologia (2022) and Native Vegetation Solutions (2016) and is referred to in Sections 5.1 to 5.2, below and included as Appendix A and B, respectively.

The surveys were completed to cover various projects relevant to the Mt Marion operation. For the purposes of this supporting document, only the information relating to the proposed clearing area (6.9348 ha) will be referred to in this document.

5.1 DESKTOP ASSESSMENT

Prior to the flora field surveys, both Ecologia (2022) and NVS (2016) completed a preliminary desktop assessment of the survey area to identify potential conservation matters that would need to be considered as part of future environmental approvals. The preliminary desktop assessments included a review of various regulatory databases including the EPBC Protected Matters Search Tool and DBCA database, as well an assessment against the extent and status of the pre-European vegetation (Beard).

The EPBC Protected Matters Search Tool indicated no *Environmental Protection Biodiversity Conservation Act 1999* (Cwth) or *Biodiversity Conservation Act 2016* (WA) listed Threatened Ecological Communities (TECs) and no Priority Ecological Communities (PECs) occur within the study area (Ecologia, 2022). Although the EPBC Protected Matters report indicated no Commonwealth Reserves within a 1km buffer region of survey area, the search did reveal that the Yallari Timber Reserve is within or nearby the 1km buffer zone of the search area (NVS, 2016). Yallari Timber Reserve is located on the western side of the Coolgardie-Esperance Highway reserved under the *Land Administration Act 1997* and vested in the Conservation and Parks Commission of WA, for the purpose of Timber Production. The Reserve is managed by DBCA as a Class C reserve, for the conservation of flora and fauna (Ecologia, 2022).

Ecologia's (2022) desktop assessment of NatureMap demonstrated that a total of 745 vascular plant taxa (including species, infraspecific taxa, and phrase name taxa), from 73 families and 282 genera, have been recorded from the vicinity of the survey area in tenement E15/1599. The most diverse families recorded being Myrtaceae (100 taxa), Fabaceae (97 taxa), Asteraceae (83 taxa), and Chenopodiaceae (70 taxa), whilst the most diverse genera are *Acacia* (53), *Eucalyptus* (50), *Eremophila* (35), *Maireana* (19), and *Grevillea* (18) (DBCA 2007 – current).

The DBCA database searches revealed three Threatened and 67 Priority Flora species occur within a 40km radius of the survey area in the NVS assessment (2016) (DPaW, 2015a); with the more recent database searches of the Threatened Priority Flora List (TPFL) and West Australian Herbarium (WAHERB) by Ecologia (2022), indicating 66 significant plant taxa within the desktop study area, including two Threatened taxa, 23 Priority 1 taxa, 11 Priority 2 taxa, 25 Priority 3 taxa, and five Priority 4 taxon.

The NVS (2016) assessment of the relevant database searches revealed that whist these taxa are considered to have the potential to occur within the survey area, based on their proximity and similar habitat, none of these known locations occur within the survey area, while the closest location occurs approximately 1.09km away from the south-eastern section of the survey area (DPaW, 2015a); and

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therefore further removed and several kilometres away from the proposed clearing area within the main access road L15/360.

More recently, Ecologia's desktop assessment (2022) revealed similar results with the likelihood of each taxon occurring within the survey area assessed based on the proximity of previous records and the potential presence of suitable habitat. This assessment indicated that 49 taxa potentially occur within the survey area ('likely' and 'possible' ratings); with 17 taxa considered unlikely to occur due to the probable absence of suitable habitat within the survey area or because they are known to have very restricted distributions and have not been recorded in the vicinity of the survey area.

The EPBC Protected Matters search tool revealed that the survey area could possibly be suitable habitat for Endangered Plant species *Gastrolobium graniticum* (Granite Poison), which is generally restricted to granite outcrops (NVS, 2016). This species is now listed as Threatened under the *BC Act 2016* (DBCA, 2022). Although there are 12 records of this species occurring within 50km of the survey areas, the latest record occurred in 2017 (Ecologia, 2022) and the species was not recorded during either field survey (Ecologia, 2022 and NVS, 2016).

The EPBC Protected Matters search tool in both surveys revealed that the areas could possibly be suitable habitat for the invasive weed species *Carrichtera annua* (Ward's Weed) (DAWE, 2021). *C. annua* was introduced into Australia from the eastern Mediterranean, and is now widespread throughout South Australia, the Interior, and Western Australia (Lamp & Collet, 1999). This species is currently not listed as a declared plant (DPIRD, 2022a) and as not recorded in either survey (Ecologia, 2022 and NVS, 2016).

The proposed clearing area does not lie within or contain any ESA's or Conservation Reserves or water bodies (DWER, 2021).

An assessment of pre-European vegetation units (Beard, 1990) was compiled through both desktop assessments and site visits (Ecologia, 2022 and NVS, 2016). More recently, the Ecologia assessment (2022) identified five vegetation units present, with the extent of all survey vegetation units being well above the 30% threshold at a State, bioregional, subregional and Shire level (> 90%). A summary of Pre-European and current extent of Beard vegetation types is provided in Section 3.1.4 of the NVS flora survey (Appendix A) and Section 3.3.1 of the Ecologia assessment (Appendix B). Table 5-1 demonstrates the percentage of Pre-European vegetation extent within the survey area and remaining and protected within the IBRA region.

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Table 5-1 Pre-European vegetation associations mapped with the survey area (Ecologia, 2022)

Vegetation Association	Description	% remaining within IBRA region	Current % protected for conservation in Coolgardie IBRA region	% in survey area (ha)
9	Medium woodland; coral gum (*Eucalyptus torquata*) & Goldfields blackbutt (*Eucalyptus lesouefii*)	97.8	1.5	7.1%
128	Bare areas and rock outcrops	99.6	11.7	23.6%
522	Medium woodland; redwood (*Eucalyptus transcontinentalis*) & merrit (E. floctoniae)	99.9	4.4	23%
936	Medium woodland; salmon gum	99.6	1.2	34.3%
1413	Shrublands; *Acacia, Casuarina* & *Melaleuca* thicket	98.2	16.8	12%

5.2 FIELD SURVEY

A mentioned in Section 2, the relevant biological surveys include:

1. Appendix A - Reconnaissance Flora and Vegetation Assessment (Ecologia, 2022)
2. Appendix B - Level 1 Flora and Vegetation Survey for the Mt Marion Project Area (NVS, 2016)
3. Appendix C - Basic and Targeted Fauna Assessment (Bamford Consulting Ecologists, 2022)
4. Appendix D - Malleefowl Survey (Bamford Consulting Ecologists, 2020)
5. Appendix E - Review of Fauna Assessments covering the Mt Marion Lithium Project Lease Area (Bamford Consulting Ecologists, 2019).

Further details of these surveys are provided below and illustrated in Figure 5-2.

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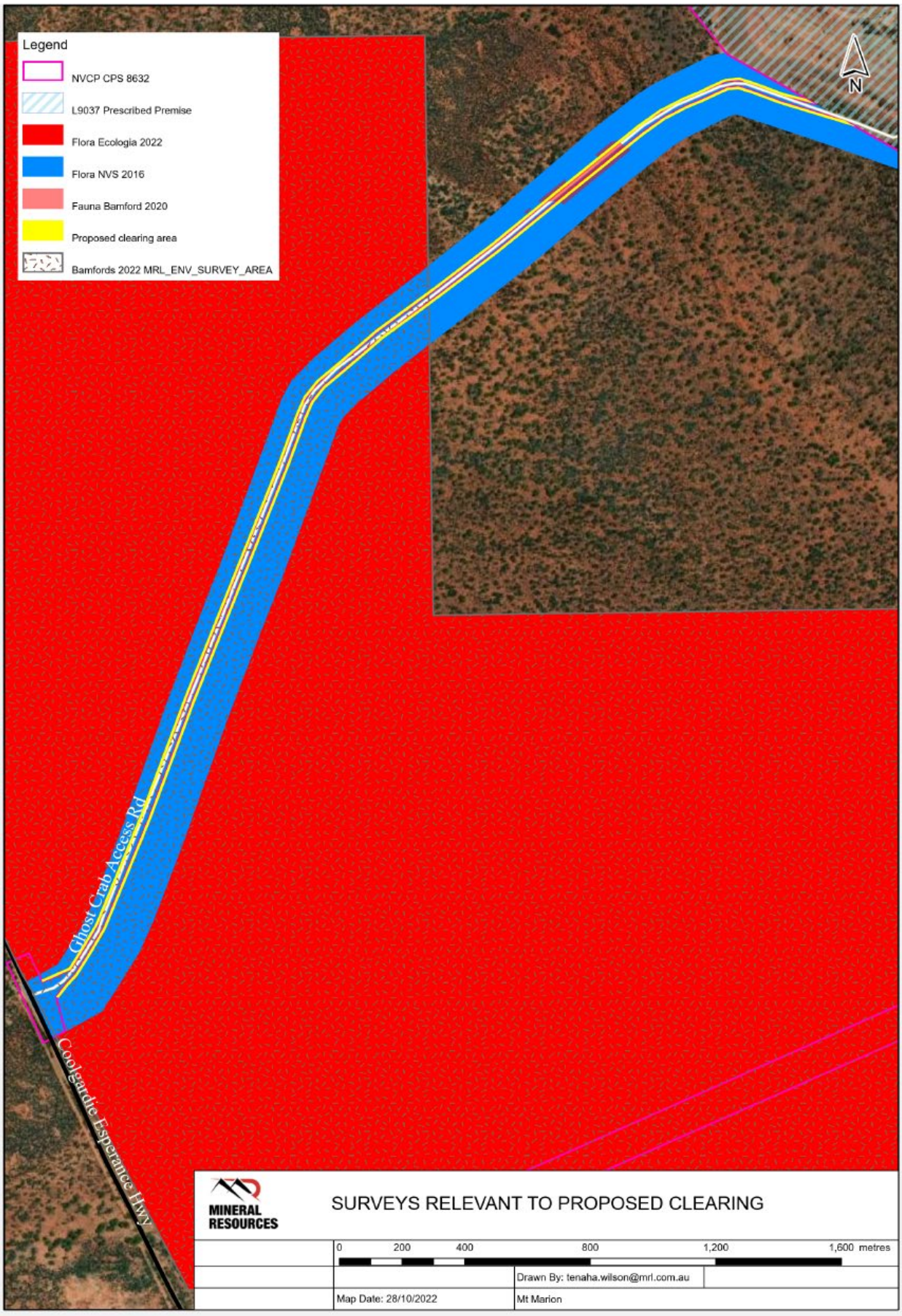

Figure 5-1: Supporting Biological Surveys

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5.2.1 Reconnaissance Flora and Vegetation Assessment (Ecologia, 2022)

A Reconnaissance Flora and Vegetation Assessment was completed by Ecologia on from 20 October to 23 October 2021 (Appendix A), to cover tenement E15/1599 to the west of the Mt Marion operation, which includes part of (62.59%) the proposed clearing application area (Figure 5-3 and Figure 5-2).

One hundred and seventy-three species were recorded within the survey area in 69 vegetation sites and opportunistically, representing 41 families and 94 genera. Twenty-nine species were recorded in three quadrats (VD27, VD28 and VD30), that are in the closest proximity to the proposed clearing area. Figure 6 provides an overview of the survey and quadrat locations (Ecologia, 2022).

Fabaceae was the highest represented Family recorded during the survey, with 20 species (Ecologia, 2022). The next best represented families were Myrtaceae (19 species) and Asteraceae (17 species). The most dominant genera were Acacia (13), Eremophila (13), Eucalyptus (10) and Ptilotus (7).

Five introduced species were recorded in the survey, none of which are listed as a Declared Pest or a Weed of National Significance (WONS). *Centaurea melitensis* has been rated as having 'High' ecological impact and 'Rapid' invasiveness.

The Priority species *Acacia websteri* (P1) was recorded at three sites on sandy clay or loamy sand. The species wasn't identified until post survey, however, cover was recorded as between 5 to 32% at the three sites from where it was recorded. All individuals were recorded from SH02 vegetation type, which is represented out of the proposed clearing area, to the furthest southwest extent of the proposed clearing area in quadrat VD30. It should be noted that this species was not recorded in the NVS (2016) survey. The species is typically located on granite, laterite or quartzite gravelly plain, low hill, undulating plain outcropping or creek (Ecologia, 2022).

Eremophila acutifolia (P3) was recorded opportunistically from one location near the northern boundary of the survey area in an area comprised of the EW02 vegetation type. The population size was estimated at 200 individuals. The species was not identified in proximity to the proposed clearing area and is typically located within areas and vegetation types that are located further north of this site.

There were no EPBC Act (1999) or BC Act (2016) listed Threatened species recorded in this survey (Ecologia, 2022).

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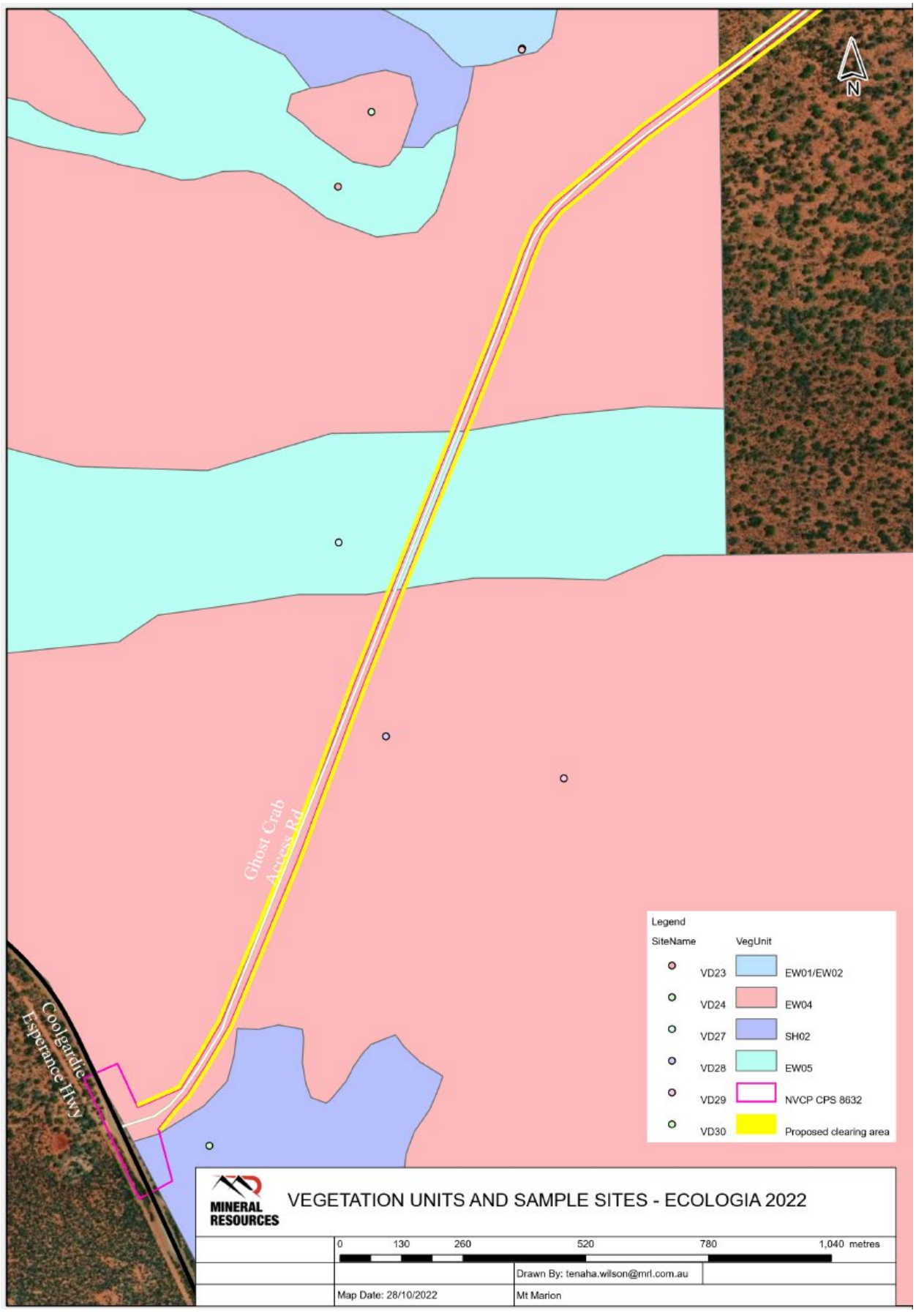

Figure 5-2 Ecologia (2022) Field Vegetation Units and Sample Sites

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5.2.2 Detailed Flora and Vegetation Assessment (NVS, 2016)

A Detailed (formerly Level 1) Flora and Vegetation Assessment was completed by NVS over nine days, from the 21st to 22nd of January; 21st February; 13th, 14th and 20th of March 2013; and 3rd, 4th and 12th October 2015 (Appendix B). The survey was completed to cover the entire Mt Marion project area (Location Lease 53, M15/717, M15/999, M15/1000, E15/972, E15/1190, L15/220 and L15/353) and incorporates the proposed clearing for the access road (L15/360) (Figure 5-2 and Figure 5-3).

One hundred and eight-six species were recorded within the survey area, representing 38 families and 82 genera. One hundred and seventy-three species were recorded in six vegetation types (a, b, c, f, h, v), that intersect the proposed clearing area. Figure 5-3 provides an overview of the survey and quadrat locations (NVS, 2016).

Three introduced species were recorded in the survey - *Sonchus oleraceus* (Common Sowthistle), *Lysimachia arvensis* (Pimpernel) and *Centaurea melitensis* (Maltese Cockspur), none of which are listed as a Declared Pest or a Weed of National Significance (WONS).

The Priority species *Diocirea acutifolia* (P3) was identified in 28 locations within the survey area, including a population located adjacent to the proposed clearing area. A total of 69,686 plants have been estimated to occur within these populations. The population of this species is widespread and in large numbers throughout the local and regional area, is well documented by previous flora surveys. Recorded locations range from Coolgardie, Norseman, Kambalda, Widgiemooltha and Madoonia Downs, with known DPaW records located between 12km and 112km from the survey area. Clearing of the proposed area will not result in changes to the conservation coding or overall populations of this species (NVS, 2016).

There were no EPBC Act (1999) or BC Act (2016) listed Threatened species recorded in this survey (NVS, 2016).

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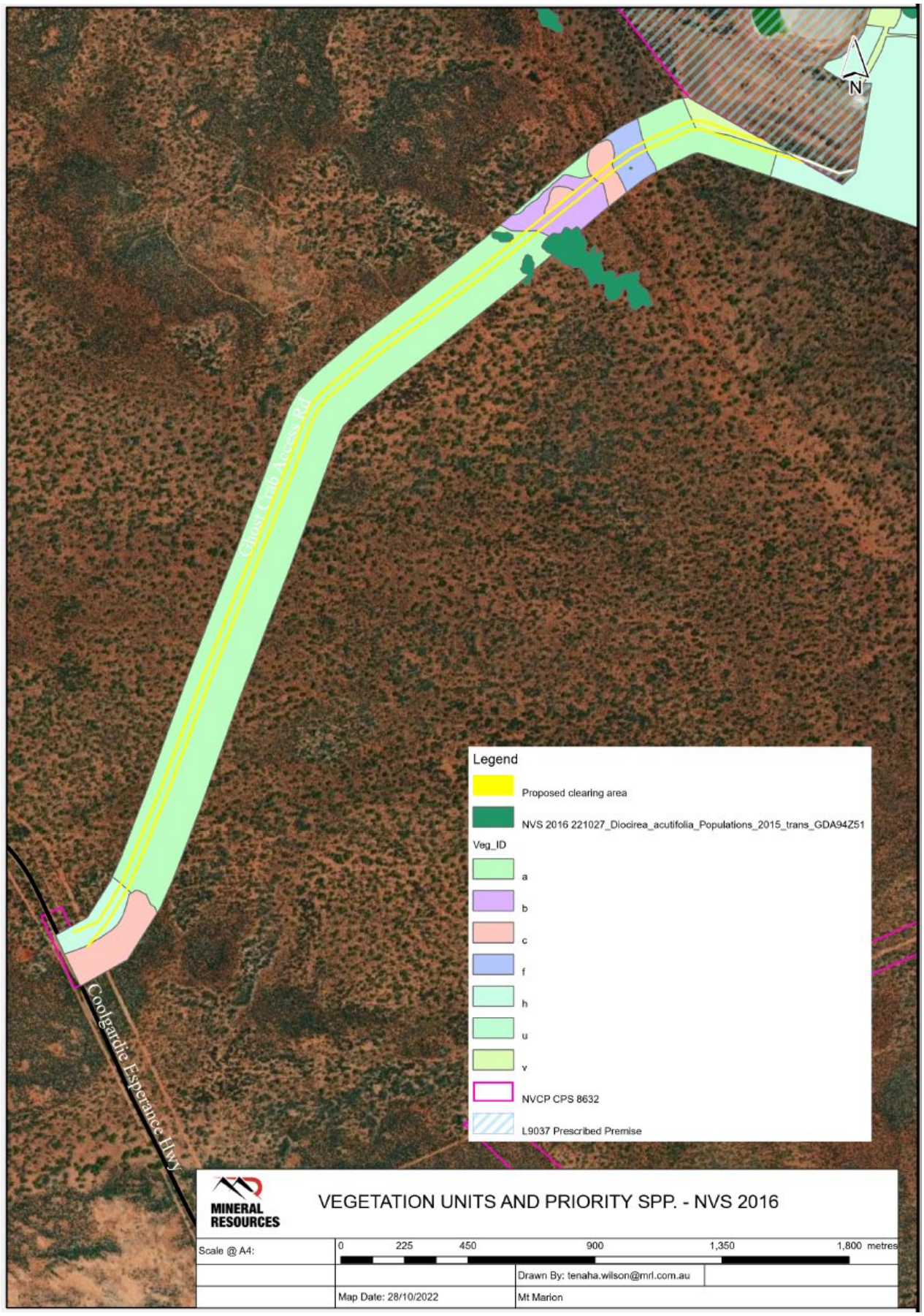

Figure 5-3 NVS (2016) Field Vegetation Units and Sample Sites

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5.3 VEGETATION COMMUNITIES AND CONDITION

Seven vegetation communities were identified in the Ecologia (2022) flora and vegetation survey, comprising mainly of various *Eucalyptus* spp. Woodland, with two of these identified within the proposed clearing area (Figure 6). This is compared to 23 vegetation groups identified during the NVS survey (2016), with six of these identified within the proposed clearing area (Figure 7). The variation between the surveys is mostly due to the Ecologia survey covering the western portion of the proposed clearing area (where L15/360 intersects with E 15/1599), as illustrated in Figure 5. The same portion of the NVS survey also has four related vegetation groups, when compared to the Ecologia survey (2022). The two additional vegetation groups identified in the NVS survey (2016), occur within the eastern most portion of the proposed clearing area.

An overview of the vegetation community extent that intersects with the proposed clearing area is provided in Table 5-2 and illustrated in Figure 5-2 for the Ecologia survey (2022) and Figure 5-3 for the NVS survey (2016).

The most dominant vegetation group within the proposed clearing area for the NVS (2016) survey is vegetation type a - Transitional *Eucalyptus* Woodland over mixed shrubland, covering 5.36 ha of the total proposed clearing area, with a 77.4 % coverage. The least dominant vegetation group is vegetation type f - *Eucalyptus salmonophloia* woodland over mixed shrubland, covering 3.23 % and 0.22 ha of the total proposed clearing area. The area is cleared in 3.7% of the total area (0.26 ha).

The most dominant vegetation group within the proposed clearing area in the Ecologia (2022) survey is vegetation type EW04 - *Eucalyptus* low open Woodland, covering 3.72 ha (85.75%) of the total proposed clearing area, with EW05 - *Eucalyptus* low open Woodland, covering 0.62 ha (14.25 %) of the total proposed clearing area.

As demonstrated in Table 5-2, the vegetation type descriptions vary slightly from the Reconnaissance survey (Ecologia, 2022) to the Detailed survey (NVS, 2016). This may be consequential from a more intense survey over a larger sampling survey area and the survey being completed over several seasons (NVS, 2016), in comparison to a smaller survey area, a lower intensity of survey over one season, and the survey area only covering a portion of the entire proposed clearing area (62.59% of the proposed clearing area). For these reasons, the more detailed survey (NVS, 2016) should be referenced in relation to the vegetation types relevant to this proposed clearing area.

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Table 5-2 Extent of Vegetation Communities that Intersect with the Proposed Clearing Area (Ecologia, 2022 and NVS, 2016)

Vegetation Group (NVS, 2016)	Vegetation Group Code (NVS, 2016)	% Represented in Survey and Clearing Area (NVS, 2016)	Vegetation Group (Ecologia, 2022)	Vegetation Group Code (Ecologia, 2022)	% Represented in Clearing Area (Ecologia, 2022)
Transitional *Eucalyptus* Woodland over mixed shrubland Dominant species: *Eucalyptus transcontinentalis, E. gracilis, E. salmonophloia, E. ravida, Senna artemisioides subsp. artemisioides and Eremophila scoparia.*	a	41.05 % 77.38% 5.37 ha			
Mixed *Eucalyptus* woodland over sclerophyll shrubland on undulating hills Dominant species: *Eucalyptus transcontinentalis, E. lesouefii, E. gracilis, E. ravida, Melaleuca sheathiana, Acacia erinacea* and *Trymalium myrtillus.*	b	24.6 % 6.54% 0.45 ha			
Acacia acuminata* shrubland with emergent *Eucalyptus griffithsii Dominant species: *Eucalyptus griffithsii, Acacia acuminata, Trymalium myrtillus, Scaevola spinescens,* and *Acacia erinacea.*	c	9.35 % 3.84 % 0.27 ha			
Open *Eucalyptus salmonophloia* woodland Dominant species: *Eucalyptus salmonophloia* over *Eremophila scoparia, Senna artemisioides subsp. artemisioides,* and *Dodonaea lobulata*	f	1.33% 3.23% 0.22 ha			

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Mixed *Eucalyptus* over *Melaleuca sheathiana* shrubland Dominant species: *Eucalyptus transcontinentalis, E. lesouefii, E. oleosa subsp. oleosa, E. salmonophloia, E. gracilis, Melaleuca sheathiana, Senna artemisioides subsp. artemisioides, Eremophila scoparia and Olearia muelleri.*	h	3.74% 6.51% 0.45 ha			
Existing Disturbance Area	v	0.18% 3.7% 0.26 ha	Cleared	N/A	0.1%
			Eucalyptus low open Woodland Dominant species: *Eucalyptus griffithsii, Eucalyptus ?platycorys open woodland; Senna artemisioides subsp. filifolia, Eremophila scoparia, Olearia muelleri* sparse shrubland*; Sclerolaena diacantha, Austrostipa scabra subsp. scabra* sparseherb/grassland	EW04	41% 85.75 % 3.72 Ha
			Eucalyptus low open Woodland Dominant species: ±*Eucalyptus griffithsii, Eucalyptus ?oleosa* open woodland*; Acacia ?enervia, Grevillea acuaria, Eremophila ionantha* sparse shrubland*; Maireana georgei, Austrostipa scabra subsp. scabra* sparse herb/grassland.	EW05	15.1% 14.25 % 0.62 ha

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There were no National, State, Regional, or Local significant vegetation types identified in proximity to the proposed clearing area (Ecologia, 2022), nor were there any Threatened or Priority Ecological Communities recorded in either survey area or identified in the PEC/TEC desktop searches (NVS, 2016 and Ecologia, 2022).

Although there was evidence of grazing, as well as historic mining and exploration observed during the field assessment the survey area (NVS, 2016) was found mostly to be in Very Good condition (Keighery, 1994). In comparison, the Ecologia survey (2022) was assessed as being mostly in Excellent condition (99.8%), in accordance with the EPA (2016) vegetation condition scale and having no or only negligible disturbance (e.g., the presence of few non-aggressive weeds).

An overview of the vegetation condition that intersects with the proposed clearing area is illustrated in Figure 5-2 for the Ecologia survey (2022) and Figure 9 for the NVS survey (2016).

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Figure 5-4 Vegetation Condition Ecologia (2022)

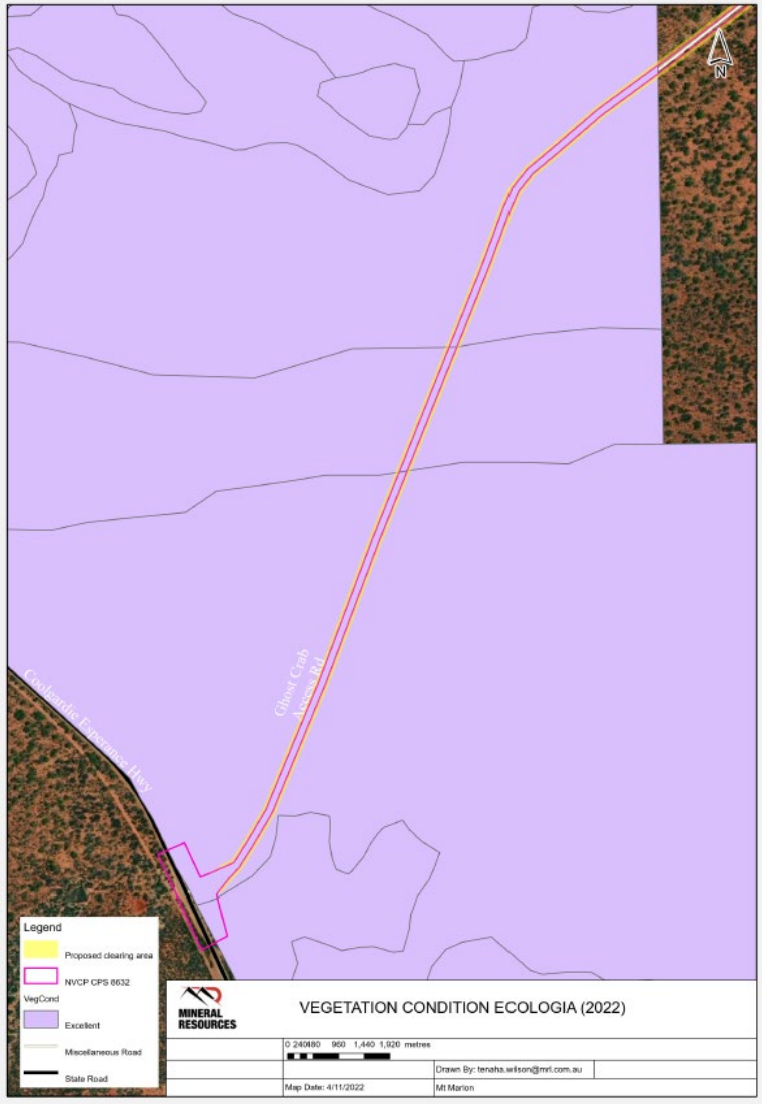
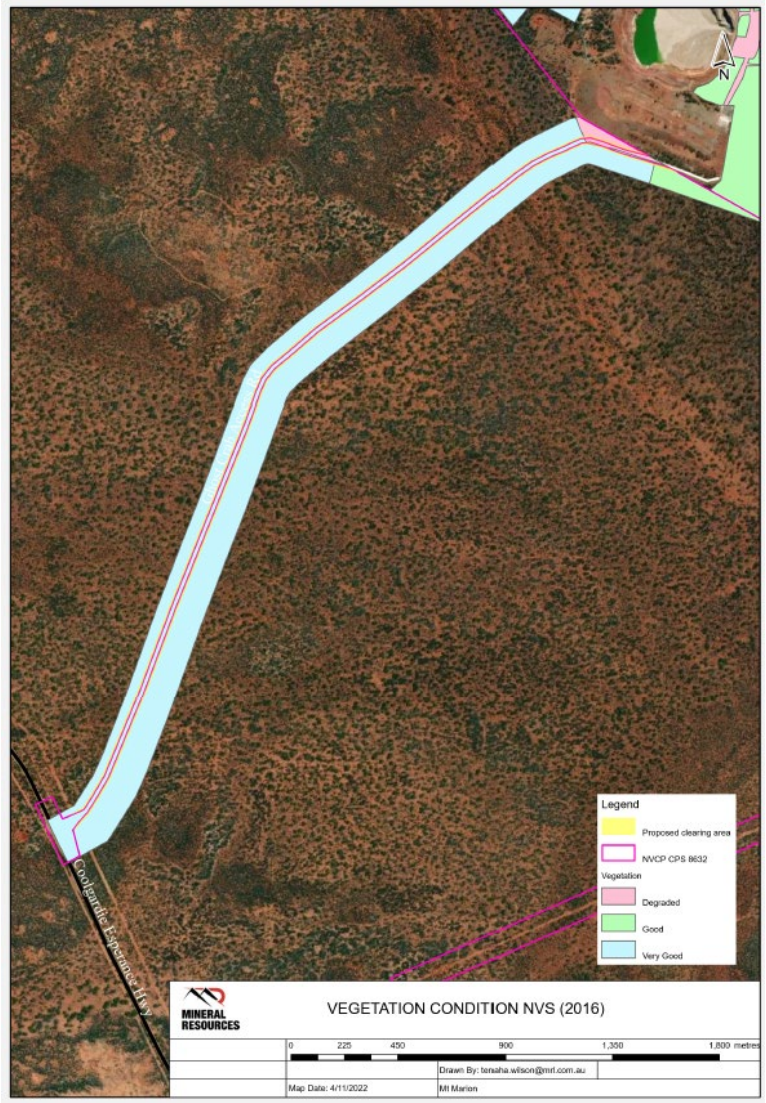


Figure 5-5 Vegetation Condition NVS (2016)



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6. Fauna and Habitat

Three previous fauna assessments are relevant to the proposed clearing area and are referenced, compared, and summarised further below. The relevant areas these surveys cover is illustrated in Figure 5-1 and Figure 6-1.

Table 6-1 summarises the key information of each of these surveys.

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Table 6-1 Fauna assessments relevant to the proposed clearing area

Title of assessment	Consultant	Date of assessment	Appendix Reference	Relevant Survey area	Purpose of Survey
Basic and Targeted Fauna Assessment	Bamford Consulting Ecologists (BCE)	10 – 14th September 2021	Appendix C	Mt Marion Project - [redacted] L15/353, M15/999 and E15/1599	Desktop assessment and targeted survey for conservation significant species Included identification of fauna habitat; opportunistic fauna observations; records of bird encounters; and targeted searches for Malleefowl, Chuditch, Arid Bronze Azure Butterfly (associated with *Camponotus* ants) and Trapdoor spiders.
Malleefowl Survey	Bamford Consulting Ecologists (BCE)	6 – 8 January 2020	Appendix D	All areas of interest for CPS 8632/1 including a smaller area of interest, within the proposed clearing application area for the access road (L15/360)	To identify Malleefowl mounds and critical habitat, whilst satisfying Condition 10 of the Clearing Permit CPS 8632/1.
Review of Fauna Assessments	Bamford Consulting Ecologists (BCE)	July 2019	Appendix E	Mt Marion Project - [redacted] L15/353, M15/999 and E15/1599 including L15/360	Primarily based on fauna assessments that have been conducted across the Mt Marion Lithium Project area since 2010

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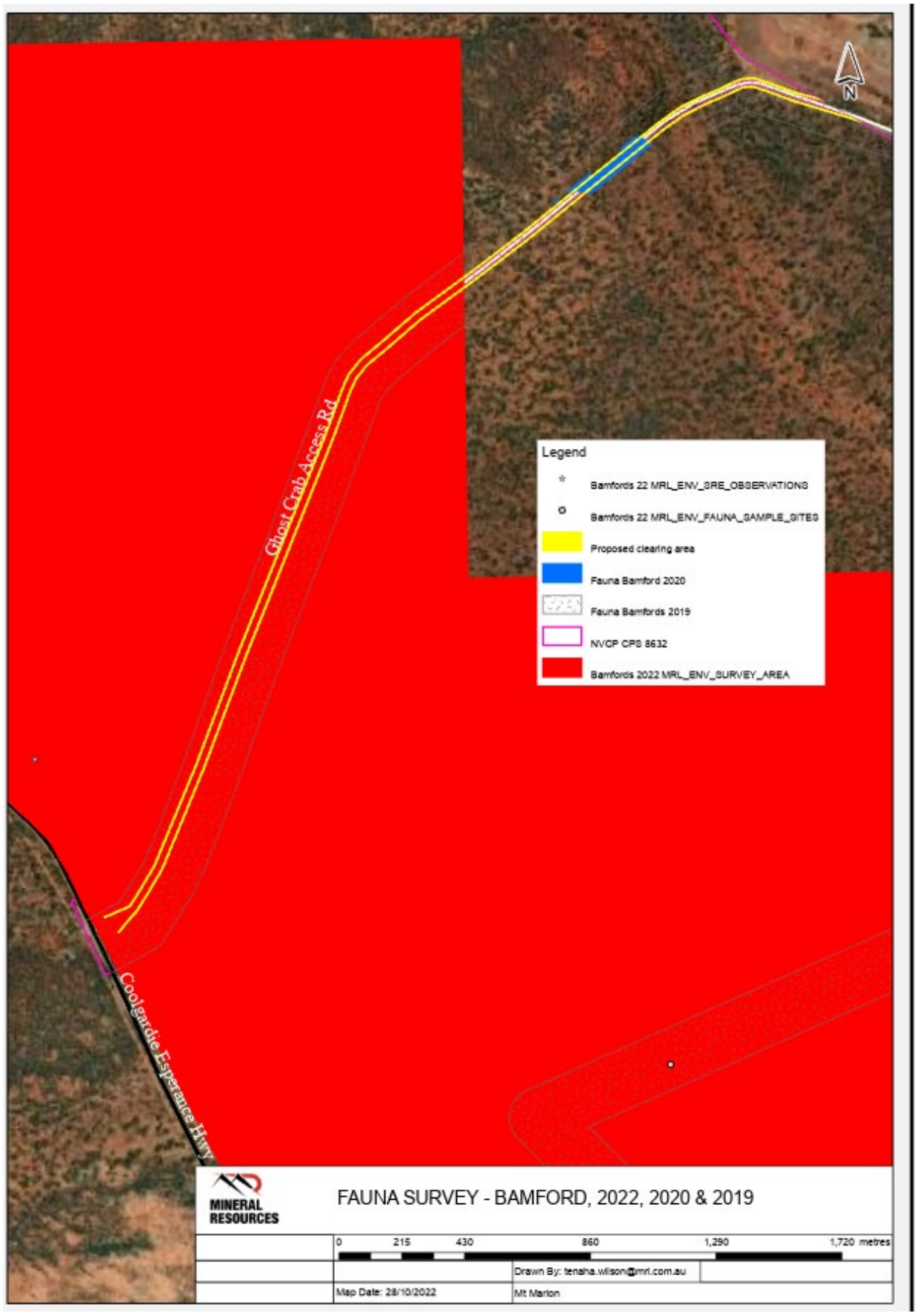
Figure 6-1 Fauna Surveys – Bamfords 2022, 2020 and 2019



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6.1 FAUNA HABITAT

Fauna habitat is referred to as vegetation and substrate associations (VSAs) in the fauna survey (BCE, 2022). The VSAs within the project area are a complex mosaic, largely reflecting soil types. Previous surveys in the Mt Marion area were utilised and compared to provide an understanding of the VSAs considered likely to be present. From this, and observations made during the field investigations, seven major VSAs were identified in relation to fauna in the survey area.

Five of the seven identified VSAs, may be relevant to the main access road L15/360:

- VSA 1 - Mixed Eucalypt woodland over sclerophyll shrubland on undulating hills
- VSA 3 - Open to closed Eucalypt woodland or Mallee over mixed shrubland on flats
- VSA 4 - Mixed Eucalypt woodland over *Melaleuca sheathiana* on gravelly rises
- VSA 5 - Dense Mallee and Eucalypt woodland associated with minor drainage lines
- VSA 6 - Acacia shrubland on brown loam flats

VSA mapping was not available, however the most prevalent VSA previously surveyed in areas of Mt Marion is VSA 3 (Open to closed Eucalypt woodland or Mallee over mixed shrubland on flats). This compares to the prevalent Ecualytpus woodland over shrubland in flora ad vegetation surveys, with vegetation types of EW04 & EW05 in Ecologia (2022) and vegetation groups a and b in NVS (2016).

BCE (2022) considered all VSAs important for fauna, noting large Salmon Gums (*Eucalyptus salmonophloia*) to provide important nesting opportunities for fauna and dense vegetation provide cover and habitat for species such as the Golden Whistler, Western Yellow Robin and Malleefowl (BCE, 2022).

The presence of a range of VSAs are factors in patterns of biodiversity. Fauna that occurs in eucalypt woodlands throughout the region are likely to utilise the project area (BCE, 2022).

No critical habitat for Malleefowl was identified critical habitat in the survey areas during the 2019 and 2020 BCE surveys (BCE, 2019 and BCE, 2020).

6.2 FAUNA

The expected fauna assemblage is typical of the Coolgardie bioregion and Goldfield's eucalypt woodlands, with some species occurring at the eastern edge of their range (Blue-breasted Fairy-wren, Western Yellow Robin) and elements of faunal assemblage from adjacent biogeographic zones (BCE, 2019). The assemblage contains a high level of richness which is expected in such relatively undisturbed intact woodland vegetation and is mostly complete, with a portion of the mammal fauna considered locally extinct (BCE, 2022).

The desktop assessments identified 288 vertebrate fauna species as potentially occurring in the project area, including five frogs, 85 reptiles, 164 birds, 25 native and ten introduced mammals.

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The presence of 95 species (one frog, 12 reptiles, 66 bird species, ten native mammals and six introduced mammals) of these were recorded in previous assessments (BCE, 2019).

2021 field investigations confirmed the presence of three reptiles, 34 birds, two native mammals and one introduced mammal. Notable camera trap detections included one incidence of mating Spotted Nightjars, a family of Emus (one adult male and six juveniles) and a feral cat (BCE, 2022).

6.3 SURVEY AREA

Three broad levels of conservation significance were used in the 2022 BCE fauna report:

- Conservation Significance 1 (CS1) – species listed under State or Commonwealth Acts.
- Conservation Significance 2 (CS2) – species listed as Priority by DBCA but not listed under State or Commonwealth Acts.
- Conservation Significance 3 (CS3) – species not listed under Acts or in publications but considered of at least local significance because of their pattern of distribution.

The desktop assessment identified 33 species of conservation significant fauna expected to occur within the survey area, comprising 10 CS1, two CS2 and 21 CS3 species. Table 6-1 summarises the species of conservation significance present or considered likely to occur in the survey area.

Although 20 significant species were identified to be considered likely to occur as either residents of the survey area, or at least as regular visitors in the 2019 BCE assessment, more recent surveys are yet to locate these species in the project area (BCE, 2022).

Notably, no active or recently used Malleefowl nest mounds or presence of malleefowl (e.g. tracks, droppings, feathers) were identified during the 2019 and 2020 BCE surveys (BCE, 2019 and BCE, 2020) and no conservation significant species were recorded near the proposed clearing area of the main access road (BCE, 2022).

No Chuditch or *Camponotus* ants (associated with the Arid Bronze Azure Butterfly) were recorded in the field near the proposed survey area (BCE, 2022). No Trapdoor Spiders or burrows (of conservation significance) were located near the proposed clearing area, however one widespread species of trapdoor spider (*Gaius villosis*) was located to the north of the proposed clearing area (Figure 6-1).

CS3 species recorded in this survey included the White-browed Babbler *(Pomatostomus superciliosus*) and Copper-backed Quail-thrush (*Cinclosoma clarum)*, with several other species being recorded in previous surveys. More detail on likely conservation significant species is noted in the fauna survey report (Appendix C).

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Table 6-2 Conservation significant taxa

Common Name	Latin Name	Conservation Status				Expected status in project area	Local records
BCA		EPBC	BCA	Priority	CS3		
Conservation Significance 1 (CS1)							
Malleefowl	*Leipoa ocellata*	Vul	Vul			Visitor	Mt Marion
Fork-tailed Swift	*Apus pacificus*	Mig	Mig			Irregular visitor	Woolgangie
Hooded Plover	*Thinornis rubricollis*	Mig	Mig			Vagrant	Bulong
Sharp-tailed Sandpiper	*Calidris acuminata*	Mig	Mig			Vagrant	Kambalda West
Curlew Sandpiper	*Calidris ferruginea*	Mig	Mig			Vagrant	Kambalda East
Red-necked Stint	*Calidris ruficollis*	Mig	Mig			Vagrant	Kambalda East
Common Greenshank	*Tringa nebularia*	Mig	Mig			Vagrant	Kambalda East
Wood Sandpiper	*Tringa glareola*	Mig	Mig			Vagrant	Kambalda East
Peregrine Falcon	*Falco peregrinus*		OS			Visitor	St Ives
Chuditch	*Dasyurus geoffroyii*	Vul	Vul			Vagrant to Irregular Visitor	Kalgoorlie
						Conservation Significance 2 (CS2)	
Western Rosella (Inland)	*Platycercus icterotis xanthogenys*			4		Irregular Visitor	Kalgoorlie
Central Long-eared Bat	*Nyctophilus major tor*			3		Resident	Coolgardie
Conservation Significance Level 3							
Carpet Python	*Morelia spilota imbricata*				X	Resident	Kalgoorlie
Australian Bustard	*Ardeotis australis*				X	Irregular Visitor	Coolgardie
Bush Stone-curlew	*Burhinus grallarius*				X	Visitor	Jilbadji
Square-tailed Kite	*Lophoictinia isura*				X	Visitor	St Ives
Purple-crowned Lor keet	*Glossopsitta porphyrocephala*				X	Resident	Mt Marion
Regent Parrot	*Polytelis anthopeplus*				X	Visitor	St Ives
Scarlet-chested Parrot	*Neophema splendida*				X	Irregular Visitor	St Ives
Major Mitchell's Cockatoo	*Cacatua leadbeateri*				X	Visitor	Coolgardie
Rainbow Bee-eater	*Merops ornatus*				X	Regular Visitor	Mt Marion
White-browed Treecreeper	*Climacteris affinis*				X	Resident	Cannon
Rufous Treecreeper	*Climacteris rufus*				X	Resident	Mt Marion
Blue-breasted Fairy- wren	*Malurus pulcherrimus*				X	Resident	Mt Marion
Purple-gaped Honeyeater	*Lichenostomus cratitius*				X	Resident	Kalgoorlie
Shy Heathwren	*Hylacola cauta whitlocki*				X	Irregular visitor	St Ives
White-browed Babbler	*Pomatostomus superciliosus*				X	Resident	Mt Marion
Copper-backed Quail-thrush	*Cinclosoma clarum*				X	Resident	Mt Marion
Gilbert's Whistler	*Pachycephala inornata*				X	Resident	Mt Marion
Crested Shrike-tit	*Falcunculus frontatus*				X	Resident	Kalgoorlie
Western Yellow Robin	*Eopsaltria griseogularis*				X	Resident	Mt Marion
Southern Scrub-robin	*Drymodes brunneopygia*				X	Irregular Visitor	Mt Marion
Kultarr	*Antechinomys laniger*				X	Resident	Kalgoorlie

Note: EPBC Act (EPBC) and Biodiversity Conservation Act (BCA): Vul: Vulnerable; End: Endangered; CE: Critically Endangered, Mig: Migratory, OS: Other Specially Protected Fauna; DBCA Priority: P1 – P4 = Priority 1 - 4. CS3: locally significant but not listed.

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7. AVOIDANCE AND MITIGATION

MRL has an Environmental Management System (EMS) applicable to the Mt Marion operation. This system includes awareness training, plans, procedures and forms to avoid, minimise and ensure the effective management of environmental and heritage values. Strategies to avoid, minimise and manage environmental impacts Strategies to avoid, minimise and manage environmental impacts are built into the project's Site Disturbance Procedure (SDP). The SDP is a form completed specific to each project that involves ground disturbance, to ensure that relevant environmental and heritage obligations are understood, complied with and that the risks are effectively managed.

The list of procedures applicable to exploration are provided in Table 7-1. These are considered sufficient to ensure the effective management of environmental and heritage risk by the proposal.

Table 7-1 Mt Marion environmental management plan (MRL, 2019)

Document number	Document name
MRL-EN-PRO-0004	Land Clearing Procedure
MRL-EN-PRO-0005	Site Disturbance Procedure
MRL-EN-PRO-0001	Fauna Management Procedure
MRL-TS-WIN-0006	Clearing Work Instruction
MRL-EN-PRO-0007	Weed Hygiene and Control
MRL-EN-PRO-0009	Land Rehabilitation Procedure

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8. ASSESSMENT AGAINST THE TEN CLEARING PRINCIPLES

An assessment has been completed against the Ten Clearing Principles (*EP Act 1986,* Schedule 5) to determine if there is a likely significant environmental impact as a result of the clearing native vegetation for the purposes of this project, within the proposed application area.

Each principle was assessed in accordance with Department of Environmental Regulation's (DER) "A Guide to the Assessment of Applications to Clear Native Vegetation" (DER, 2014).

In summary, the proposed clearing is not likely to be or at variance to Clearing Principles (A) to (J), as referenced below.

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Table 8-1 Identified Impacts against Clearing Principles

Red – Likely to be at variance, Orange – May be at variance, Green – Not likely to be or not at variance

Clearing Principle	Impact Category	Assessment of Clearing Principle
(a) Native vegetation should not be cleared if it comprises a high level of biological diversity	Green	The vegetation and flora survey (Ecologia, 2022) identified 173 species, representing 41 families and 94 genera within 69 vegetation sites. The survey was completed in tenement E15/1599, which is located west of the Mt Marion operation and includes part of the proposed clearing application area (L/15/360). Twenty-nine species were recorded in three quadrats (VD27, VD28 and VD30), that are in the closest proximity to the proposed clearing area. There were no EPBC Act (1999) or BC Act (2016) listed Threatened species recorded in this survey (Ecologia, 2022). Two priority species were recorded in the relevant surveys, including *Acacia websteri* (P1) in the Ecologia (2022) survey and *Diocirea acutifolia* (P3) in the NVS (2016) survey. It is not anticipated that the clearing will have an impact on the conservation significance of this species. The relevance of the Priority species is further elaborated against Principle (c). The NVS survey (2016) identified three introduced species were recorded in the survey - *Sonchus oleraceus* (Common Sowthistle), *Lysimachia arvensis* (Pimpernel) and *Centaurea melitensis* (Maltese Cockspur), none of which are listed as a Declared Pest or a Weed of National Significance (WONS). Four of the seven vegetation communities identified in the Ecologia (2022) flora and vegetation survey, intersect with the proposed clearing area, compared to six of the 23 vegetation types identified in the more detailed NVS survey (2016). These vegetation types comprise mainly of mixed Eucalyptus spp. Woodland over shrubland. There were no National, State, Regional, or Local significant vegetation types identified in proximity to the proposed clearing area (Ecologia, 2022), nor were there any Threatened or Priority Ecological Communities recorded in either survey area or identified in the PEC/TEC desktop searches (NVS, 2016 and Ecologia, 2022). The condition of the vegetation was observed to be mostly in Very Good condition (Keighery, 1994) during the NVS survey (NVS, 2016) and mostly in Excellent condition (99.8%), in accordance with the EPA (2016) vegetation condition scale and having no or only negligible disturbance (e.g., the presence of few non-aggressive weeds) for the Ecologia survey (2022). No reserves, conservation areas or other DBCA Managed Estate are located within the proposed clearing area, however, Yallari Timber Reserve is located directly adjacent to the west of the main access road. The assemblage contains a high level of richness which is expected in such relatively undisturbed intact woodland vegetation and is mostly complete, with a portion of the mammal fauna considered

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Clearing Principle	Impact Category	Assessment of Clearing Principle
		locally extinct (BCE, 2022). The assemblage is typical of the Coolgardie region and Goldfield's eucalypt woodlands, with some species occurring at the edge of their range in the project area. Although 20 significant species were identified to be considered likely to occur as either residents of the survey area, or at least as regular visitors in the 2019 BCE assessment, more recent surveys are yet to locate these species in the project area (BCE, 2022). Notably, no active or recently used Malleefowl nest mounds or presence of malleefowl (e.g. tracks, droppings, feathers) were identified during the 2019 and 2020 BCE surveys (BCE, 2019 and BCE, 2020) and no conservation significant species were recorded near the proposed clearing area of the main access road (BCE, 2022). With the management measures in place, the proposed clearing is expected to be of minimal risk to biodiversity values. Proposed clearing of this proposal is therefore unlikely to be at variance to this Principle.
(b) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia.	**Green**	As noted by BCE (2022) the overall residual impact on conservation significant species is negligible with most of the vegetation types well represented in the region (BCE, 2022). The most prevalent vegetation type identified in areas of Mt Marion is Open to closed Eucalypt woodland or Mallee over mixed shrubland on flats (BCE, 2022, 2020 and 2019). This compares to the prevalent *Ecualytpus* woodland over shrubland in flora ad vegetation surveys, with vegetation types of EW04 & EW05 in Ecologia (2022) and vegetation groups a and b in NVS (2016). Although 20 significant species were identified to be considered likely to occur as either residents of the survey area, or at least as regular visitors in the 2019 BCE assessment, more recent surveys are yet to locate these species in the project area (BCE, 2022). Notably, no active or recently used Malleefowl nest mounds or presence of malleefowl (e.g. tracks, droppings, feathers) were identified during the 2019 and 2020 BCE surveys (BCE, 2019 and BCE, 2020) and no conservation significant species were recorded near the proposed clearing area of the main access road (BCE, 2022). No critical habitat for Malleefowl was identified critical habitat in the survey areas during the 2019 and 2020 BCE surveys (BCE, 2019 and BCE, 2020). No Chuditch or Camponotus ants (associated with the Arid Bronze Azure Butterfly) were recorded in the field near the proposed survey area (BCE, 2022). No Trapdoor Spiders or burrows (of conservation significance) were located near the proposed clearing area, however one widespread species of trapdoor spider (*Gaius villosis*) was located to the north of the proposed clearing area. MRL intends to avoid and minimise impacts to significant habitat for fauna. Clearing therefore is unlikely be at variance to this principle.
(c) Native vegetation should not be cleared if it includes, or is necessary	**Green**	Desktop searches identified the potential for three Threatened and 67 Priority Flora species to occur within a 40 km radius of the survey area in the NVS assessment (2016). This assessment revealed that whist these taxa are considered to have the potential to occur within the survey area, based on their proximity and similar habitat, none of these known locations occur within the survey area, while

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Clearing Principle	Impact Category	Assessment of Clearing Principle
for the continued existence of, rare flora.		the closest location occurs approximately 1.09km away from the south-eastern section of the survey area (DPaW, 2015a); and therefore further removed and several kilometres away from the proposed clearing area within the main access road L15/360. More recently, database searches by Ecologia (2022), indicated 66 significant plant taxa within the desktop study area, including two Threatened taxa, 23 Priority 1 taxa, 11 Priority 2 taxa, 25 Priority 3 taxa, and five Priority 4 taxon. This desktop assessment (2022) revealed that 49 taxa potentially occur within the survey area ('likely' and 'possible' ratings); with 17 taxa considered unlikely to occur due to the probable absence of suitable habitat within the survey area or because they are known to have very restricted distributions and have not been recorded in the vicinity of the survey area. The EPBC Protected Matters search tool revealed that the survey area could possibly be suitable habitat for Endangered Plant species *Gastrolobium graniticum* (Granite Poison), which is generally restricted to granite outcrops (NVS, 2016). This species is now listed as Threatened under the BC Act 2016 (DBCA, 2022). Although there are 12 records of this species occurring within 50km of the survey areas, the latest record occurred in 2017 (Ecologia, 2022) and the species was not recorded during either field survey (Ecologia, 2022 and NVS, 2016). Ecologia (2022) recorded priority species *Acacia websteri* (P1) at three sites on sandy clay or loamy sand, with a vegetation cover of 5% - 32%. All individuals were recorded from SH02 vegetation type, which is represented outside the clearing area, at the furthest southwest extent of the proposed clearing area and in quadrat VD30. Therefore, the clearing will not have an impact on the conservation significance of this species. It should be noted that this species was not recorded in the NVS (2016) survey. The Priority species *Diocirea acutifolia* (P3) was identified in 28 locations within the NVS (2016) survey area, including a population located adjacent to the proposed clearing area. A total of 69,686 plants have been estimated to occur within these populations. The population of this species is widespread and in large numbers throughout the local and regional area, is well documented by previous flora surveys. Recorded locations range from Coolgardie, Norseman, Kambalda, Widgiemooltha and Madoonia Downs, with known DPaW records located between 12km and 112km from the survey area. Clearing of the proposed area will not result in changes to the conservation coding or overall populations of this species (NVS, 2016). Based on the above, the clearing bears no impact on the continued existence of rare flora and is not likely to be at variance to this Principle.
d) Native vegetation should not be cleared if it comprises the whole or a part of or is necessary for the maintenance of a threatened ecological community.	**Green**	Desktop searches identified no PEC or TECs within 50 km of the survey area. Field surveys confirmed that there is no PEC or TECs within the survey area, and hence the proposed clearing area. The clearing of native vegetation is therefore not at variance to this principle.

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Clearing Principle	Impact Category	Assessment of Clearing Principle
(e) Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.	Green	The condition of the vegetation was observed to be mostly in Very Good condition (Keighery, 1994) during the NVS survey (NVS, 2016) and mostly in Excellent condition (99.8%), in accordance with the EPA (2016) vegetation condition scale and having no or only negligible disturbance (e.g., the presence of few non-aggressive weeds) for the Ecologia survey (2022). Five Beard vegetation associations fall within the relevant survey areas (Ecologia, 2022 and NVS, 2016), with the extent of all survey vegetation units being well above the 30% threshold at a State, bioregional, subregional and Shire level (> 90%). The percentage of Pre-European vegetation extent remaining within the Coolgardie Shire for Beard Vegetation Associations 9; 128; 522; 936; and 1413 is 99.8%; 99.6%; 99.9%;99.6%; and 98.2 %, respectively. As noted in BCE (2022), the project area lies within the Coolgardie Vegetation System. All woodlands in the Coolgardie System have been logged in the past for mining timber and firewood and current vegetation is secondary growth regenerated from seed and coppice (Beard, 1972). Given the above, the clearing of native vegetation is unlikely to be at variance to this principle
(f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.	Green	There are no permanent watercourses or wetlands within or in the vicinity of the survey area. The nearest water bodies are located over 20km to the north of the proposed clearing area (Lake Douglas, Lake Red and Lake Brown), with the next closest water body being Lake Lefroy, located approximately 26km to the southeast of the proposed clearing area. The clearing of native vegetation is unlikely to be at variance to this principle.
(g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.	Green	Any clearing of native vegetation within the survey area has the potential to cause soil and wind erosion. The landscape units for this survey area are Kambalda (265) and Norseman (266) (DPIRD, 2019). Both have similar topography with variations in calcareous loamy earths, which when extensively cleared and left unrehabilitated, are prone to erosion. The area is arid, and unlikely to flood or become waterlogged with minor ephemeral water courses recorded in vegetation surveys by GHD (2018). The potential for soil erosion and appreciable land degradation to occur from the implementation of this proposal is unlikely. The clearing of native vegetation is unlikely to be at variance to this principle.

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Clearing Principle	Impact Category	Assessment of Clearing Principle
(h) Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.	Green	No reserves, conservation areas or other DBCA-managed estates are located within the survey area. One conservation area occurs adjacent to the survey area - Yallari Timber Reserve, west of the access to the project. The proposal would not significantly impact upon either of the areas above or affect the values associated with these areas. The clearing of native vegetation is unlikely to be at variance to this principle.
(i) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.	Green	The survey area is located in the *Rights in Water and Irrigation Act 1914* (RIWI Act) listed Goldfields Groundwater Area (DWER, 2022) and the Salt Lake Basin Surface Water Management Area and Sub-area. No rivers or surface water bodies listed under the RIWI Act were identified within the survey area. There are minor ephemeral drainage lines located within the survey area. No lakes, wetlands or natural water bodies were recorded in the survey area. Average rainfall for the area is 270 mm and relatively evenly distributed throughout the year. However, rainfall is erratic from year to year. During heavy localised rainfall events erosion may occur in cleared areas leading to temporary soil erosion and/or sedimentation, particularly in the vicinity of ephemeral drainage lines. Clearing within or near a drainage line should be avoided. On this basis, clearing of vegetation in the permit area is unlikely to cause appreciable deterioration in the quality of surface or underground water. The clearing of native vegetation is unlikely to be at variance to this principle.
(j). Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.	Green	The climate of the region is described as semi-arid with an average annual rainfall of 270 mm. Rainfall is relatively evenly spread throughout the year but can occur in heavy localised falls. Based on an average daily evaporation rate of 7.2 mm, any surface water resulting from rainfall events is likely to be relatively short lived. In addition, the survey area is surrounded by native vegetation, and it is likely that a large proportion of runoff will be absorbed by this natural environment. The survey area is characterised by flat to gently undulating plains with silty clay soils and occasional rocky rises scattered throughout the survey area. There are no permanent drainage channels or wetlands within or in the vicinity of the survey area, with one minor ephemeral drainage line within the survey area that is only likely to flow following heavy rain. According to GIS analysis and examination of aerial imagery of the area, vegetation is well represented in the local area and comprises of low woodland or low open woodland. There are no extensively cleared areas of riverbank, paddock, pasture or fallow land near the proposal area that could exacerbate flooding. Any surface flow is expected to be minimal, and it is unlikely that clearing for this project will lead to an appreciable increase in runoff that could cause, or exacerbate, the incidence of flooding. The clearing of native vegetation is unlikely to be at variance to this principle.

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10. GLOSSARY

Excellent	Pristine or nearly so, no obvious signs of disturbance or damage caused by human activities since European settlement. Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species. Damage to trees caused by fire, the presence of non-aggressive weeds and occasional vehicle tracks (EPA, 2016)
Habitat trees	Habitat trees contain suitably formed hollows, with a Diameter Breast Height of more than 500 mm and 300 mm.
Permit area	Approximately 7 ha of clearing of native vegetation is proposed either side of the main access road, L15/360.
Priority flora	Plant taxa listed by Parks and Wildlife (now DBCA) that are either under consideration as threatened flora but are in need of additional survey to adequately determine their status, or are adequately known but require monitoring to ensure that their security does not decline.
Survey area	The survey is the area surveyed by BCE (2019, 2020 and 2022); NVS (2016); and BCE (2022). The data of which has been collated to inform this supporting document. BCE (2019, 2020 and 2022); NVS (2016); and BCE (2022)
Study area	The study area is the area referred by BCE (2019, 2020 and 2022); NVS (2016); and BCE (2022) to the area assessed in desk environmental impact assessment used to inform the field survey.
Very Good	Vegetation structure altered, very obvious signs of disturbance. For example, disturbance to vegetation structure caused by frequent fires; the presence of some very aggressive weeds at high density; partial clearing; dieback and grazing (Keighery, 1994).

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11. ABBREVIATIONS

BC Act	*Biodiversity Conservation Act 2016 (WA)*
BCE	Bamford Consulting Ecologists
CALM	Conservation and Land Management
CPS	Clearing Permit System
DBCA	Western Australian Department of Biodiversity, Conservation and Attractions
DAWE	Australian Department of Agriculture, Water and the Environment
DER	Department of Environmental Regulation
DMIRS	Department of Mines, Industry Regulation and Safety
DWER	Western Australian Department of Water and Environmental Regulation (formerly DoW)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
EP Act	*Environmental Protection Act 1986*
GIS	Geospatial Information Systems
ha	hectare(s)
IBRA	Interim Biogeographic Regionalisation for Australia
km	kilometre(s)
LOM	Life of Mine
m	metre(s)
mg/L	milligrams per litre
Mining Act	*Mining Act 1978*
mm	millimetres
MRL	Mineral Resources Limited
MSA	Mine Services Agreement
Mt	Mount
NVS	Native Vegetation Solutions
P	Priority
PEC	Priority Ecological Community
PMI	Process Minerals International Pty Ltd
PMST	Protected Matters Search Tool
RIM	Reed Industrial Minerals
TDS	total dissolved solids
TEC	Threatened Ecological Community
VSA	Vegetation and Substrate Associations
WA	Western Australia
Westgold	Westgold Resources

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APPENDICES

Appendix	Title
A	Reconnaissance Flora and Vegetation Assessment (Ecologia, 2022)
B	Level 1 Flora and Vegetation Survey for the Mt Marion Project Area (NVS, 2016)
C	Basic and Targeted Fauna Assessment (Bamford Consulting Ecologists, 2022)
D	Malleefowl Survey (Bamford Consulting Ecologists, 2020)
E	Review of Fauna Assessments covering the Mt Marion Lithium Project Lease Area (Bamford Consulting Ecologists, 2019)

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Appendix A Reconnaissance Flora and Vegetation Assessment (Ecologia, 2022)

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Appendix B Level 1 Flora and Vegetation Survey for the Mt Marion Project Area (NVS, 2016)

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Appendix C Basic and Targeted Fauna Assessment (Bamford Consulting Ecologists, 2022)

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Appendix D Malleefowl Survey (Bamford Consulting Ecologists, 2020)

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Appendix E Review of Fauna Assessments covering the Mt Marion Lithium Project Lease Area (Bamford Consulting Ecologists, 2019)

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Appendix F Proof of Lease and Ownership L15/360

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