



**NORTHERN STAR**  
R E S O U R C E S L T D

# **KALGOORLIE REGIONAL RENEWABLE ENERGY PROJECT**

## **Native Vegetation Clearing Permit**

### **Supporting Document**

<b>Revision</b>	1.1
<b>Date</b>	17 February 2026
<b>Proposal</b>	Kalgoorlie Regional Renewable Energy Project
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## Executive Summary

This document has been prepared by Northern Star (EGP) Pty Ltd (Northern Star) to support a purpose permit application for the proposed Kalgoorlie Regional Renewable Energy Project (KRRE) (the Proposal). The Proposal involves the development of a wind and solar farm to be located north-east of the Kalgoorlie Consolidated Gold Mines (KCGM) operations.

The Proposal will require up to 652 ha total to be cleared within a 2,312 ha Development Envelope. Most of the clearing (621 ha) is proposed to be conducted using a native vegetation clearing permit (NVCP) (this application). A small proportion of clearing (up to 21.5 ha of the 652 ha total) is proposed to be conducted under clearing permit exemptions (Regulation 5, Item 20) for pending tenements associated with site access and services, as pending tenements cannot be included in a NVCP application. The remaining 10 ha of land disturbance is proposed within previously cleared land that will not require clearing of native vegetation.

This NVCP application seeks approval to clear up to 621 ha of native vegetation within an approximately 2,264 ha Clearing Footprint. The Clearing Footprint lies predominantly within mining tenements held by Northern Star. A small portion of the Clearing Footprint will be required within a road reserve managed by the City of Kalgoorlie-Boulder.

A comprehensive suite of baseline surveys was undertaken to identify and describe environmental values within the Clearing Footprint and a broader 13,191 ha Study Area. Following completion of the baseline surveys, the Proposal design has been refined to avoid and minimise environmental impacts as much as practicable. This iterative design process has resulted in a total of 54 Exclusion Zones excised from the Development Envelope to protect environmental and social values.

The Proposal has been developed to manage potential impacts to the environment using a risk-based approach and applying the mitigation hierarchy of avoid, minimise, rehabilitate and offset. Following implementation of the proposed mitigation and management measures, the Proposed clearing is predicted to not be at variance with Clearing Principles (c), (d), (e), (h), (i) and (j), not likely to be at variance with Clearing Principles (a), (b) and (g), and may be at variance with Clearing Principle (f).

A summary of the clearing application is presented in Table ES-1 and a summary of the outcomes of assessment against the 10 clearing principles is provided in Table ES-2.

**Table ES-1: NVCP Summary**

Item	Description
Proposal Name	Kalgoorlie Regional Renewable Energy Project
Project No.	PRJ-0018094
Proponent Name	Northern Star (EGP) Pty Ltd
Permit Type	Purpose Permit
Clearing Purpose	Power generation and associated activities
Clearing Method	Mechanical Clearing
Location	Mining Tenements: L26/297, M26/383, M26/489, M26/495, M26/496, M26/503, M26/577, M26/625, M26/646, G27/3, G27/4. Road Reserve: Lot 428 on Plan P028432
Local Government Area	City of Kalgoorlie - Boulder
Clearing Area	621 ha
Clearing Footprint	2,263.54 ha
Related Documents	Referral Supporting Document (RSD) Environmental Management Plan (EMP)



**Table ES-2 Summary Clearing Assessment**

Clearing Principle	Receiving Environment	Mitigation Measures Adopted	Variance Level with Mitigation Measures / Justification
<p><b>(a) Native vegetation should not be cleared if it comprises a high level of biological diversity</b></p>	<ul style="list-style-type: none"> <li>Biodiversity typical of the region.</li> <li>No Threatened flora, TECs or PECs have been identified in the Clearing Footprint.</li> <li>Five vegetation types are considered to potentially have some local significance:               <ul style="list-style-type: none"> <li>MsMsEpa is spatially restricted representing less than 1% of the Clearing Footprint</li> <li>CpSafMs, CpSSaE, EISaMt, EREpMt have potential provide suitable habitat for Priority flora.</li> </ul> </li> <li>Three Priority Flora species known from the Study Area: <i>Eremophila praecox</i> (Priority 2), <i>Allocasuarina eriochlamys</i> subsp. <i>grassa</i> (Priority 3) and <i>Notisia mtosa</i> (Priority 3). None of these species occur within the Clearing Footprint.</li> <li>Two records of <i>Streptoglossa cylindriceps</i> (non-listed) were identified within the Clearing Footprint, which represents a range extension of 80 km and are potentially locally significant, despite the species having an expansive range across Australia.</li> </ul>	<p><b>Avoid</b></p> <ul style="list-style-type: none"> <li>All occurrences of Priority Flora have been excised from the Clearing Footprint as well as a minimum 10 m protective buffer.</li> </ul> <p><b>Minimise</b></p> <ul style="list-style-type: none"> <li>Clearing will be minimised to the amount necessary.</li> <li>Clearing to be conducted in accordance with an approved internal Disturbance Permit.</li> <li>Stage land clearing to minimise exposure of surface where practicable.</li> <li>Dust suppression implemented to minimise potential indirect impacts from fugitive emissions.</li> <li>Restrict vehicle speeds to a maximum of 40 km/hr on unsealed roads during construction to reduce dust generation.</li> <li>Use designated access road and tracks and limit unnecessary vehicle movement</li> <li>Vehicle hygiene protocols to be implemented to prevent introduction of weeds into the Clearing Footprint.</li> <li>Weed control to be implemented as needed.</li> <li>No fill brought to the site unless certified clean.</li> <li>Surface water drainage to be maintained with appropriate surface water infrastructure.</li> </ul> <p><b>Rehabilitate</b></p> <ul style="list-style-type: none"> <li>Progressive rehabilitation in accordance with a mine closure plan approved under the Mining Act.</li> </ul>	<p><b>Not likely to be at variance</b></p> <ul style="list-style-type: none"> <li>The Proposal will require clearing 621 ha of vegetation.</li> <li>Vegetation proposed for clearing is characterised by biological assemblages that are well represented in the Study Area and surroundings.</li> <li>The Proposal will require clearing of up to 302.5 ha of vegetation types that may be locally significant:       <ul style="list-style-type: none"> <li>About 0.5 ha of the 18.33 ha of MsMsEpa within the Clearing Footprint will require clearing. This represents a 2.7% reduction in the patch of MsMsEpa within the Clearing Footprint. Given 97.3% of the patch of MsMsEpa will be retained, this impact is not significant.</li> <li>Up to 302 ha of vegetation that is potentially suitable habitat for <i>Eremophila praecox</i> (P2) will that require clearing. 4,093 ha (93%) of habitat suitable for <i>E. praecox</i> will be retained within the Study Area. While vegetation types CpSafMs, CpSSaE, EISaMt and EREpMt may provide suitable habitat for <i>E. praecox</i>, this species occurs in a variety of vegetation types and land units throughout the region and vegetation types within the Clearing Footprint are not critical for conservation of this species.</li> </ul> </li> <li>Clearing will avoid direct disturbance to Priority flora and indirect impacts can be adequately mitigated through the implementation of the proposed mitigation measures e.g. dust and surface water management.</li> <li>Up to two <i>Streptoglossa cylindriceps</i> (non-listed) may be cleared. The plants are potentially locally significant due to being a potential range extension for the species. This species occurs over an expansive range that extends throughout WA and NT. Clearing these plants is unlikely to have a significant impact on the overall biological diversity in the region or the conservation of this species.</li> </ul>
<p><b>(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</b></p>	<ul style="list-style-type: none"> <li>Fauna diversity and habitats typical of the region.</li> <li>Baseline fauna surveys identified 24 significant fauna species with potential to utilise the Study Area. Most of these species would be occasional visitors to the Study Area. None of these species are restricted to or reliant on habitat within the Clearing Footprint.</li> <li>Two significant fauna species are known to be residential within the broader Study Area: Malleefowl (<i>Leipoa ocellata</i>) (Vulnerable) and the Inland Hairstreak Butterfly (<i>Jalmenus arctus</i>) (Priority 1). All conservation significant habitat for these species has been excised from the Clearing Footprint.</li> </ul>	<p><b>Avoid</b></p> <ul style="list-style-type: none"> <li>Significant fauna habitat was excised from the Clearing Footprint, including:       <ul style="list-style-type: none"> <li>All Malleefowl breeding habitat and nesting mounds.</li> <li>All Inland Hairstreak Butterfly locations and a 50 m buffer have been excised from the Clearing Footprint.</li> </ul> </li> </ul> <p><b>Minimise</b></p> <ul style="list-style-type: none"> <li>Clearing will be minimised to the amount necessary.</li> <li>Undertake land clearing in a manner that allows fauna to migrate into adjacent areas and retains landscape connectivity.</li> <li>Use designated access road and tracks and limit unnecessary vehicle movement.</li> <li>Restrict vehicle speeds to a maximum of 40 km/hr on unsealed roads to reduce dust generation during construction.</li> <li>Dust suppression implemented to minimise potential indirect impacts from fugitive emissions.</li> <li>Noise and vibration will be minimised as far as practicable.</li> <li>Vehicle hygiene protocols to be implemented to prevent introduction of meat ants into the Clearing Footprint.</li> <li>Surface water drainage to be maintained with appropriate surface water management infrastructure.</li> <li>Clearing of high potential SRE habitat (drainage lines) will be minimised</li> </ul> <p><b>Rehabilitate</b></p> <ul style="list-style-type: none"> <li>Progressive rehabilitation in accordance with a mine closure plan approved under the Mining Act.</li> </ul>	<p><b>Not likely to be at variance</b></p> <ul style="list-style-type: none"> <li>The Proposal will require clearing 621 ha of fauna habitats that are common and widespread in the Study Area and surrounding region.</li> <li>Potential impacts to Malleefowl are not likely to be significant.       <ul style="list-style-type: none"> <li>No clearing of Malleefowl breeding habitat or nesting mounds is proposed.</li> <li>Up to 621 ha of Malleefowl foraging and/or dispersal habitat will be cleared. These habitats are common and widespread throughout the Study Area and surrounding area. The proposed clearing will only reduce the available Malleefowl habitat within the region by 0.08%.</li> </ul> </li> <li>Potential impacts to IHB are not likely to be significant.       <ul style="list-style-type: none"> <li>No clearing of IHB breeding shrubs (and a 50 m protective buffer) is proposed.</li> <li>Additional controls will be implemented to ensure potential impacts to IHB are ALARP e.g. hygiene protocols to prevent introduction of meat ants, dust suppression, maintenance of surface water drainage etc.</li> </ul> </li> <li>Potential for short-ranged endemic fauna was also considered and clearing of high potential SRE habitat will be minimised. High potential SRE habitat corresponds with drainage lines. Clearing these habitats will be minimised as far as practicable. It is anticipated that up to 20 ha of this habitat type will require clearing, which represent about 3.2% of the high potential SRE habitat in the Study Area. Given the low proportion of high potential SRE habitat requiring clearing, it is unlikely the Proposal will have a significant impact on SRE fauna.</li> <li>Potential fauna interactions, disturbance and degradation of fauna habitat associated with vegetation clearing will be ALARP with the proposed mitigations.</li> </ul>
<p><b>(c) Native vegetation should not be cleared if it includes, or is necessary for, the</b></p>	<ul style="list-style-type: none"> <li>No Threatened flora species listed under the BC Act or EPBC Act have been recorded within the Clearing Footprint or broader Study Area.</li> </ul>	<p><b>Avoid</b></p> <ul style="list-style-type: none"> <li>No Threatened flora known to occur in Study Area, therefore all Threatened flora species have been avoided.</li> </ul>	<p><b>Not at variance</b></p> <ul style="list-style-type: none"> <li>No Threatened flora species have been recorded in the Clearing Footprint or the broader Study Area, therefore any potential impacts to rare flora have been avoided.</li> </ul>

Clearing Principle	Receiving Environment	Mitigation Measures Adopted	Variance Level with Mitigation Measures / Justification
<p>continued existence of rare flora.</p> <p><b>Principle (d)</b> 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.</p>	<ul style="list-style-type: none"> <li>No TECs listed under the BC Act or EPBC Act have been recorded within the Clearing Footprint or broader Study Area.</li> </ul>	<p><b>Avoid</b></p> <ul style="list-style-type: none"> <li>No TECs or PECs known to occur in Study Area, therefore all TECs and PECs have been avoided.</li> </ul>	<p><b>Not at variance</b></p> <ul style="list-style-type: none"> <li>No TECs have been recorded in the Clearing Footprint or the broader Study Area, therefore any potential impacts to TECs have been avoided.</li> </ul>
<p><b>Principle (e)</b> Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.</p>	<ul style="list-style-type: none"> <li>Clearing Footprint does not comprise a significant remnant. Clearing Footprint lies within a relatively intact landscape, characterised by relatively contiguous vegetation.</li> <li>Three vegetation associations occur within the Clearing Footprint:                             <ul style="list-style-type: none"> <li>20: Low woodland; mulga mixed with <i>Allocasuarina cristata</i> and <i>Eucalyptus</i> spp.</li> <li>468: Medium woodland; salmon gum and goldfields blackbutt</li> <li>1294: Low woodland; mulga mixed with <i>Allocasuarina cristata</i> and <i>Eucalyptus</i> spp.</li> </ul> </li> </ul>	<p><b>Avoid</b></p> <ul style="list-style-type: none"> <li>No clearing of significant remnant vegetation proposed. Clearing Footprint lies within a relatively intact landscape characterised by contiguous vegetation.</li> </ul> <p><b>Minimise</b></p> <ul style="list-style-type: none"> <li>Clearing will be minimised to the amount necessary.</li> </ul> <p><b>Rehabilitate</b></p> <ul style="list-style-type: none"> <li>Progressive rehabilitation in accordance with a mine closure plan approved under the Mining Act.</li> </ul>	<p><b>Not at variance</b></p> <p>Clearing will not reduce the extent of any vegetation associations below the 30% threshold for conservation. Over 96% of these vegetation associations will be retained at local and State level.</p>
<p><b>Principle (f)</b> Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.</p>	<ul style="list-style-type: none"> <li>No permanent or semi-permanent wetlands are mapped or recorded within the Clearing Footprint.</li> <li>Several minor, ephemeral drainage lines occur within the Clearing Footprint. These are typically defined by subtle depressions or shallow channels.</li> <li>Ephemeral watercourses do not support riparian vegetation distinct from the surrounding landscape, nor do they support water-dependent ecosystems. There are no groundwater-dependent ecosystems (GDEs) identified during flora and vegetation surveys.</li> </ul>	<p><b>Avoid</b></p> <ul style="list-style-type: none"> <li>The primary watercourse has been avoided.</li> </ul> <p><b>Minimise</b></p> <ul style="list-style-type: none"> <li>Clearing will be minimised to the amount necessary.</li> <li>Clearing within drainage lines will be minimised as far as practicable.</li> </ul> <p><b>Rehabilitate</b></p> <ul style="list-style-type: none"> <li>Progressive rehabilitation in accordance with a mine closure plan approved under the Mining Act.</li> </ul>	<p><b>May be at variance</b></p> <p>Several minor, ephemeral drainage lines occur within the Clearing Footprint. These are typically defined by subtle depressions or shallow channels. These features do not support riparian vegetation distinct from the surrounding landscape, nor do they support water-dependent ecosystems. Vegetation in these areas is consistent with the broader vegetation units (e.g. <i>Eucalyptus</i> and <i>Casuarina</i> woodlands, shrublands) and does not exhibit structural or floristic characteristics typical of wetland or riparian environments. Given the nature of the ephemeral waterways, clearing along drainage lines cannot be avoided altogether, but will be minimise as far as practicable.</p>
<p><b>Principle (g)</b> Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.</p>	<ul style="list-style-type: none"> <li>Risk pathways for land degradation are expected to be typical of development in the Goldfield region</li> <li>The local environment is dry and potential fugitive dust will need to be mitigated and managed.</li> <li>Rainfall is typically low and seasonal rainfall is unpredictable. Stochastic large rainfall events can occur, and topsoil management should be managed to prevent sedimentation causing land degradation.</li> <li>Soils within the Clearing Footprint are not prone to erosion or dispersion and potential dust and sedimentation could be achieved with standard industry practices for dust and soil management.</li> </ul>	<p><b>Minimise</b></p> <ul style="list-style-type: none"> <li>Clearing will be minimised to the amount necessary.</li> <li>Steep land clearing to minimise exposure of surface where practicable.</li> <li>Restrict vehicle speeds to a maximum of 40 km/hr on unsealed roads during construction to reduce dust generation.</li> <li>Use designated access road and tracks and limit unnecessary vehicle movement emissions.</li> <li>Dust suppression implemented to minimise potential indirect impacts from fugitive emissions.</li> <li>Ensure cleared areas are progressively stabilised or rehabilitated</li> <li>Surface water drainage to be maintained with appropriate surface water management infrastructure.</li> </ul> <p><b>Rehabilitate</b></p> <ul style="list-style-type: none"> <li>Progressive rehabilitation in accordance with a mine closure plan approved under the Mining Act.</li> </ul>	<p><b>Not likely to be at variance</b></p> <p>There are no characteristics of the local environment that suggest vegetation within the Clearing Footprint would be particularly susceptible to degradation. For example, soil testing and analysis has shown the soils are relatively stable. However, the Goldfields experiences a dry climate with unpredictable rainfall, accordingly wind and water-borne erosion will need to be managed. This will be mitigated with the application of standard industry practices for dust and surface water management.</p>
<p><b>Principle (h)</b> 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.</p>	<ul style="list-style-type: none"> <li>No conservation areas are located within or adjacent to the Clearing Footprint.</li> <li>The nearest conservation area is Kalgoorlie Arboretum (3.8 km west).</li> </ul>	<p><b>Avoid</b></p> <ul style="list-style-type: none"> <li>All conservation areas have been avoided with sufficient separation distance.</li> </ul>	<p><b>Not at variance</b></p> <p>The Clearing Footprint is not located within or adjacent to any conservation reserves. The nearest conservation reserve is the Kalgoorlie Arboretum, located 3.8 km west of the Clearing Footprint. The closest ESA is located approximately 53.5 km north-west of the Clearing Footprint. Given the separation distances between the Clearing Footprint and these conservation areas, the proposed clearing is not expected to impact the environmental values of any adjacent or nearby conservation area.</p>

**Kalgoorlie Regional Renewable Energy Project**  
NVCP Supporting Document

Clearing Principle	Receiving Environment	Mitigation Measures Adopted	Variance Level with Mitigation Measures / Justification
<p><i>Principle (i) Native vegetation should not be cleared if the clearing of native vegetation is likely to cause deterioration in the quality of surface or underground water.</i></p>	<ul style="list-style-type: none"> <li>No permanent watercourses or wetland occur within the Clearing Footprint or adjacent areas.</li> <li>Several ephemeral drainages intersect the Clearing Footprint. These water courses drainage towards an ephemeral salt lake located about 12 km northwest of the Clearing Footprint.</li> <li>Groundwater infiltration is low due to the nature of the underlying geology. The standing water level is approximately 35 mbgl and interactions with groundwater are unlikely.</li> <li>Water quality in the salt lakes and groundwater aquifers is typically hypersaline.</li> </ul>	<p><b>Avoid</b></p> <ul style="list-style-type: none"> <li>Permanent surface water features have been avoided.</li> <li>Groundwater will not be intercepted.</li> </ul> <p><b>Minimise</b></p> <ul style="list-style-type: none"> <li>Clearing will be minimised to the amount necessary.</li> <li>Clearing within drainage lines will be minimised as far as practicable.</li> <li>Surface water drainage to be maintained with appropriate surface water management infrastructure.</li> <li>Stockpile excess material away from drainage paths.</li> <li>Install sediment controls in areas at risk of sediment laden runoff entering water systems.</li> </ul> <p><b>Rehabilitate</b></p> <ul style="list-style-type: none"> <li>Progressive rehabilitation in accordance with a mine closure plan approved under the Mining Act.</li> </ul>	<p><b>Not at variance</b></p> <p>Deterioration of water quality is unlikely given there are no nearby permanent surface water features, the water table is typically deep (35 mbgl) and infiltration of rainfall is extremely low due to the underlying geology.</p>
<p><i>Principle (i) Native vegetation should not be cleared if the clearing of native vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.</i></p>	<ul style="list-style-type: none"> <li>Flood modelling shows several ephemeral drainages intersect the Clearing Footprint, however these water courses are not prone to flooding with the 1% AEP base flood depth typically 0.3 m and flood velocity &lt;1 m/s.</li> <li>These drain into a larger main ephemeral watercourse along the eastern boundary of the Clearing Footprint.</li> </ul>	<p><b>Avoid</b></p> <ul style="list-style-type: none"> <li>Permanent surface water features have been avoided.</li> </ul> <p><b>Minimise</b></p> <ul style="list-style-type: none"> <li>Clearing will be minimised to the amount necessary.</li> <li>Clearing within drainage lines will be minimised as far as practicable.</li> <li>Surface water drainage to be maintained with appropriate surface water management infrastructure.</li> </ul> <p><b>Rehabilitate</b></p> <ul style="list-style-type: none"> <li>Progressive rehabilitation in accordance with a mine closure plan approved under the Mining Act</li> </ul>	<p><b>Not at variance</b></p> <p>The proposed Clearing Footprint has avoided flood prone areas. The surface water assessment conducted for the Proposal determined that surface water drainage can be adequately managed with the proposed mitigation measures.</p>

## CONTENTS

<b>Executive Summary .....</b>	<b>ii</b>
<b>1 Proposal Description .....</b>	<b>5</b>
1.1 Background .....	5
1.2 Proposed Clearing .....	7
<b>2 Receiving Environment .....</b>	<b>9</b>
2.1 Climate .....	9
2.2 Bioregion .....	9
2.3 Social Surroundings .....	10
2.4 Terrestrial Environmental Quality .....	12
2.5 Inland Waters .....	13
2.6 Flora and Vegetation .....	14
2.7 Terrestrial Fauna .....	25
<b>3 Clearing Assessment .....</b>	<b>38</b>
3.1 Principle (a) .....	38
3.2 Principle (b) .....	39
3.3 Principle (c) .....	40
3.4 Principle (d) .....	40
3.5 Principle (e) .....	40
3.6 Principle (f) .....	41
3.7 Principle (g) .....	41
3.8 Principle (h) .....	41
3.9 Principle (i) .....	42
3.10 Principle (j) .....	42
<b>4 Environmental Management .....</b>	<b>43</b>
4.1 Avoid .....	43
4.2 Minimise .....	44
4.3 Rehabilitate .....	45
4.4 Offset .....	45
<b>5 Environmental Management System .....</b>	<b>46</b>
<b>6 References .....</b>	<b>47</b>
<b>7 Appendices .....</b>	<b>49</b>

**LIST OF PLATES**

Plate 2-1 Annual Climate and Weather Data for Kalgoorlie-Boulder Airport..... 9  
 Plate 2-2: 1% AEP Surface Water Flows (AQ2 2025)..... 14

**LIST OF FIGURES**

Figure 1-1: Location..... 6  
 Figure 1-2: Clearing Footprint..... 8  
 Figure 2-1 Land Use ..... 11  
 Figure 2-2 Vegetation Types ..... 19  
 Figure 2-3 Vegetation Condition..... 21  
 Figure 2-4 Significant Flora..... 24  
 Figure 2-5 Fauna Habitat..... 27  
 Figure 2-6 Malleefowl Habitat ..... 33  
 Figure 2-7 Short Range Endemic Habitat..... 37

**LIST OF TABLES**

Table ES-1: NVCP Summary..... ii  
 Table ES-2 Summary Clearing Assessment..... iv  
 Table 1-1: Mining Tenements ..... 7  
 Table 1-2: Other Tenure ..... 7  
 Table 2-1: Land Systems (DPIRD-064) ..... 12  
 Table 2-2: Flora and Vegetation Studies ..... 16  
 Table 2-3: Pre-European Vegetation Associations..... 17  
 Table 2-4: Representation of pre-European Vegetation Associations (GoWA, 2019). ..... 17  
 Table 2-5: Vegetation Types..... 18  
 Table 2-6: Vegetation Condition ..... 20  
 Table 2-7: Terrestrial Fauna Studies ..... 25  
 Table 2-8: Fauna Habitat ..... 26  
 Table 2-9: Fauna Species Summary (Phoenix 2025) ..... 28  
 Table 2-10: Significant Fauna Likelihood and WTG Risk Assessment ..... 29  
 Table 2-11: Malleefowl Habitat Suitability ..... 32  
 Table 2-12: Regional Malleefowl Habitat ..... 34  
 Table 2-13: Short Range Endemic Habitat Potential ..... 35  
 Table 2-14: Potential SRE Species within DE..... 36  
 Table 4-1: Minimisation Measures..... 44

**LIST OF APPENDICES**

Appendix A Proof of Ownership & Landholder Authorisation..... 50  
 Appendix B Surface Water Assessment ..... 53  
 Appendix C Detailed Flora and Vegetation Survey..... 54  
 Appendix D Reconnaissance Flora and Vegetation Survey (2024)..... 55  
 Appendix E Reconnaissance Flora and Vegetation Survey (2022)..... 56  
 Appendix F Basic and Targeted Fauna Survey (2025)..... 57  
 Appendix G Targeted Butterfly Survey (CONFIDENTIAL)..... 58  
 Appendix H Targeted Malleefowl Survey (2025)..... 59  
 Appendix I Malleefowl LiDAR Assessment (Part A)..... 60  
 Appendix J Malleefowl LiDAR Assessment (Part B)..... 61  
 Appendix K Bird and Bat Risk Assessment..... 62  
 Appendix L Environmental Management Plan (CONFIDENTIAL)..... 63  
 Appendix M Butterfly Impact Assessment (CONFIDENTIAL) ..... 64  
 Appendix N EPBC Act Self-Assessment..... 65

## GLOSSARY

Abbreviation / Acronym	Definition
ABAB	Arid Bronze Azure Butterfly
ALARP	As low as reasonably practicable
BC Act	<i>Biodiversity and Conservation Act 2016</i>
BoM	Bureau of Meteorology
CEC	Cation Exchange Capacity
CKB	City of Kalgoorlie-Boulder
DBCA	Department of Biodiversity, Conservation and Attractions
DES	Donato Environmental Services
DMPE	Department of Mines, Petroleum and Exploration
DPIRD	Department of Primary Industries and Regional Development
DWER	Department of Water and Environmental Regulation
EMP	Environmental Management Plan
EMS	Environmental Management System
EPA	Environmental Protection Authority
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
ESA	Environmentally Sensitive Areas
GDE	Groundwater Dependent Ecosystem
IBSA	Index of Biodiversity Surveys for Assessments
IHB	Inland Hairstreak Butterfly
KCGM	Kalgoorlie Consolidated Gold Mine
Northern Star	Northern Star Resources Ltd
NVCP	Native Vegetation Clearing Permit
PEC	Priority Ecological Communities
Phoenix	Phoenix Environmental Services
SRE	Short-Range Endemic
TEC	Threatened Ecological Communities
WTG	Wind turbine generator



## **1 Proposal Description**

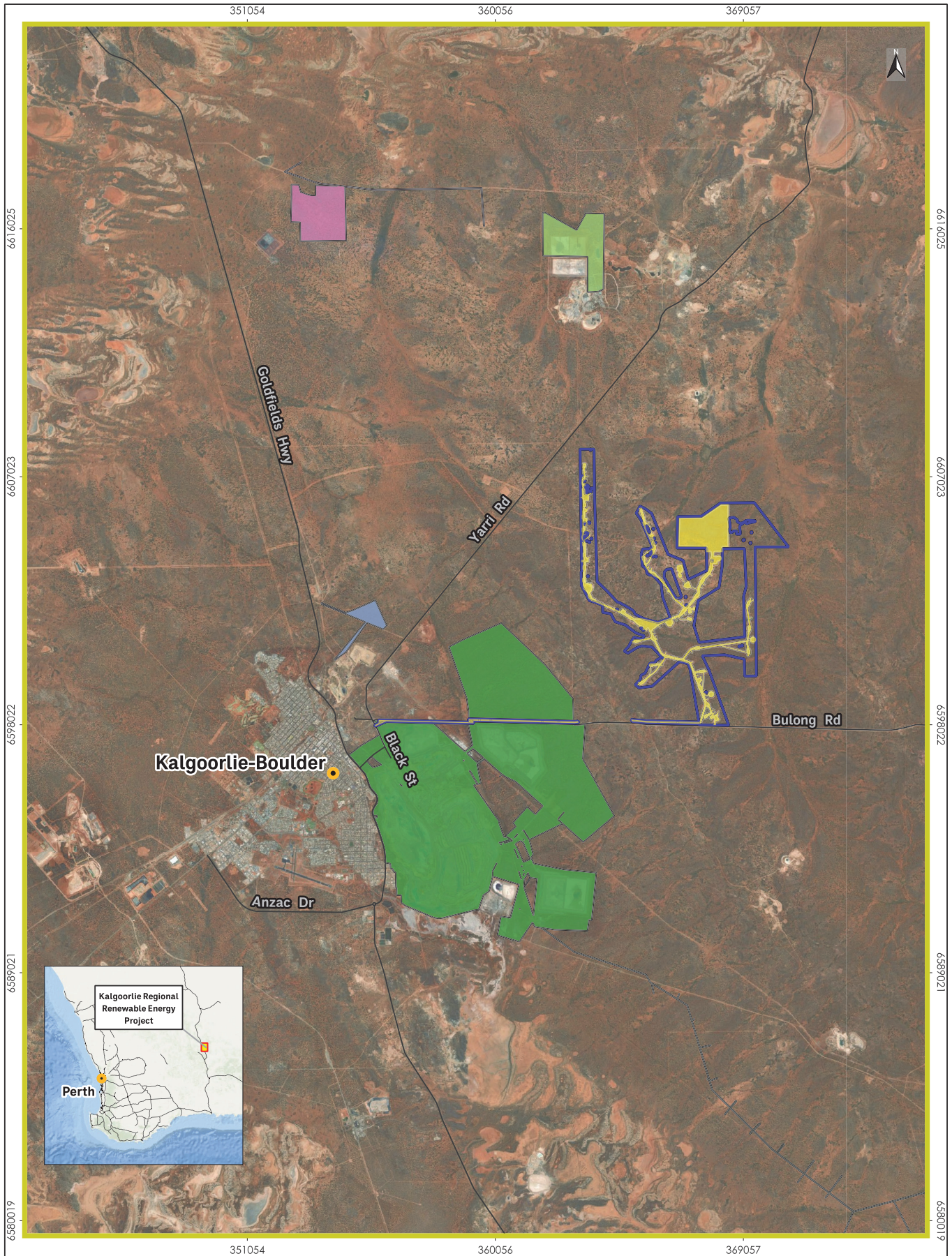
### **1.1 Background**

The Proposal comprises a 260 MW<sub>AC</sub> wind farm and a 110 MW<sub>AC</sub> solar farm proposed approximately 10 km northeast of the Kalgoorlie-Boulder townsite. Proposed infrastructure includes up to 32 wind turbines, solar arrays, battery energy storage systems (BESS), substations, transmission lines and supporting facilities.

On 12 November 2025 the Proposal was referred to the Environmental Protection Authority (EPA) for consideration under s38 of Part IV of the *Environmental Protection Act 1986* (EP Act). On 17 December 2025 the EPA determined the Proposal would not require assessment under Part IV of the EP Act and that potential impacts from native vegetation clearing could be managed via a native vegetation clearing permit granted under Part V Division 2 of the EP Act.

Taking into consideration Part V Division 2 of the EP Act, the *Environmental Protection Regulations 1987* (EP Regulations), and the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004* (Clearing Regulations), the EPA acknowledged the following:

- Construction of the Proposal requires clearing up to 652 ha of native vegetation which will result in loss of:
  - 0.5 ha of one locally significant vegetation type
  - 302.5 ha of vegetation that is potentially suitable habitat for *Eremophila praecox* (listed as P2 by DBCA)
  - up to two individuals of *Streptoglossa cylindriceps* (unlisted –potential range extension) which is widely distributed throughout Western Australia, South Australia and Northern Territory
- Given the EPA’s decision to ‘not assess’ this proposal under Part IV of the EP Act, the project will require a NVCP under Part V, Division 2 of the EP Act. The NVCP application may be assessed by DWER or by DMPE as per the Memorandum of Understanding (MoU) between the departments. Exemptions under the Clearing Regulations may apply where granting of tenements is pending.
- In assessing the NVCP application, DWER will consider how the proponent has applied the mitigation hierarchy and the 10 Clearing Principles outlined in the EP Act, and whether any conditions should be prescribed to manage potential impacts.



# Proposal Location

Figure 1-1

- |                    |   |
|--------------------|---|
| Clearing Footprint | <b>Northern Star Resources Operations</b> |
| Proposed Clearing  | Kanowna Belle Clearing Permit             |
| Town/City          | Fimiston South                            |
| Roads              | Crossroads                                |
|                    | Regional Core Yard                        |



## 1.2 Proposed Clearing

The Proposal will require up to 652 ha of land to be cleared within a 2,312 ha Development Envelope. Most of the clearing (621 ha) is proposed to be conducted using a native vegetation clearing permit (NVCP) (this application). A small proportion of clearing (up to 21.5 ha) is proposed to be conducted under clearing permit exemptions (Regulation 5, Item 20) for pending tenements associated with site access and services, as pending tenements cannot be included in a NVCP application. The remaining 10 ha of land disturbance is proposed within previously cleared land that will not require clearing of native vegetation.

This NVCP application seeks approval to clear up to 621 ha of native vegetation within an approximately 2,264 ha Clearing Footprint. The Clearing Footprint lies predominantly within mining tenements held by Northern Star (Table 1-1). A small portion of the Clearing Footprint lies within a road reserve managed by the City of Kalgoorlie-Boulder (CKB). Northern Star has obtained to authorisation from the CKB to seek an NVCP for the works propose within Lot 428 on Plan P028432 (Table 1-2). Proof of ownership and landholder authorisation in attached in Appendix A.

**Table 1-1: Mining Tenements**

Tenement Number	Tenement Area (ha)	Expiry	Holder 1	Holder 2
L 26/297	68.96	23/10/2044	Northern Star (KLV) Pty Ltd (50%)	Northern Star (Saracen Kalgoorlie) Pty Ltd (50%)
M 26/383	653.45	16/07/2034		
M 26/489	174.85	5/10/2030		
M 26/495	774.90	5/10/2030		
M 26/496	886.40	5/10/2030		
M 26/503	110.15	15/10/2030		
M 26/577	238.00	28/08/2033		
M 26/625	94.00	28/08/2033		
M 26/646	16.02	28/08/2033		
G 27/3	2,335.34	12/08/2045		
G 27/4	2,615.91	12/08/2045	Resources Ltd	

**Table 1-2: Other Tenure**

Lot Number	Plan	Land Type	Landholder
Lot 428	P028432	Road	City of Kalgoorlie-Boulder

# Clearing Footprint

Figure 1-2

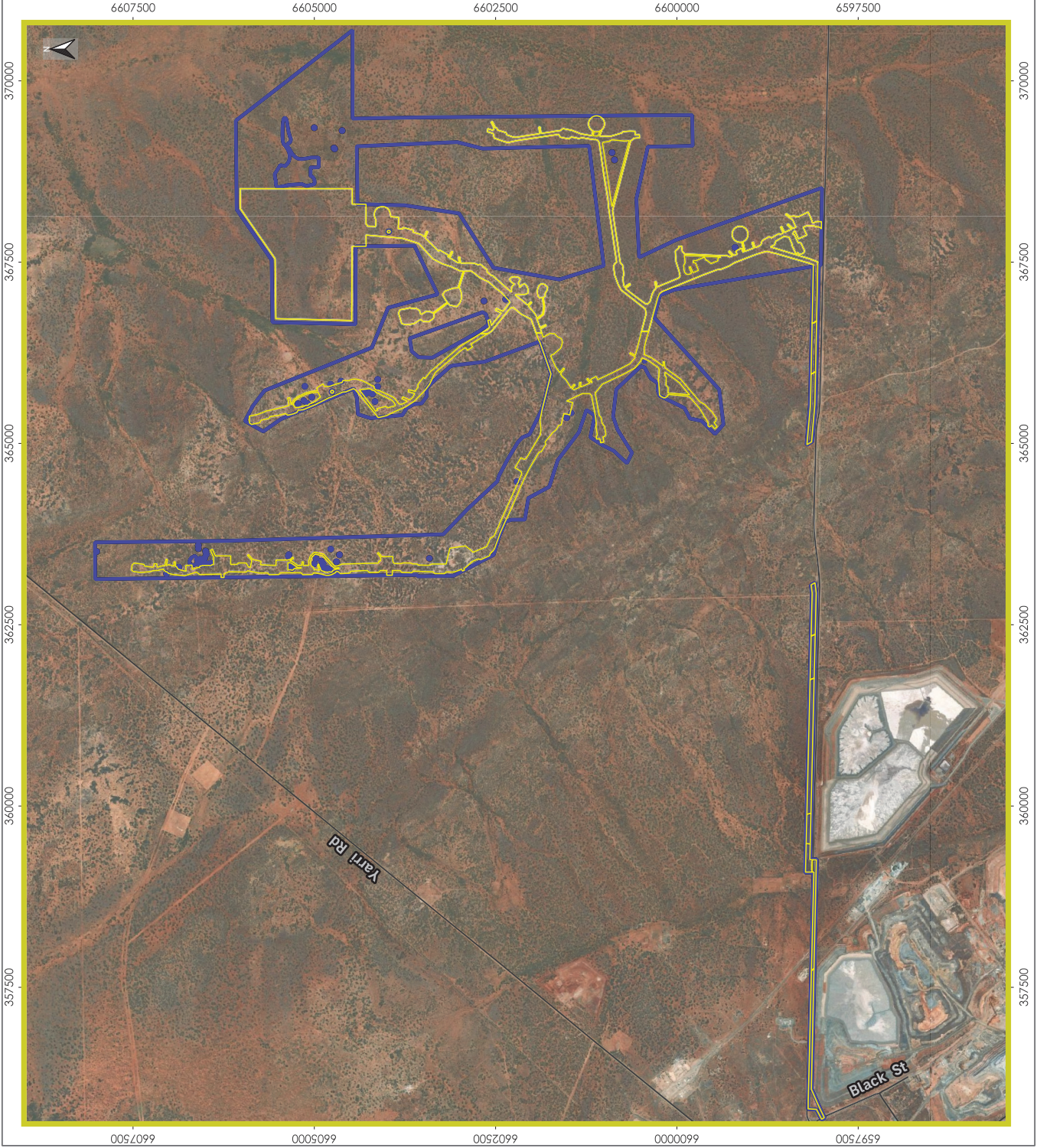
- Clearing Footprint
- Proposed Clearing
- Roads



Scale: 75000  
Date: 5/12/2025  
Author: McDonald, Lochlan R.  
Coordinate System: GDA2020 / MGA zone 51



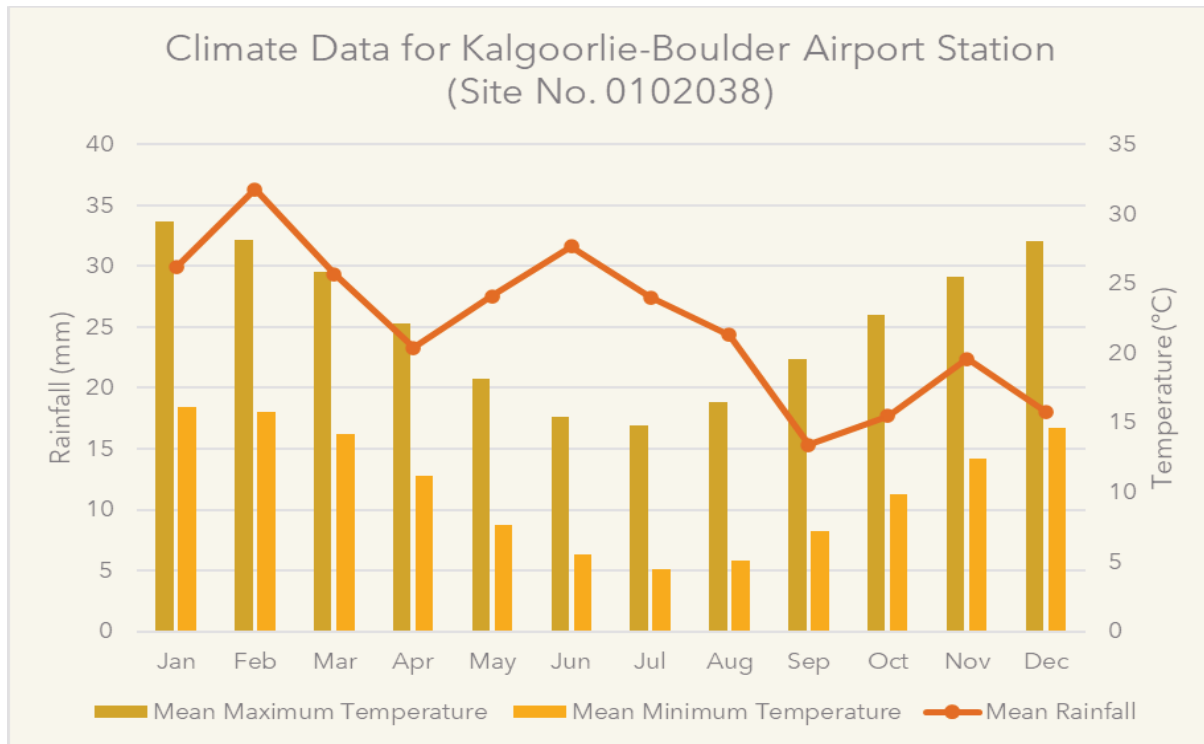
NORTHERN STAR  
RESOURCES LIMITED



## 2 Receiving Environment

### 2.1 Climate

The City of Kalgoorlie-Boulder is situated within the Eastern Goldfields subregion which experiences an arid to semi-arid climate, receiving 200-300 mm of rainfall annually, typically in winter but occasionally in summer (Cowan 2001a). The closest Bureau of Meteorology (BoM) weather station is Kalgoorlie-Boulder Airport (no. 012038), located 6 km southwest of the Clearing Footprint. Kalgoorlie-Boulder Airport records the highest mean maximum monthly temperature of 33.7°C in January and the lowest in July at 16.9°C. The lowest mean minimum monthly temperature is 5.1°C in July, while the highest is 18.4°C in January (BoM, 2025). The mean annual rainfall is 265.7 mm, with July and June having the highest monthly medians of 20.0 mm and 19.6 mm, respectively (Figure 3 1).



**Plate 2-1 Annual Climate and Weather Data for Kalgoorlie-Boulder Airport**

### 2.2 Bioregion

The Proposal occurs within two subregions:

- The East Murchison subregion, as described by (Cowan, 2001b), features internal drainage, elevated red desert sandplains with minimal dune development, and salt lake systems linked to an occluded Paleodrainage system. The landscape includes broad plains of red-brown soils, breakaway complexes, and red sandplains. Vegetation is primarily composed of Mulga woodlands, often with rich ephemeral species, along with hummock grasslands, saltbush shrublands, and Halosarcia (Tecticornia) shrublands.
- The Eastern Goldfields subregion is characterised by subdued relief, with undulating plains and low hills, as well as a horst in the east. It contains playa lakes associated with remnants of an ancient drainage line, and is dominated by calcareous earths, especially over plains and greenstone areas. The vegetation includes a mix of Mallees, Acacia thickets, shrubland heaths, Eucalyptus woodlands, and dwarf samphire shrublands (Cowan, 2001b).

## **2.3 Social Surroundings**

### 2.3.1 Land Use

The Clearing Footprint is located within the 'extensive land use zone' (GoWA, 2022).

The Clearing Footprint is located adjacent to the Kalgoorlie-Boulder townsite, the largest population centre in the Goldfields region, home to 29,306 people (ABS, 2021). Dominant land uses in the CKB include mining, pastoralism, recreation, unallocated crown land, conservation reserves, and Aboriginal traditional uses. The Proposal is situated on the Mt Burges pastoral station, owned by Northern Star. Surrounding pastoral leases include Hampton Hill station, and Mt Vettters station. The Hampton Hill homestead is located approximately 12 km east of the Clearing Footprint.

The Clearing Footprint is bounded by Yarri Road to the northwest and Bulong Road to the south, both local roads managed by CKB. Nearby notable locations include the Ninga Mia Aboriginal Community (450m), Kanowna Cemetery (2.4 km) and Yarri Road Refuse Facility (2.8 km). The Clearing Footprint overlies with two reserves: R8767 (unvested) and R35662 (vested CKB, consent to mine granted), and is adjacent to R35264 (unvested). Surrounding land uses are shown in Figure 2-1.

The Clearing Footprint is zoned "Rural" under the CKB Local Planning Scheme (LPS) No.2. Whilst the Proposal is situated predominantly on Mining Tenure, the Proposal is broadly compatible with the Rural zone and meets the objective of "to provide for a range of non-rural land uses where they have demonstrated benefit and are compatible with surrounding rural land use."

No environmentally sensitive areas (DWER-046) or legislated lands and waters (DBCA-011) are located within the Clearing Footprint. The nearest environmentally sensitive area is located approximately 66 km northeast of the Clearing Footprint, and nearby conservation reserves include Kalgoorlie Arboretum (3.8 km west), Lakeside Timber Reserve (6.0 km south) and Bullock Holes Timber Reserve (15.6 km northeast) (Figure 2-1). The Clearing Footprint intersects several Schedule 1 Areas (DWER-057) adjacent to and intersecting Bulong road.
















### 2.3.2 Native Title

The Marlinyu Ghoorlie Claim (WC2017/007), which was accepted for registration on 28 March 2019, covers the entire Clearing Footprint. On 19 December 2025, the Federal Court of Australia recognised the Marlinyu Ghoorlie Native Title Claimant Group's ongoing connection to the land and waters within the claim area, and the claim will progress to determination through case management.

Granting of mining tenure under the *Mining Act 1978* is a future act under the *Native Title Act 1993*, which is considered an activity or development that could affect Native Title (i.e. by creating interests that are inconsistent with Native Title). Registered Native Title Claimants are referred applications for mining tenure via future act procedures, which requires negotiation between parties on the granting of tenure. As noted above, all pending tenure included in the Clearing Footprint falls within the registered Marlinyu Ghoorlie Claim (WC2017/007) area. Northern Star is party to a land use agreement with the applicants for the Marlinyu Ghoorlie Native Title Claim and considers that the pending tenure included in the Clearing Footprint sits within the consents given under that land use agreement.

# Surrounding Land Use

Figure 2-1

-  Development Envelope
-  Clearing Footprint
-  Environmentally Sensitive Areas (ESAs)
-  Priority Threatened Ecological Communities (TECs) (DBCA-038)
-  Pastoral Stations (DPLH-083)
-  Clearing Regulations Schedule One Areas (DWER-057)
-  Legislated Lands and Waters (DBCA-011)
-  National Park
-  Nature Reserve
-  Conservation Park
-  Section 5(1)(g) Reserve
-  Section 5(1)(h) Reserve
-  State Forest
-  Timber Reserve
-  Crown Land - Section 33(2)



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0 5 10 15 km

Scale: 800000  
Date: 11/2/2026  
Author: McDonaid, Lochlan R.  
Coordinate System:  
GDA2020 / MGA zone 51



## 2.4 Terrestrial Environmental Quality

Land system mapping in Western Australia is conducted by the Department of Primary Industries and Regional Development (DPIRD) using a nested soil-landscape hierarchy (Waddell and Galloway, 2024). Under this hierarchy, land systems are defined as areas with recurring patterns of landforms, soils, vegetation, and drainage (Payne and Leighton, 2004). They are used to characterise the physical and ecological diversity of landscapes at a regional scale.

The Clearing Footprint intersects four mapped land systems typical of the broader bioregion (Table 2-1). The Gumland System is the most extensive both locally and regionally.

**Table 2-1: Land Systems (DPIRD-064)**

Land system	Description	Clearing Footprint (ha)	Regional area (ha)	% of land system in Clearing Footprint
Gumland System	Extensive pedeplains supporting eucalypt woodlands with halophytic and non-halophytic shrub understoreys.	1,370.78	96,650	1.42
Kanowna System	Erosional and depositional surfaces with extensive very gently inclined to gently undulating saline stony plains supporting scattered eucalypt woodland and halophytic shrublands.	743.94	13,515	5.50
Kurrawang System	Low hills and ridges, with occasional plateaus and scarps, and undulating stony plains, on metasedimentary and felsic volcanoclastic rocks, supporting scattered eucalypt or casuarina woodlands	12.45	3,019	0.41
Zed System	Low hills, rises and gently undulating stony plains based on metasedimentary rocks supporting Acacia shrublands	136.38	1,639	8.32
Total		2,263.54	114,823	

### 2.4.1 Geology

The geology of the Eastern Goldfields is characterised by north-northwest trending Archaean aged Greenstone belts. The Greenstones consist of metamorphosed volcanic and sedimentary rocks. The areas between the Greenstone belts are occupied by granites. Younger Proterozoic aged dolerite dykes cut through the granites and Greenstones. Mesozoic aged glaciation formed extensive valley systems which were later filled with Tertiary sediments. These sediments have formed paleochannels, which are now buried by today's surface sediments.

### 2.4.2 Soils

#### Physical Properties

Soils across the Clearing Footprint are red to reddish brown and are comprised of loam and clay with pockets of silt and sand throughout. Soils within the topsoil are highly weathered and are predominantly clay based with organic root system material. Subsoil layers also had root systems located sporadically throughout and associated with larger trees.

The topsoil layer consists of fine to coarse material, with gravel present on the surface. The gravel size increases as depth increases with gravel larger than 20 mm encountered at depth. The identified clays present have varying degrees of plasticity, displayed no signs of hydrophobia and are considered wettable. However, a durable crust has formed within the top 20 mm which can reduce rainfall penetration.

Moisture content across the samples analysed was all below 15%, which aligns with higher levels of gravel and loam. Water repellence of the samples was low; however, this may be higher at site as the surface has a semi-durable crust that will potentially slow down water penetration.

Soils tested fall between two Emerson classes, Class 3 and 4, with only eight Class 3 samples which are considered as slakes but will not disperse. The other 19 samples were Class 4 which are primarily stable with moderate cohesion. All soils across the area can be classified as non-dispersive and will be suitable as a rehabilitation medium based on cohesion and stability results.

### Chemical Properties

The pH values indicate a slightly alkaline to strongly alkaline distribution with high levels of metals. High pH levels in conjunction with high clay content and dry conditions indicates that the metals are not mobile and do not have the potential to be mobile.

Cation Exchange Capacity (CEC) across the Clearing Footprint is consistent with soils that have a higher clay fraction. Levels of metals within the soils are common for the region, high levels of S, Fe, Ca, Al, can be contributed to sulphide-rich mineral deposits such as pyrite. These metals are not likely to contaminate the area due to existing weathering and oxidation.

There is a low potential for Acid Sulphate Soils (ASS) to be in the soils within the Clearing Footprint due to neutral pH of soils and a deep weathering profile.

## **2.5 Inland Waters**

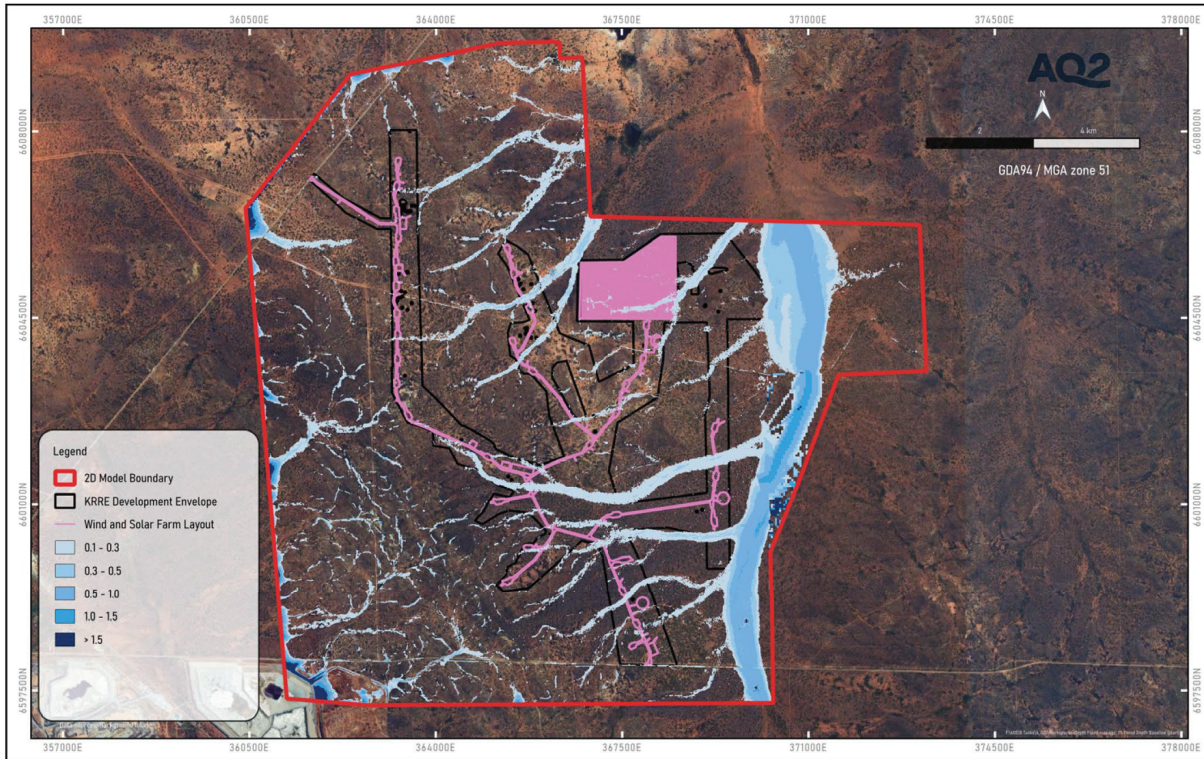
### 2.5.1 Hydrology

Regionally the Proposal is located at the catchment divide between the Raeside-Ponton and Lake Lefroy catchments, with the renewable energy infrastructure located in the Raeside-Ponton catchment area and a small portion of transmission line located within the Lake Lefroy catchment area (DWER 2018). These large regional catchment areas drain internally towards salt lakes and are characterised by numerous poorly defined ephemeral drainage channels which flow following heavy rainfall events.

There are no permanent waterbodies present within the Clearing Footprint. Regionally, permanent surface water is generally limited to larger salt lakes (e.g. Lake Ballard) and anthropogenic sources such as ponds on pastoral stations and mining operations, scattered throughout the broader landscape.

The proposed renewable energy infrastructure will be predominantly sited within one local catchment area which is higher in the west, with ephemeral drainage channels traversing the Clearing Footprint west to east and reporting to a main drainage channel which traverses south to north (AQ2 2025). This main drainage channel discharges towards an ephemeral salt lake system approximately 10 km north of the Clearing Footprint and is not intercepted by any Proposal infrastructure. The Clearing Footprint only represents a portion of flows to this main drainage channel with the inflow boundary to the south of the Clearing Footprint also contributing upstream flows.

Surface water flows within the Clearing Footprint are predominantly concentrated sheet flow within poorly defined ephemeral drainage corridors (AQ2 2025). Flood modelling for the 1% annual exceedance probability event shows most of the Clearing Footprint has less than 0.3 m worst case flooding depth, with the only significant flooding risk (>1 m) in the main drainage channel (Plate 2-5). The surface water assessment for the Proposal is attached as Appendix B.



**Plate 2-2: 1% AEP Surface Water Flows (AQ2 2025).**

### 2.5.2 Hydrogeology

Hydrogeology in the local area is well documented due to extensive investigations associated with the development of the KCGM. Three main types of aquifers occur in the vicinity of the Clearing Footprint:

- Ferricrete and alluvial sedimentary system: composed of sand, gravel and fractured ferricrete within clays layers, occurring typically from 5 to 40 m below ground level.
- Paleochannel systems: a buried network of Tertiary alluvial sands located approximately 60 m below ground level. Groundwater flows from west to east, draining towards Lake Yindarlgooda.
- Fractured bedrock system: Groundwater occurs in fractured and weathered zones of basement rocks, allowing for limited subsurface flow.

There is no known potable groundwater in the Kalgoorlie-Boulder area. Groundwater is brackish to hypersaline, with total dissolved solids reaching up to 200,000 mg/L in nearby monitoring bores. The Proposal involves only shallow surface disturbance, with excavation limited to less than 5 m per turbine footing, and groundwater is typically 35 mbgl. As such, there will be no interaction with groundwater resources from proposal related activities.

### 2.6 Flora and Vegetation

Studies have been conducted in accordance with EPA technical guidance (EPA 2016) to understand the Flora and Vegetation within the Clearing Footprint (2,264 ha) and broader Study Area (13,193 ha). The Proposal is situated on the boundary of botanical provinces which have different recommended primary survey timing according to the EPA technical guidance:

- Eremaean: 6-8 weeks post wet season (march June)
- South-West Interzone: (September-November)

Given the Goldfields' low and unpredictable rainfall, surveys were undertaken across multiple seasons, including spring and autumn to ensure adequate seasonal coverage and capture of ephemeral species.

Overall, the combined survey effort, including the detailed, reconnaissance, and regional assessments across multiple seasons, provides a robust and adequate dataset to support the impact assessment for the Proposal. All Flora and Vegetation studies are attached as appendices, have been submitted to the Index of Biodiversity Surveys for Assessments (IBSA) and are summarised in Table 2-2.

Further regional context of flora and vegetation is also provided by flora and vegetation surveys conducted by KCGM to support planning and approvals for Fimiston Operations (Phoenix 2020; Phoenix 2023) which have been considered as useful for regional context but are not discussed in detail.

**Table 2-2: Flora and Vegetation Studies**

Study	Survey Area	Survey Type	Fieldwork Season	Limitations	IBSA Number
Phoenix 2025a <b>Appendix C</b>	Clearing Footprint excluding transmission line (2,295 ha)	Detailed flora and vegetation survey including: <ul style="list-style-type: none"> <li>• Surveying of 58 quadrats (20 m x 20 m) across representative vegetation types</li> <li>• Targeted flora searches for significant flora, declared pests and weeds of national significance</li> <li>• Vegetation type and condition mapping at 1:10,000 scale</li> <li>• Significant vegetation assessment including threatened, priority and locally significant vegetation</li> </ul>	March 2025 (Primary Eremaean)	Very minor limitations associated with vehicle access (areas traversed on foot)	IBSA-2025-0476
Phoenix 2024a <b>Appendix D</b>	Study Area (partial) (1,776 ha)	Reconnaissance flora and vegetation survey including: <ul style="list-style-type: none"> <li>• Surveying of 51 relevés across representative vegetation types</li> <li>• Targeted flora searches for significant flora, declared pests and weeds of national significance</li> <li>• Vegetation type and condition mapping at 1:10,000 scale</li> </ul>	March 2024 (Primary Eremaean)	No limitations identified	IBSA-2025-0475
Phoenix 2022 <b>Appendix E</b>	Study Area (partial) (11,413 ha)	Reconnaissance flora and vegetation survey including: <ul style="list-style-type: none"> <li>• Surveying of 52 relevés across representative vegetation types</li> <li>• Targeted flora searches for significant flora, declared pests and weeds of national significance</li> <li>• Vegetation type and condition mapping at 1:10,000 scale</li> </ul>	September 2022 (Primary South-West Interzone)	No limitations identified	IBSA-2025-0492

## 2.6.1 Vegetation

### 2.6.1.1 *Vegetation Associations*

Broad scale vegetation mapping of WA conducted by J.S. Beard as vegetation associations, of which three are located within the Clearing Footprint:

- Association 20 - Low woodland, open low woodland or sparse woodland. *Mulga Acacia aneura* and associated species.
- Association 468 - Woodland other. Gimlet, redwood etc. *E. salubris*, *E. oleosa*
- Association 1294 - Low Woodland; Mulga mixed with *Allocasuarina cristata* & *Eucalyptus sp.*

Areas retaining less than 30% of their pre-European vegetation extent show accelerated species loss, whilst areas with less than 10% are considered “endangered” (EPA, 2000). Clearing which would put the threat level into the 30% “threshold level” should be avoided (EPA 2000). All mapped associations are largely intact with over 96% of pre-European vegetation remaining according to the 2018 Statewide Vegetation Statistics (DBCA 2019), and accordingly clearing is not inconsistent with the EPA position statement.

Pre-European vegetation associations within the Clearing Footprint are summarised in Table 2-3. Representation of these vegetation associations is summarised in Table 2-4.

**Table 2-3: Pre-European Vegetation Associations**

Vegetation Association	Extent Remaining	DBCA Managed	Extent within Clearing Footprint
20 - Low woodland; mulga mixed with <i>Allocasuarina cristata</i> & <i>Eucalyptus sp.</i>	1,292,474 ha (99.8%)	250,985 ha (19.4%)	1,219.49 ha (<0.1%)
468 - Medium woodland; salmon gum & goldfields blackbutt	583,902 ha (98.6%)	135,197 ha (23.1%)	1,042.46 ha (0.2%)
1294 - Low Woodland; Mulga mixed with <i>Allocasuarina cristata</i> & <i>Eucalyptus sp.</i>	6,047 ha (96.0%)	115 ha (1.9%)	1.59 ha (<0.1%)

**Table 2-4: Representation of pre-European Vegetation Associations (GoWA, 2019).**

Vegetation Association	Scale	Area	Pre-European Extent (ha)	Current Extent (ha)	% remaining	% remaining in DBCA reserves
20	Statewide WA		1,295,103	1,292,475	99.8	19.4
	IBRA Subregion	East Murchison	1,174,259	1,171,631	99.8	15.5
		Eastern Goldfields	11,862	11,862	100	8.9
	City of Kalgoorlie-Boulder		728,313	726,233	99.7	8.6
468 -	Statewide WA		592,022	583,903	98.6	23.2
	IBRA Subregion	East Murchison	8,632	8,510	98.6	52.6
		Eastern Goldfields	482,362	474,365	98.3	22.4
	City of Kalgoorlie-Boulder		303,530	296,699	97.8	4.7
1294	Statewide WA		6,296	6,047	96.0	1.90
	IBRA Subregion	Eastern Goldfields	6,296	6,047	96.0	1.90
		City of Kalgoorlie-Boulder		2,910	2,669	91.7

### 2.6.1.2 Vegetation Types














Across the three vegetation surveys conducted over the Study Area (13,193 ha), a total of 43 vegetation types were identified and mapped. Within the Clearing Footprint a total of nine broad vegetation communities were described. Table 2-5 provides a summary of vegetation types, consolidating descriptions across studies to enable comparison of similar vegetation communities as shown in Figure 2-2.

**Table 2-5: Vegetation Types**

Vegetation Communities	Vegetation Types / Codes			Study Area (ha)	Clearing Footprint (ha)
	Phoenix 2025a	Phoenix 2024a	Phoenix 2022		
Low <i>Casuarina</i> woodlands	CpSafMs, CpSsAe, CpAbEgPo	CEP	CDP, CEP	204.8	204.8
Low <i>Eucalyptus</i> woodlands	ErEpMt, EISsMt, EsaluTdAv, EsaluEiiMsMt, EspAbSafPo	EEA, EES	EES	1581.7	1,583.16
Mid <i>Eucalyptus</i> woodlands	EsalmAnsMt, EsalmMsMt, EivSc, EsaluAhPo	EA, EAE, EEE, EM	EA, EAE, EEE, EM, ET	336.0	336.0
Low <i>Melaleuca</i> woodland	MsMsEpa	-	-	18.3	18.3
<i>Eremophila</i> shrubland	EsAvSd	MS, EP	-	96.6	96.6
Tall <i>Acacia</i> shrubland	-	AE, AEP, AS	AEP	159.2	0.0
<i>Marieana</i> shrubland	-	Ma	MS	0.8	0.8
Low mixed woodland	-	ECAE		4.7	4.7
Mid <i>Eucalyptus</i> mallee	-	EmA, EmAE	EmA, EmAE	0	0
Cleared	Cleared	Disturbed	Disturbed	18.4	18.4
<b>Total</b>				<b>13,191</b>	<b>2,263.54</b>

# Vegetation Type

Figure 2-2

-  Clearing Footprint
-  Proposed Clearing
-  Combined Survey Area
-  Casuarina woodland
-  Eremophila shrubland
-  Low Eucalyptus woodland
-  Low mixed woodland
-  Marieana shrubland
-  Melaleuca woodland
-  Mid Eucalyptus mallee
-  Mid Eucalyptus woodland
-  Tall Acacia shrubland
-  Cleared



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RESOURCES LIMITED

Scale: 1:15000  
Date: 5/12/2025  
Author: McDonald, Lochlan R.

Coordinate System:  
GDA2020 / MGA zone 51



*2.6.1.3 Vegetation Condition*











Vegetation condition within the Clearing Footprint has been assessed in accordance with EPA Guidance (EPA 2016) including a rating from excellent to completely degraded. The majority of vegetation within the Study Area ranges between good to excellent condition (90.7%) with the Clearing Footprint having similar condition. The proposed clearing would result in a minor decrease to vegetation of good or higher condition in the Study Area (decrease of 0.4%). Vegetation condition is summarised in Table 2-6 and presented in Figure 2-3.

**Table 2-6: Vegetation Condition**

<b>Condition Rating</b>	<b>Study Area</b>	<b>Clearing Footprint</b>
Excellent	2,359 ha (17.9%)	850.75 ha (37.58%)
Very Good	6,573 ha (49.8%)	1252.52 ha (55.33%)
Good	3,032 ha (23.0%)	122.84 ha (5.43%)
Poor	349 ha (2.6%)	3.68 ha (0.16%)
Degraded	350 ha (2.7%)	11.99 ha (0.53%)
Completely Degraded	527 ha (4.0%)	21.76ha (0.96%)
<b>Total</b>	<b>13,191 ha</b>	<b>2,263.54 ha</b>

# Vegetation Condition

Figure 2-3

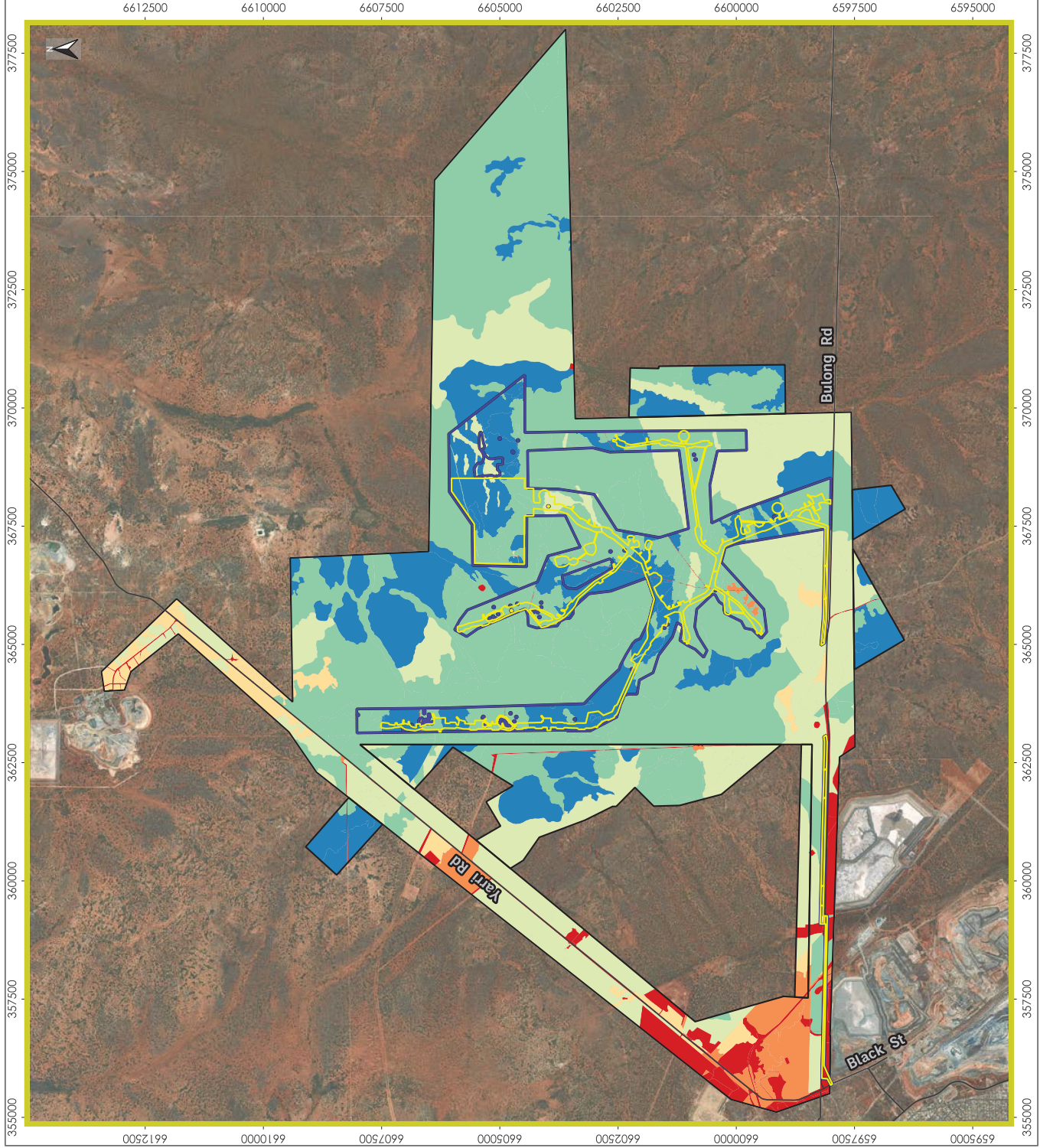
-  Clearing Footprint
  -  Proposed Clearing
  -  Roads
  -  Combined Survey Area
- Vegetation Condition**
-  Excellent
  -  Very Good
  -  Good
  -  Poor
  -  Degraded
  -  Completely Degraded



NORTHERN STAR  
RESOURCES LIMITED

Scale: 1:15000  
Date: 4/12/2025  
Author: McDonald, Lochlan R.

Coordinate System:  
GDA2020 / MGA zone 51



#### 2.6.1.4 Significant Vegetation

Desktop searches of Threatened Ecological Communities (TEC) and Priority Ecological Communities (PEC) identified no TECs and one PEC within the desktop search area. This was the Emu Land System (P3) and is located 16.5 km outside the Study Area. None of the vegetation types mapped across surveys are analogous to TECs or PECs (Phoenix 2025a), and consequently there is very low risk of any being present within the Clearing Footprint.

Within the Clearing Footprint, five vegetation types are considered to potentially have some local significance, based on their restricted extent or potential suitable habitat for Priority flora species. These vegetation types are not formally listed under State or Commonwealth legislation but may be considered significant in the context of the local landscape (Phoenix 2025a):

- MsMsEpa (18.33 ha): spatially restricted within the Clearing Footprint representing less than 1%.
- CpSafMs (21.13 ha), CpSsAe (105.85 ha), ElSsMt (424.63 ha), ErEpMt (484.62 ha): Potential suitable habitat for Priority flora.

There were no groundwater dependent ecosystems identified during the field survey (Phoenix 2025a). Based upon the depth to groundwater, hypersaline nature of groundwater, and lack of identified vegetation associations, it can be concluded that no groundwater dependent ecosystems are located within the Clearing Footprint.

#### 2.6.2 Flora

A total of 131 flora taxa across 27 families and 62 genera were recorded including 124 native species, six introduced species and one unidentified species (Phoenix 2025b). The most prominent families recorded were *Chenopodiaceae* (24 spp.), *Scrophulariaceae* (18 spp.), *Poaceae* (15 spp.), *Fabaceae* (13 spp.), *Asteraceae* (11 spp.) and *Myrtaceae* (10 spp.).

##### 2.6.2.1 Significant Flora

No Threatened flora were recorded within the Study Area or Clearing Footprint. Three Priority flora were identified in the Study Area including *Eremophila praecox* (Priority 2), *Allocasurina eriochlamys* subsp. *grossa* (Priority 3), *Notisia intonsa* (Priority 3). Two records of *Streptoglossa cylindriceps* (non-listed) were also identified within the Clearing Footprint which represents a range extension of 80 km and are potentially locally significant, despite the species having an expansive range across Australia. The Clearing Footprint has been designed to excise Priority flora and protect these plants within exclusion zones with protective buffers.

The only Priority flora species within 500 m of the Clearing Footprint is *Eremophila praecox* (P2). *E. praecox* is a small, broom-like shrub growing 1.5 – 3 m tall with purple flowers typically in October or December. *E. praecox* is distributed over an area of approximately 140 km north-south by 110 km east-west around Kalgoorlie. Suitable habitat is also likely to occur outside its currently known range (Phoenix, 2020). Targeted surveys undertaken across multiple years have confirmed that *E. praecox* is more widely distributed, more abundant, and occupies a greater variety of habitats than previously recorded in databases such as FloraBase or NatureMap.

This species typically occurs at low densities in Eucalyptus and / or Casuarina woodlands with an understorey of Acacia, Eremophila, Senna, and Maireana species. Soils are generally red clay loam on flat to gently undulating plains (Phoenix 2024b). These habitat types are common both within the Clearing Footprint and the surrounding Study Area and broader landscape.

A targeted regional survey (Phoenix 2025c) recorded 93 plants across eight different land systems (BB5, Campsite, Doney, Gumland, Kanowna, Moriarty, Mx43, Yilgangi) (Phoenix 2025c). Some of these land systems are present within or near the current Clearing Footprint. In addition, *E. praecox* has also been recorded in disturbed areas and rehabilitated sites, suggesting a broader ecological tolerance than many conservation-listed flora.

Additional populations of *E. praecox* were recorded by Phoenix during 2023 and 2024 surveys, adding a further 30 individuals, primarily in Eucalyptus and Casuarina woodlands. The current total number of known records for this species is 785 individuals across the Goldfields region (Phoenix 2025c) as shown in Figure 2-4.

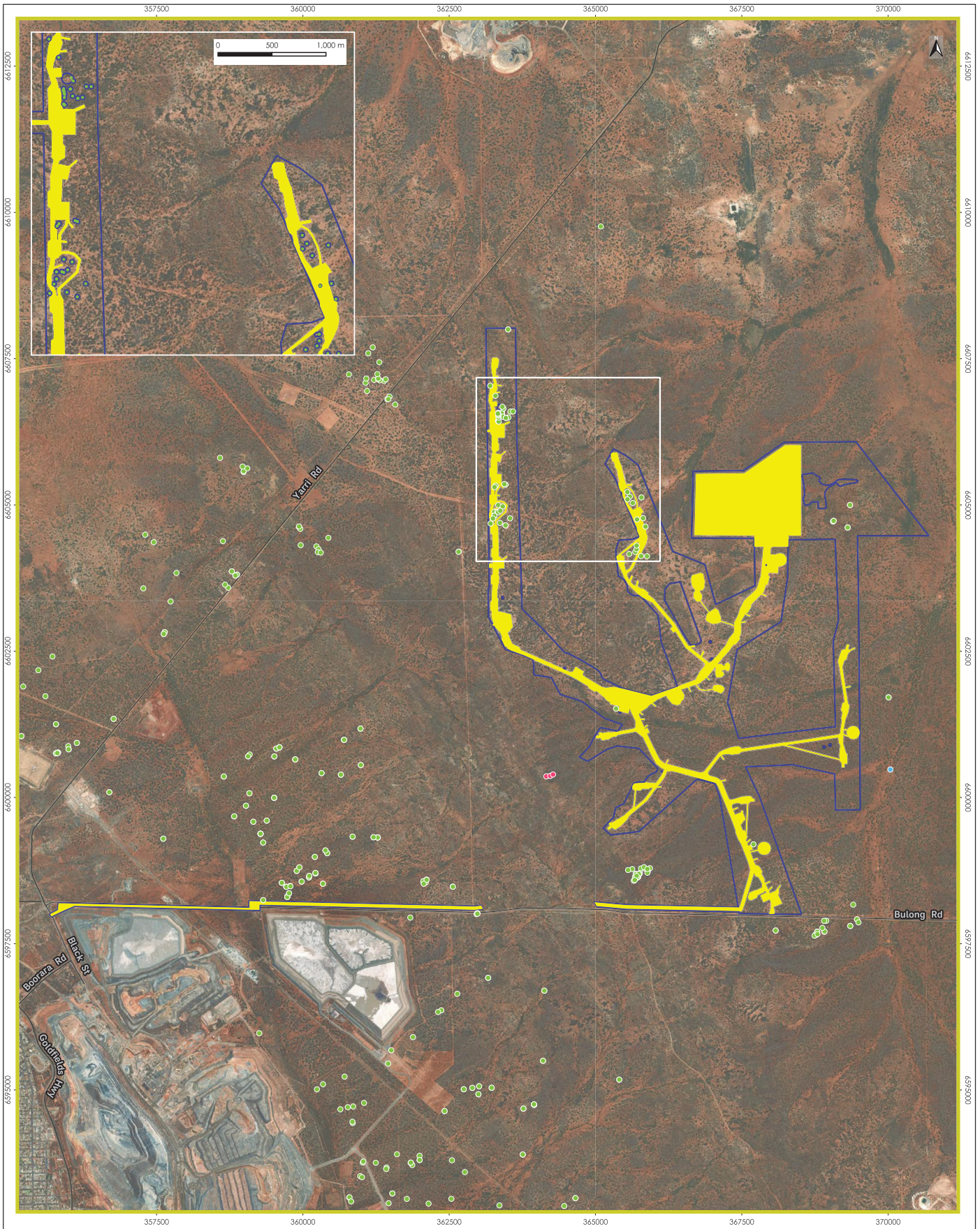
Of these, over 28% occur within conservation reserves, including Karrawang Nature Reserve and Bullock Holes Timber Reserve (Phoenix 2025c; WA Herbarium, 1998).

#### 2.6.2.2 *Introduced Flora*

Six introduced flora species were recorded in the Clearing Footprint by Phoenix (2025c):

- *Mesembryanthemum nodiflorum* (Slender Iceplant)
- *Centaurea melitensis* (Maltese Star-thistle)
- *Carrichtera annua* (Ward's Weed)
- *Salvia verbenaca* (Wild Clary)
- *Pentameris airoides* subsp. *airoides* (False Hairgrass)
- *Lysimachia arvensis* (Scarlet Pimpernel)

None of these introduced flora species are classified as Declared Pests or Weeds of National Significance (WoNS). The nearest known WoNS is African Boxthorn (*Lycium ferocissimum*), which has been recorded in two locations, 343 m and 114 m north of the Clearing Footprint.



# Conservation Significant Flora

Figure 2-4

- Clearing Footprint
- Proposed Clearing
- Roads
- *Allocasuarina eriochlamys* subsp. *grossa* (P3)
- *Eremophila praecox* (P2)
- *Notisia intonsa* (P3)



## 2.7 Terrestrial Fauna

Several surveys were conducted specifically for this Proposal that identified and described fauna and habitat within a 13,194 ha Study Area that encompasses the Clearing Footprint. These studies included a review of previous surveys and studies to gain a comprehensive understanding of terrestrial fauna values within the Clearing Footprint and immediate surrounds.

All other fauna surveys were conducted in accordance with EPA guidelines, including desktop assessments considering potential species recorded within 40 km of the Proposal and field surveys conducted in multiple seasons between 2022 and 2024. Terrestrial Fauna studies are attached as appendices have been submitted to the IBSA where appropriate, and are summarised in Table 2-7.

There are no guidelines for surveying for the Inland Hairstreak Butterfly (IHB) (*Jalmenus aridus*) (Priority 1) given it is difficult to predict when and where they might emerge. Most observations have been recorded in October to November and, as such, this is considered the best time to conduct field survey for adults (Phoenix 2025d). The surveys for IHB were undertaken in a similar method as outline in the DBCA guidelines for sampling the Arid Bronze Azure Butterfly (DBCA 2020).

**Table 2-7: Terrestrial Fauna Studies**

Study	Survey Area	Study Type	Fieldwork Season	Limitations	IBSA Number
Phoenix 2025e <b>Appendix F</b>	Study Area including Clearing Footprint (15,022 ha effort across 13,185 total ha due to 1,837 overlap)	Basic and targeted terrestrial fauna survey.	September 2022 (11,413 ha) November 2023 (2,795 ha) June 2024 (814 ha)	No limitations identified.	IBSA-2025-0516
Phoenix 2025d <b>Appendix G</b>	Study Area including Clearing Footprint (8,248 ha effort)	Targeted survey for <i>Camponotus sp. nr. terebrans</i> and <i>Jalmenus aridus</i> .	August 2022 November 2023 June 2024 October - November 2024 April 2025 October 2025	Availability of contextual information at a regional and local scale.	IBSA-2025-0474
Phoenix 2025g <b>Appendix H</b>	Study Area including preliminary Clearing Footprint	Targeted Malleefowl survey	September 2022 November 2023 June 2024 February 2025	No limitations identified.	IBSA-2025-0517
Anditi 2025a <b>Appendix I</b>	Regional area encompassing Clearing Footprint (32 km <sup>2</sup> )	Malleefowl mound analysis from LiDAR	February 2025 (LiDAR flyover)	Can identify false positive where features mimic the shape and size of mounds.	N/A
Anditi 2025b <b>Appendix J</b>	Regional area encompassing Clearing Footprint (160 km <sup>2</sup> )	Malleefowl mound analysis from LiDAR	December 2024 (LiDAR flyover)	Can identify false positive where features mimic the shape and size of mounds.	N/A
Donato Environmental Services (DES) 2025 <b>Appendix K</b>	Study Area and Kalgoorlie Water Treatment Plant	Bird and bat risk assessment including bird and bat baseline surveys. Report includes first 7 months of 24-month monitoring program	October 2024 - ongoing	Lack of winter survey season and multiple years to adjust for annual variability.	N/A

2.7.1 Fauna Habitat













Eight broad habitat types have been mapped across the Study Area, with all habitat types regionally widespread and contiguous across the Eastern Goldfields region (Phoenix 2025e). Fauna habitats within the Clearing Footprint are primarily open woodland, shrubland and groved woodland, representing over 90% of both extents. These are the most well represented fauna habitats within the broader Study Area (86.5%), with rarer habitat types including minor breakaway and farm dam not included in the Clearing Footprint. Fauna habitat is summarised in Table 2-8 and shown in Figure 2-5.

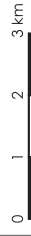
**Table 2-8: Fauna Habitat**

Habitat Type	Description	Study Area	Clearing Footprint
Open woodland	Open woodland over low mixed shrubs on clay loam plain. High abundance of large fallen logs, large trees with hollows and leaf litter.	5,336 ha (40.5%)	1,012.01 ha (44.7%)
Shrubland	Shrubland with scattered mallee, Eucalyptus and Allocasuarina on clay loam with gravel or sparse sand. Dense shrubby understory provides cover from predators. High abundance of flowering/seeding shrubs.	4,021 ha (30.5%)	274.90 ha (12.2%)
Groved woodland	Groved Eucalyptus woodland over mixed shrubs on plains and low hills. Areas of dense vegetation interspersed with open patches.	2,051 ha (15.6%)	804 ha (35.5%)
Floodplain	Floodplain with scattered trees, shrubs and grasses on clay loam. Likely to be seasonally inundated.	387 ha (2.6%)	5.85 ha (0.3%)
Drainage line	Drainage line with Eucalyptus over mixed shrubs on clay loam soils. Thick patches of leaf litter.	621 ha (4.7%)	148.37 ha (6.6%)
Minor breakaway	Open Eucalyptus woodland over scattered shrubs on stony hill slopes with minor breakaway.	8 ha (0.06%)	0 ha (0%)
Grassland	Grassland cleared of nearly all upper story vegetation. Sparse Eucalyptus and mulga shrubs.	516 ha (3.8%)	5.95 ha (0.3%)
Farm Dam	Farm dams (pastoral dam) with permanent pools with scattered low-mid shrubs and grasses on dam walls.	2 ha (0.01%)	0 ha (0%)
Cleared	Cleared, infrastructure areas.	251 ha (1.9%)	12.44 ha (0.5%)
<b>All fauna habitats</b>		<b>13,191 ha</b>	<b>2,263.54 ha</b>

# Vertebrate Fauna Habitat

Figure 2-5

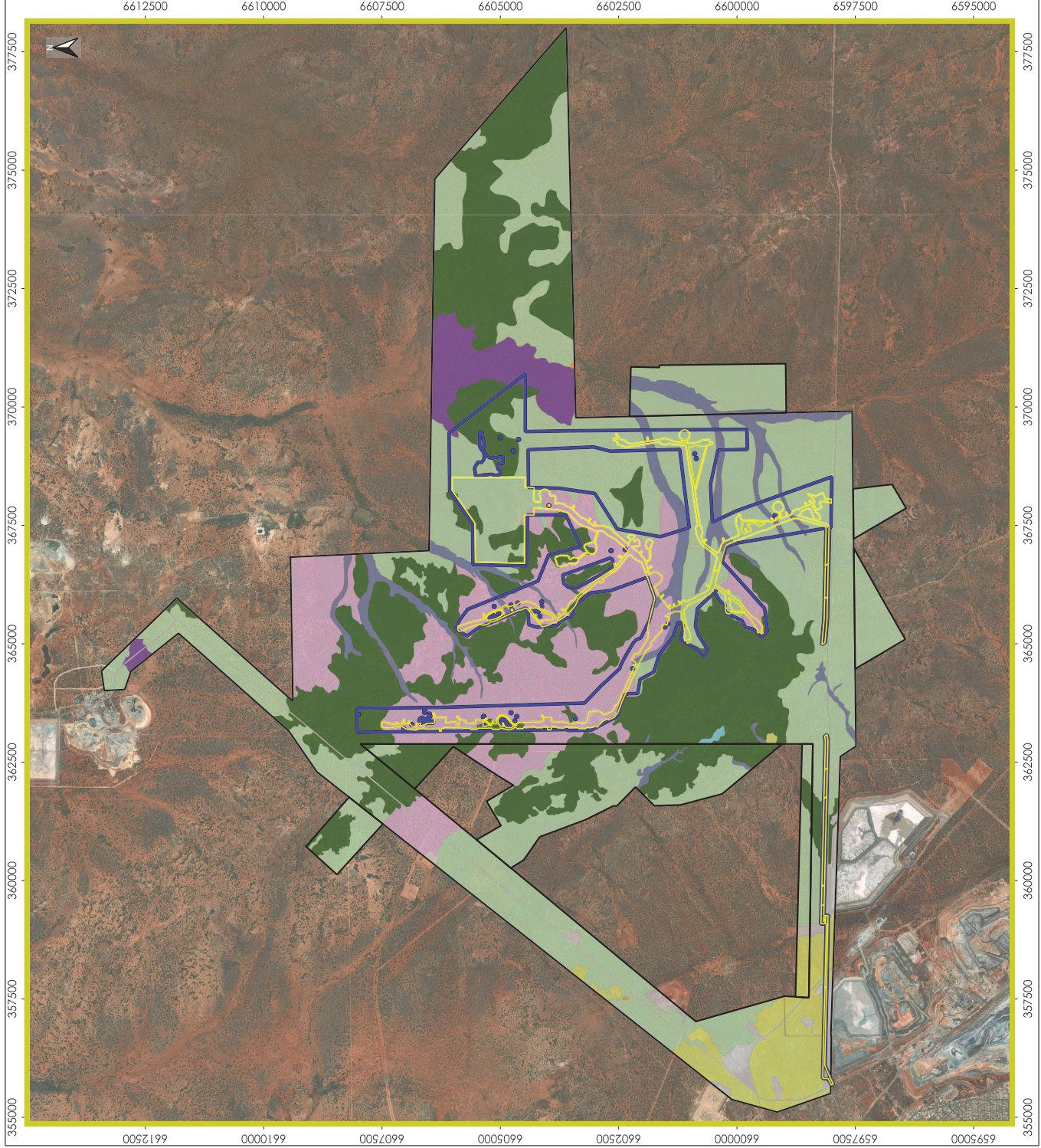
-  Clearing Footprint
  -  Proposed Clearing
  -  Combined Survey Area
- Vertebrate Fauna Habitat Type**
-  Drainage line
  -  Farm dam with permanent pools
  -  Floodplain
  -  Grassland
  -  Groved woodland
  -  Minor breakaway supporting open woodland
  -  Open woodland
  -  Shrubland
  -  Cleared



Scale: 1:15000  
 Date: 5/12/2025  
 Author: McDonald, Lochlan R.  
 Coordinate System:  
 GDA2020 / MGA zone 51



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## 2.7.2 Fauna

A desktop review identified records of 318 vertebrate fauna taxa within the 40 km search extent, of which 77 taxa were identified during field surveys representing 24% of species identified in the desktop review (Phoenix 2025e). All species identified in the field assessment were identified in the desktop review. Secondary evidence of introduced species (all mammals) were recorded scattered throughout the survey area as expected given the proximity to Kalgoorlie-Boulder (Phoenix 2025e). Species identified by grouping across both desktop and field assessments are summarised in Table 2-9.

**Table 2-9: Fauna Species Summary (Phoenix 2025)**

Fauna Group	Desktop	Field	Recorded %
Amphibians	6	0	0
Birds	187 (three introduced)	53	28
Mammals	40 (six introduced)	18 (four introduced)	45
Reptiles	85 (one introduced)	6	7
<b>Total</b>	<b>318</b>	<b>77</b>	<b>24</b>

### 2.7.2.1 *Significant Vertebrate Fauna*

Based on the desktop review, Phoenix (2025e) identified 30 conservation significant fauna as possibly occurring within the search extent, including 25 birds, four mammals and one reptile. Of these 30 species only one vertebrate species (Malleefowl, *Leipoa ocellata*) was recorded during the field survey. Following the field survey and habitat assessment Phoenix (2025f) undertook a likelihood assessment based upon presence within the Study Area based upon the following ratings:

- Recorded - species recorded within study area during survey.
- Likely - study area within current known range of species and suitable habitat present, recordings within study area.
- Possible - study area within current known range of species and suitable habitat present, no recordings within study area.
- Unlikely - study area outside current known range of species and no suitable habitat present.

Five significant fauna were determined to be likely, 14 were possible, and the remaining 10 were unlikely to occur within the Study Area (Phoenix 2025e).

DES (2025) also undertook a desktop review based on a slightly broader 50 km range from the Proposal Clearing Footprint and only on birds and bats which identified some additional species to Phoenix (2025e). DES (2025) is also undertaking a 24-month bird and bat monitoring program to determine bird and bat utilisation within the Study Area. The baseline monitoring program commenced in October 2024 and has a nominal completion date of October 2026.

Table 2-10 presents an amalgamated assessment of likelihood of significant fauna within the Clearing Footprint.

**Table 2-10: Significant Fauna Likelihood and WTG Risk Assessment**

CR = Critically Endangered, EN = Endangered, VU = Vulnerable, MI = Migratory, MA = Marine, P = Priority

Species Name	Conservation Status		Habitat		Likelihood of Occurrence (Phoenix 2025b & DES 2025)
	AUS	WA	Preference	Presence in Clearing Footprint	
<b>Birds</b>					
Southern Whiteface ( <i>Aphelocephala leucopsis</i> )	VU	VU	Woodland Shrublands	Yes	<b>Likely</b> Suitable habitats within Study Area and desktop records within Study Area. Widespread across Australia, especially in arid and semi-arid areas.
Fork-tailed Swift ( <i>Apus pacificus</i> )	MI	MI	Aerial (does not land in Australia)	N/A	<b>Recorded</b> Recorded by DES (2025).
Fan-tailed Cuckoo ( <i>Cacomantis flabelliformis</i> )	MA	-	Woodlands	Yes	<b>Recorded</b> Suitable habitats present within the study area. Recorded by DES (2025).
Pallid Cuckoo ( <i>Cacomantis pallidus</i> )	MA	-	Woodlands	Yes	<b>Recorded</b> Suitable habitats present within the study area. Recorded by DES (2025).
Whiskered Tern ( <i>Chlidonias hybrida</i> )	MI	MI	Wetlands, salt lakes	No	<b>Possible</b> Usually absent during dry conditions, sometimes for years. Rarely present on mine infrastructure water sources. Present at times at the KWTP, during favourable conditions.
Rainbow bee-eater ( <i>Merops ornatus</i> )	MI	-	Woodlands	Yes	<b>Recorded</b> Suitable habitats present within Study Area. Recorded by DES (2025).
Hooded Plover ( <i>Thinornis cucullatus</i> )	EN	P4	Wetlands, salt lakes	No	<b>Unlikely</b> Suitable habitat absent. Possible visitor to salt lakes 6 - 20 km from study area.
Grey Falcon ( <i>Falco hypoleucos</i> )	-	VU	Open grasslands	Yes	<b>Unlikely</b> Rarely recorded in southern WA, may be a rare visitor. Suitable woodland, grassland and shrubland habitat present within the study area.
Peregrine Falcon ( <i>Falco peregrinus</i> )	-	OS	Shrublands Woodlands	Yes	<b>Likely</b> Previously recorded nearby at Kanowna Belle mine, suitable habitat in study area.
Western Grasswren ( <i>Amytornis textilis</i> subsp. <i>textilis</i> )		P4	-	-	<b>Unlikely</b> Not identified by Phoenix 2025b in the assessment.
Malleefowl ( <i>Leipoa ocellata</i> )	VU	VU	Shrublands Woodlands	Yes	<b>Recorded</b> Suitable nesting and foraging habitat in open woodland, woodland and shrubland habitat.
Grey Wagtail ( <i>Motacilla cinerea</i> )	MI	MI	Coastal areas	No	<b>Unlikely</b> Suitable stream and river habitat absent.
Blue-billed Duck ( <i>Oxyura australis</i> )		P4	Wetlands, salt lakes	No	<b>Possible</b> Possible rare visitor to permanent water features within the Study Area. Additionally, may traverse Study Area to salt lakes 7-20 km outside study area.
Western Rosella (inland ssp.) ( <i>Platycercus icterotis</i> subsp. <i>xanthogenys</i> )		P4	Woodlands	Yes	<b>Likely</b> Suitable woodland habitat present. Recorded by Phoenix twice, both records within 2.3 km of the study area (Phoenix 2013, 2014a).

Species Name	Conservation Status		Habitat		Likelihood of Occurrence (Phoenix 2025b & DES 2025)
	AUS	WA	Preference	Presence in Clearing Footprint	
Carnaby's Black Cockatoo ( <i>Zanda latirostris</i> )	EN	EN	Forests Woodlands (Bankisa) Shrublands	No	<b>Unlikely</b> Study area outside of current known range of species.
<i>Pezoporus occidentalis</i> Night Parrot	CR	CR	Spinifex grassland	No	<b>Unlikely</b> Suitable spinifex habitat absent.
Princess Parrot ( <i>Polytelis alexandrae</i> )		P4	Woodland	Yes	<b>Unlikely</b> Study area outside of core range. Possibly a very rare visitor following periods of high rainfall
Common Sandpiper ( <i>Actitis hypoleucos</i> )	MI	MI	Wetlands, salt lakes	No	<b>Possible</b> Possible rare visitor to permanent water features within the Study Area. Additionally, may traverse Study Area to salt lakes 7-20 km away.
Sharp-tailed Sandpiper ( <i>Calidris acuminata</i> )	MI	MI	Wetlands, salt lakes	No	<b>Possible</b> Possible rare visitor to permanent water features within the Study Area. Additionally, may traverse Study Area to salt lakes 7-20 km away.
Sanderling ( <i>Calidris alba</i> )	MI	MI	Wetlands, salt lakes	No	<b>Possible</b> Possible rare visitor to permanent water features within the Study Area. Additionally, may traverse Study Area to salt lakes 7-20 km away.
Curlew Sandpiper ( <i>Calidris ferruginea</i> )	CR & MI	CR	Wetlands, salt lakes	No	<b>Possible</b> Possible rare visitor to permanent water features within the Study Area. Additionally, may traverse Study Area to salt lakes 7-20 km away.
Pectoral Sandpiper ( <i>Calidris melanotos</i> )	MI	MI	Wetlands, salt lakes	No	<b>Possible</b> Possible rare visitor to permanent water features within the Study Area. Additionally, may traverse Study Area to salt lakes 7-20 km away.
Red-necked Stint ( <i>Calidris ruficollis</i> )	MI	MI	Wetlands, salt lakes	No	<b>Possible</b> Possible rare visitor to permanent water features within the Study Area. Additionally, may traverse Study Area to salt lakes 7-20 km away.
Black-tailed Godwit ( <i>Limosa limosa</i> )	EN & MI	MI	Coastal	No	<b>Possible</b> Possible rare visitor to permanent water features within the Study Area. Additionally, may traverse Study Area to salt lakes 7-20 km away.
Grey-tailed Tattler ( <i>Tringa brevipes</i> )	MI	MI & P4	Coastal	No	<b>Possible</b> Possible rare visitor to permanent water features within the Study Area. Additionally, may traverse Study Area to salt lakes 7-20 km away.
Wood Sandpiper ( <i>Tringa glareola</i> )	MI	MI	Wetlands, salt lakes	No	<b>Possible</b> Possible rare visitor to permanent water features within the Study Area. Additionally, may traverse Study Area to salt lakes 7-20 km away.

Species Name	Conservation Status		Habitat		Likelihood of Occurrence (Phoenix 2025b & DES 2025)
	AUS	WA	Preference	Presence in Clearing Footprint	
Common Greenshank ( <i>Tringa nebularia</i> )	MI	MI	Wetlands, salt lakes	No	<b>Possible</b> Possible rare visitor to permanent water features within the Study Area. Additionally, may traverse Study Area to salt lakes 7-20 km away.
Marsh Sandpiper ( <i>Tringa stagnatilis</i> )	MI	MI	Wetlands, salt lakes	No	<b>Possible</b> Possible rare visitor to permanent water features within the Study Area. Additionally, may traverse Study Area to salt lakes 7-20 km away.
Glossy Ibis ( <i>Plegadis falcinellus</i> )	MI	MI	Wetlands, salt lakes	No	<b>Possible</b> Possible rare visitor to permanent water features within the Study Area. Additionally, may traverse Study Area to salt lakes 7-20 km away.
<b>Mammals</b>					
Chuditch ( <i>Dasyurus geoffroii</i> )	VU	VU	Woodlands, Mallee, Heath	Yes	<b>Unlikely*</b> Unconfirmed scat recorded within the study area - not definitive without genetic testing. Whilst previously widely distributed, there are no recent records of Chuditch east of the Boorabbin sandplain (over 100 km away).
Numbat ( <i>Myrmecobius fasciatus</i> )	EN	EN	Woodlands	Yes	<b>Unlikely</b> Study area outside of current known range which is restricted to isolated populations in southwest WA.
Bilby ( <i>Macrotis lagotis</i> )	VU	VU	Spinifex grasslands	No	<b>Unlikely</b> Study area outside of current known range and preferred habitat absent.
Central Long-eared Bat ( <i>Nyctophilus major subsp. tor</i> )	-	P3	Woodlands	Yes	<b>Likely</b> Previously observed in 2011 during bat survey at Kanowna Belle mine site (17 km north). Recorded across Goldfields region.
<b>Reptiles</b>					
Western Spiny-tailed Skink ( <i>Egernia stokesii subsp. badia</i> )	EN	VU	Woodlands	Yes	<b>Unlikely</b> Study area outside of current known range, which is limited to semi-arid areas of southwest WA.
<b>Invertebrates</b>					
Arid Bronze Azure Butterfly ( <i>Ogyris subterrestris petrina</i> )	CR	CR	Woodlands (specifically smooth barked <i>Eucalytus</i> sp.)	Yes	<b>Unlikely</b> No host ant species identified within the SA, habitat does not contain all required features for species.
Inland Hairstreak Butterfly ( <i>Jalmenus aridus</i> )	-	P2	Woodlands (specifically <i>Senna artemisioides ssp. Filifolia</i> )	Yes	<b>Recorded</b> Recorded within the SA by Phoenix 2025c.

\*Assessed as Possible by Phoenix 2025 - based upon balance of probabilities it is considered that one unidentified scat record is not sufficient evidence of occurrence given distance from current known range and absence of recent local records since 1974.

### 2.7.2.2 Malleefowl

Several targeted fauna surveys have been conducted for the Proposal, including targeted searches for Malleefowl. Extensive searches have been conducted throughout the Clearing Footprint and surrounds. During these searches, habitat values within the area have been identified, described and mapped, and any direct or indirect evidence of Malleefowl was recorded.

To assist with the identification of potential Malleefowl mounds, LiDAR analysis was conducted by Anditi (2025a; 2025b). These surveys acknowledge that there could be some false positives resulting from the remote sensing methodology employed. However, this information is valuable for informing a targeted approach of any additional surveys for in-field verification. There were nine very close matches and 29 similar matches to Malleefowl mounds with the combined 192 km<sup>2</sup> area surveyed by Anditi (2025a; 2025b).

A total of 77 survey sites were visited as part of the Malleefowl surveys. In the initial fauna survey (Phoenix 2025g), active searches were undertaken at 19 sites throughout the basic fauna survey areas for a total of 22 hours effort. An additional 58 sites were visited within the Clearing Footprint during a targeted Malleefowl survey conducted in February 2025.

Malleefowl habitat was assigned an overall habitat suitability score depending on the sum and combination of habitat attributes:

- **High** (score of 9 or more) is characterised by dense vegetation that provides screening and is defined as primary nesting, foraging, and dispersal habitat, that is regarded as habitat critical for the survival of the species
- **Moderate** (score of 4 to 8) can be split into two subcategories based on the habitat attributes:
  - **Moderate (i)** Suitable for foraging, dispersal, and may contain marginally suitable breeding habitat depending on the combination of the environmental variables
  - **Moderate (ii)** Suitable for foraging and dispersal (not suitable for breeding)
- **Low** (score of 3 or less) does not contain enough habitat features for it to be considered suitable for breeding, however it may still be used for dispersal and occasional foraging.

Malleefowl habitat within the Study Area is characterised by a mosaic of foraging and dispersal habitat interspersed with patches of breeding and marginal breeding habitat (Table 2-11) (Figure 2-6). Breeding habitat was generally identified in areas with higher elevation where soil conditions and vegetation structure are more favourable. Several Malleefowl mounds, both active and inactive, have been identified in these areas. Malleefowl in the Study Area and more broadly in the Goldfields occur as sparse populations.

**Table 2-11: Malleefowl Habitat Suitability**

Habitat Suitability	Survey Description	Extent within Study Area	Extent within Clearing Footprint
High	Breeding habitat	232 ha (1.8%)	0 (0%)
Moderate (i)	Marginal breeding habitat / foraging habitat	1,754 ha (13.3%)	0 (0%)
Moderate (ii)	Foraging and dispersal	5,541 ha (42.0%)	1,664.31 (73.53%)
Low	Marginal foraging and dispersal	5,417 ha (41.0%)	586.79 (25.92%)
None	Cleared area	251 ha (1.9%)	10.15 (0.87%)
<b>Total</b>		<b>13,194</b>	<b>2,263.54</b>

# Malleefowl Mound Locations






Figure 2-6

-  Indicative Footprint
-  Proposed Clearing
-  Combined Survey Area
-  Roads

## Malleefowl Mound Locations

-  Active
-  Inactive
-  Long Unused

## Malleefowl Habitat Suitability

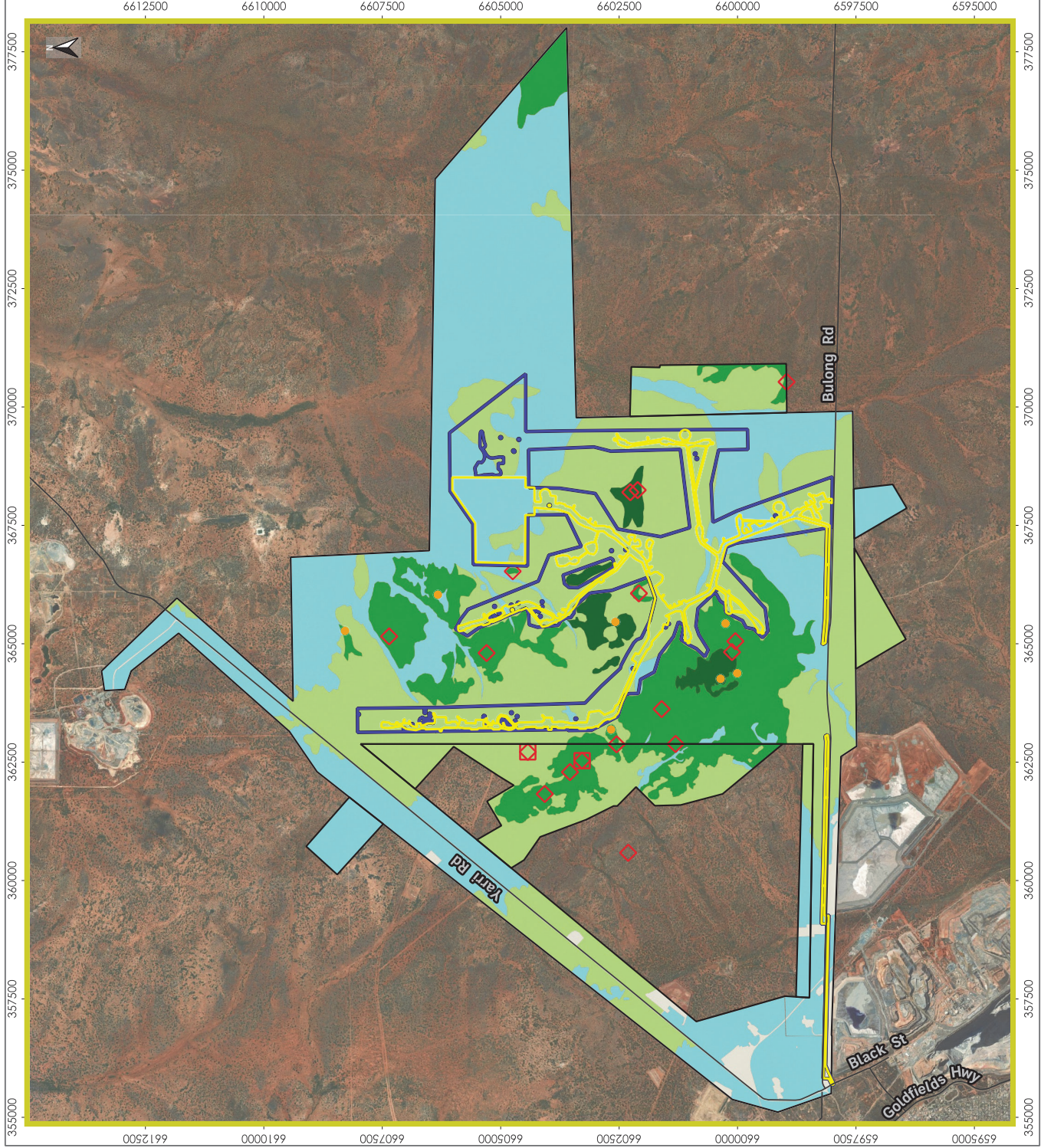
-  High - Critical / breeding
-  Moderate (i) - Marginal breeding / foraging
-  Moderate (ii) - Foraging and dispersal
-  Low - Marginal foraging and dispersal
-  None - cleared



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Scale: 1:15000  
Date: 2/2/2026  
Author: McDonaid, Lochlan R.

Coordinate System:  
GDA2020 / MGA zone 51



In November 2025 Malleefowl nesting mounds within the Study Area were visited by Northern Star and the National Malleefowl Recovery Group as part of the Malleefowl monitoring program for the Proposal. Prior to this monitoring event, baseline surveys had identified five active nesting mounds in the Study Area, with the nearest nesting mound approximately 600 m from the Clearing Footprint. In November 2025 two more nesting mounds were active. A total of seven active nesting mounds were recorded in the Study area. The remaining 17 mounds were inactive or long unused. The nearest active mound was approximately 200 m from the Clearing Footprint. Evidence of predation was also recorded during the monitoring event, with a carcass and feathers recorded in the vicinity of an active nesting mound about 200 m from the Clearing Footprint. Further details of the Malleefowl monitoring program for the Proposal is provided in the attached EMP (Appendix L).

Phoenix (2024) mapped potential Malleefowl habitat within 40 km of the Proposal (Table 2-12). Habitat was mapped more coarsely, based on publicly available data. Habitat types mapped included:

- **Suitable** - shrublands and low woodlands not dissected by drainage and with adequate tree / shrub cover to provide leaf litter, thermal shelter and visual screening from predators; presumed to represent foraging and potential nesting habitat for Malleefowl.
- **Suitable (mosaic)** - areas of suitable shrubland / woodland habitat interspersed with scattered areas of clearing (e.g. drill pads and tracks), naturally open patches, and / or drainage lines.
- **Drainage** - drainage lines with distinct channels or relatively dense fringing vegetation, may be used by Malleefowl for foraging but unlikely to support nesting.
- **Open / drainage** - open areas dissected by drainage lines with or without dense vegetation; potential foraging and dispersal habitat, not considered suitable for breeding.
- **Open** - naturally bare or sparsely vegetated areas including lakes, salt lake playa, extensive rock outcrop, scars of recent or intense fires, and sparse shrubland dominated by chenopods or hummock grass; marginal habitat value, unsuitable for breeding.
- **Cleared** - areas cleared for roads (other than single-lane unsealed access tracks), mines, and associated infrastructure, water storage dams etc., some partially regenerating as very low or open shrubland; negligible habitat value for Malleefowl.

The Study Area lies within a landscape that supports extensive, regionally widespread Malleefowl habitat, with the majority remaining intact and connected. At a landscape scale Malleefowl habitat is characterised by a mosaic of suitable breeding habitat interspersed by foraging and dispersal habitat.

**Table 2-12: Regional Malleefowl Habitat**

Habitat Type	Regional Extent (ha)	Extent within Clearing Footprint (ha)
Suitable	19,105 (2.5%)	0.0 (0.0%)
Suitable (mosaic)	388,739 (50.8%)	2,142 (94.7%)
Open/drainage	131,267 (17.2%)	107 (4.7)
Drainage	8,669 (1.1%)	0.0 (0.0%)
Open	196,720 (25.7%)	0.2 (0.0%)
Cleared	20,494 (2.7%)	13 (0.6%)
<b>Total</b>	<b>764,993</b>	<b>2,262</b>

### 2.7.2.3 Marine and Migratory Species

Migratory bird species have been recorded within the Study Area or have potential to visit the Clearing Footprint. Several of these species are known to use woodland and shrubland habitats like those in the Clearing Footprint for foraging and / or breeding; others prefer wetland habitats or areas that have permanent water present.

Migratory species are normally only in the Study Area during sporadic or seasonal migration periods or visit the area occasionally as vagrant visitors. Given similar habitats are common and widespread in the region, these species are unlikely to be restricted to or reliant on habitat within the Study Area. These species are generally resilient and adaptable to seasonal changes, reducing the likelihood of significant impact from habitat disturbance.

#### 2.7.2.4 Significant Invertebrate Fauna

Four surveys were conducted for listed butterflies: Arid Bronze Azure Butterfly (ABAB) (Critically Endangered - EPBC Act and BC Act) and Inland Hairstreak Butterfly (IHB) (Priority 1 - DBCA) led by Dr Rod Eastwood, a research associate at the WA Museum. Based upon combined survey effort 8,248 ha the surveys included sampling host ant species of ABAB (*C. sp. nr. terebrans*) at a total of 1,494 smooth barked *Eucalyptus* sp. trees and sampling host ant species of IHB (*Froggattella kirbii*) at *Senna artemisioides filifolia* and *Acacia tetragonophylla*.

Whilst much of the Study Area contains smooth barked *Eucalyptus* sp. trees, habitat only had a fraction of the requisite features for *C. sp. nr. terebrans* and none were detected (Phoenix 2025d). Consequently, it is considered that ABAB does not occur within the Study Area or Clearing Footprint.

A total of 5,025 ha of the Study Area represents suitable habitat for IHB based upon presence of *Senna artemisioides filifolia* and *Acacia tetragonophylla*, with host ant *Froggattella kirbii* found throughout. In total 29 IHB were observed from five breeding sites in the north-western section of the Study Area. This species is known to occur from 28 subpopulations across an extent of over 15,000 km<sup>2</sup> as of October 2025. All IHB breeding sites have been avoided and occur outside the Clearing Footprint.

To protect these conservation significant species from poaching the survey report (Appendix G) and butterfly impact assessment (Appendix M) have been provided confidentially.

#### 2.7.2.5 Short Range Endemic Fauna

Short range endemic (SRE) habitat potential was assessed by Phoenix (2025d) using a rating scale:

- **High** - defined / known areas of habitat that contain elements that often give rise to specialisation or dependency in invertebrate fauna.
- **Low** - areas of largely in-tact native vegetation that occur broadly across the landscape, are less incised and typically link more restricted habitats.
- **None** - land that has been previously cleared for other uses that no longer contains native vegetation.

High SRE potential was assigned to drainage line and minor breakaway. Drainage line habitat was attributed high SRE habitat potential due to habitat complexity and availability of moisture (Phoenix 2025e). It is noted that drainage lines are ubiquitous throughout the broader landscape. The remaining 2,115.02 ha (or 93.44%) of the Clearing Footprint is classified as low or none SRE potential. Details of the extent and description of each SRE habitat is presented in Table 2-14 and shown in Figure 2-7.

**Table 2-13: Short Range Endemic Habitat Potential**

SRE Potential	Habitat Type	Study Area (ha)	Clearing Footprint
High	Drainage line*	621 (4.7%)	148.52 (6.56%)
	Minor breakaway	8 (0.1%)	0 (0%)
Low	Open woodland	12,314 (93.4%)	2,102.63 (92.89%)
	Shrubland		
	Closed / semi-closed woodland		
	Groved woodland		
	Floodplain		
	Grassland		
None	Cleared	251 (1.9%)	12.39 (0.55%)
	Farm dam		
<b>Total</b>		<b>13,191 ha</b>	<b>2,263.54 ha</b>

A total of 52 specimens from 22 possible SRE taxa were collected from within the SA, including seven trapdoor spiders, six isopods, six pseudoscorpions, two centipedes and one scorpion. Of these, five were found within the DE of which none were confirmed SRE, four were potential SRE, and one was not an SRE (Phoenix 2025e). The four potential SRE were all located within habitat types that are widespread and contiguous with the surrounding landscape and are unlikely to be restricted to the Study Area (Phoenix

2025e). This includes both habitat that was assessed as high (drainage line) and low (open woodland, shrubland) SRE suitability. Nevertheless, these four species were conservatively assessed as potential SRE due to taxonomic data deficiencies and are detailed in Table 8-9.

**Table 2-14: Potential SRE Species within DE**



Group	Taxa	Assessment	SRE Status
Trapdoor spider	Idiosoma 'MYG244'	Collected from 4 sites in drainage and shrubland within the Study Area. Also known from a site located approximately 1 km south-east of the Study Area. The habitats from which it has been recorded extend throughout the regional area.	Potential SRE due to data deficiency.
	Cethegus 'MYG050',	Previously recorded in the Study Area. 2.2% divergent from PES34650 and is therefore considered conspecific.	Not a SRE - widespread.
Pseudoscorpion	Beierolpium sp. indet 'Phoenix 0187'	Collected from 2 sites in drainage (within Clearing Footprint) and open woodland (outside Clearing Footprint) which extend into surrounding region. Given the widespread nature of the habitat, it is unlikely that this species is restricted to the Study Area.	Potential SRE owing to data deficiency.
	Chernetidae sp. indet	Collected from 1 site in open woodland which extend into surrounding region. Given the widespread nature of the habitat, it is unlikely that this species is restricted to the Study Area.	SRE status uncertain owing to taxonomic data deficiency.
	Chernetidae 'Phoenix0185	Collected from 4 sites distributed across the study area and all located in open woodland (3 within Clearing Footprint). Given the widespread nature of the habitat, it is unlikely that this species is restricted to the Study Area. Insufficient resolution in the phylogeny to place this taxon into a genus group.	Potential SRE owing to taxonomic data deficiency.

# SRE Habitat

Figure 2-7

-  Clearing Footprint
-  Proposed Clearing

## SRE Habitat (Phoenix, 2025)

-  High
-  Low

## Potential SRE Species

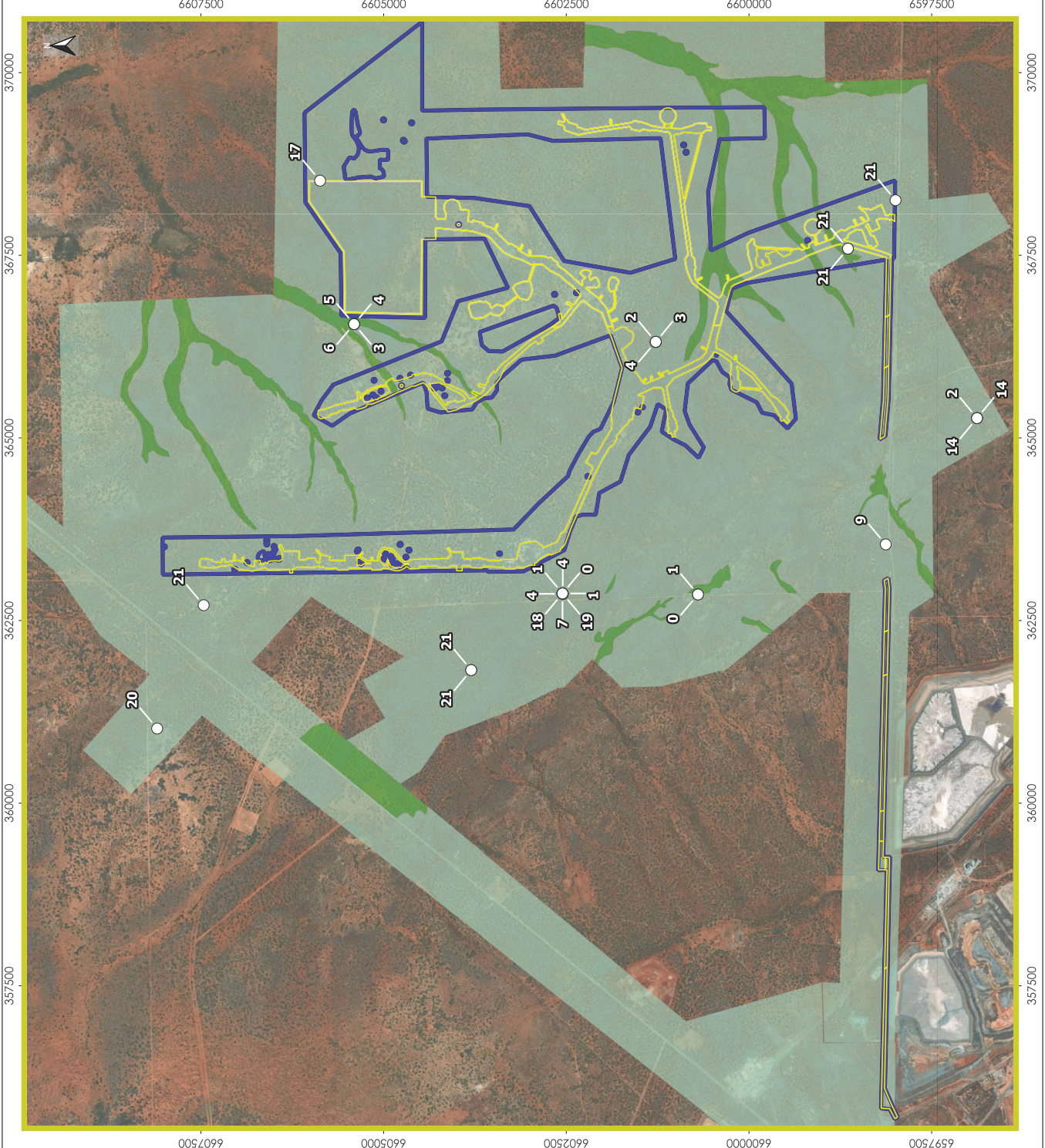
- 0. *Beierolpium sp. indet.* - Uncertain
- 1. *Philosciidae KWB* - Potential
- 2. *Beierolpium 'Phoenix0187'* - Potential
- 3. *Chernetidae sp. indet.* - Widespread
- 4. *Idiosoma 'MYG244'* - Potential
- 5. *Cryptops sp. indet.* - Potential/Uncertain
- 6. *Paraplatharthus KWB1* - Potential
- 7. *Buddleludia cf. frontosa* - Potential
- 9. *Gaius austini* - Widespread
- 14. *Synsphyronus sp. indet.* - Uncertain
- 17. *Cethagus 'MYG050'* - Widespread
- 18. *Buddleludia sp. indet.* - Potential/Uncertain
- 19. *Lychas 'splendens'* - Widespread
- 20. *Beierolpium 'Phoenix0186'* - Potential
- 21. *Chernetidae 'Phoenix0185'* - Potential



Scale: 75000  
 Date: 5/12/2025  
 Author: McDonaid, Lochlan R.  
 Coordinate System:  
 GDA2020 / MGA zone 51



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### 3 Clearing Assessment

#### 3.1 Principle (a)

##### **Native vegetation should not be cleared if it comprises a high level of biological diversity**

Biological diversity within the Clearing Footprint is typical of the eastern Goldfields, characterised by vegetation communities and fauna habitat types that are well represented both locally and regionally. No TECs or PECs occur in the Clearing Footprint. However, five vegetation types present may be locally significant based on their restricted extent or potential suitable habitat for Priority flora species. MsMsEpa is spatially restricted representing less than 1% of the Clearing Footprint. CpSafMs, CpSsAe, ElSsMt, ErEpMt have potential provide suitable habitat for Priority flora.

The Proposal will require clearing of up to 302.5 ha of vegetation types that may be locally significant:

- About 0.5 ha of the 18.3 ha of MsMsEpa within the Clearing Footprint will require clearing. This represents a 2.7% reduction in the patch of MsMsEpa within the Clearing Footprint. Given 97.3% of the patch of MsMsEpa will be retained, this impact is not significant.
- Up to 302 ha of vegetation that is potentially suitable habitat for *Eremophila praecox* (P2) will that require clearing. 4,093 ha (93%) of habitat suitable for *E. praecox* will be retained within the Study Area. While vegetation types CpSafMs, CpSsAe, ElSsMt and ErEpMt may provide suitable habitat for *E. praecox*, this species occurs in a variety of vegetation types and land units throughout the region and vegetation types within the Clearing Footprint are not critical for conservation of the species.

Three Priority flora were identified in the broader Study Area: including *Eremophila praecox* (Priority 2), *Allocasurina eriochlamys* subsp. *grossa* (Priority 3), *Notisia intonsa* (Priority 3). The only Priority flora species within 500 m of the Clearing Footprint is *Eremophila praecox* (P2). *E. praecox* is distributed over an area of approximately 140 km north-south by 110 km east-west around Kalgoorlie. Suitable habitat is also likely to occur outside its currently known range (Phoenix, 2020). Targeted surveys undertaken across multiple years have confirmed *E. praecox* is more widely distributed, more abundant, and occupies a greater variety of habitats than previously recorded in databases such as FloraBase or NatureMap. The Clearing Footprint has been designed to excise *E. praecox* individuals from the Clearing Footprint and protect these plants within exclusion zones with protective buffers.

A targeted regional survey (Phoenix 2025a) recorded 93 individuals of *E. praecox* across eight different land systems (BB5, Campsite, Doney, Gumland, Kanowna, Moriarty, Mx43, Yilgangi) (Phoenix 2025a). This species has also been recorded in disturbed areas and rehabilitated sites, suggesting a broader ecological tolerance than many conservation-listed flora. The current total number of known records for *E. praecox* is 785 individuals across the Goldfields region. Of these, over 28% occur within conservation reserves, including Karrawang Nature Reserve and Bullock Holes Timber Reserve (WA Herbarium, 1998).

Two *Streptoglossa cylindriceps* (unlisted) individuals were identified within the Clearing Footprint, which represents a range extension of 80 km and are potentially locally significant, despite the species having an expansive range across Australia. Up to two *Streptoglossa cylindriceps* (non-listed) may be cleared. The plants are potentially locally significant due to being a potential range extension for the species. This species occurs over an expansive range that extends throughout WA, SA and NT. Clearing these plants is unlikely to have a significant impact on the overall biological diversity in the region or the conservation of this species.

Indirect impacts to significant flora can be minimised to ALARP with the implementation of the proposed mitigation measures e.g. dust suppression, maintenance of surface water drainage, hygiene protocols and weed control. Furthermore cleared land will be revegetated in accordance with a mine closure plan, preventing the net loss of vegetation over the life of the Proposal.

**Variance Level:** Not likely to be at variance.

### **3.2 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**

Faunal assemblages and habitat values are typical of the region. Fauna habitats in the Clearing Footprint include Open Woodland, Very Open/Groved Woodland, Shrubland, and Drainage Lines, with smaller areas of Grassland and Floodplain. All these habitats are common and widespread in the Study Area and surrounding region.

The Clearing Area of up to 621 ha represents a minor proportion of fauna habitat types present within the broader 13,190 ha Study Area and region. The dominant habitat types to be cleared, Open Woodland and Shrubland, are well represented and widely distributed across the bioregion, and the Proposal is not expected to result in loss of fauna habitat considered critical for the ongoing viability of any species.

Baseline fauna surveys identified 30 significant fauna species with potential to utilise the Study Area. None of these species are restricted to or reliant on habitat within the Clearing Footprint. Two of these species have been confirmed to be residents within the broader Study Area: Malleefowl (Vulnerable) and the Inland Hairstreak Butterfly (Priority 1). The Clearing Footprint has been designed to excise significant fauna habitat and protect it within exclusion zones. Significant fauna habitat excised from the Clearing Footprint includes Malleefowl breeding habitat and nesting mounds, and IHB breeding sites and a 50 m protective buffer.

Potential impacts to Malleefowl and other Threatened fauna species were assessed by an independent environmental consultant as part of an EPBC Act self-assessment (Appendix N). The EPBC Act assessment concluded that the Proposal was unlikely to have a significant impact on any EPBC Act listed species. No clearing of Malleefowl breeding habitat is proposed, and while 621 ha of Malleefowl foraging and/or dispersal habitat will be cleared, these habitats are common and widespread throughout the Study Area and broader Goldfields region. The proposed clearing will only reduce the regional availability of Malleefowl habitat by 0.08%, which is not likely to have a significant impact on the species.

A detailed risk assessment was conducted by the leading expert on the Inland Hairstreak Butterfly, considering all aspects of the Proposal, including clearing (Appendix M). The impact assessment considered potential impacts associated with construction and operations of the Proposal. The impact assessment determined that proposed habitat loss presents a low risk to the species provided clearing is not conducted within 50 m of the IHB breeding sites. Additional controls will be implemented to ensure potential indirect impacts to IHB are minimised. These include hygiene protocols to prevent introduction of meat ants, dust suppression, maintenance of surface water drainage etc.

Potential for short-ranged endemic fauna was also considered and clearing of high potential SRE habitat will be minimised. High potential SRE habitat corresponds with drainage lines. Clearing these habitats will be minimised as far as practicable. It is anticipated that up to 20 ha of this habitat type will require clearing, which represent about 3.2% of the high potential SRE habitat in the Study Area. Given the low proportion of high potential SRE habitat requiring clearing, it is unlikely the Proposal will have a significant impact on SRE fauna.

Potential fauna interactions, disturbance and indirect impacts from degradation of habitat associated with vegetation clearing will be ALARP with the proposed mitigations, which include minimising fugitive emissions such as dust, noise and light, enforcing speed limits during construction, maintaining drainage and preventing the introduction of pest species.

**Variance Level:** Not at variance

### **3.3 Principle (c)**

**Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.**

No Threatened flora species listed under the BC Act or EPBC Act have been recorded within the Clearing Footprint or broader Study Area. No Threatened flora species will be impacted by this Proposal.

**Variance Level:** Not at variance.

### **3.4 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.**

No TECs listed under the BC Act or EPBC Act have been recorded within the Clearing Footprint or broader Study Area. No TECs will be impacted by this Proposal.

**Variance Level:** Not at variance.

### **3.5 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.**

Broad-scale (1:250,000) pre-European vegetation mapping identifies three vegetation associations occurring within the Clearing Footprint:

- Vegetation Association 20: Low woodland; mulga mixed with *Allocasuarina cristata* and *Eucalyptus spp.*
- Vegetation Association 468: Medium woodland; salmon gum and goldfields blackbutt
- Vegetation Association 1294: Low woodland; mulga mixed with *Allocasuarina cristata* and *Eucalyptus spp.*

All three vegetation associations retain a very high proportion of their pre-European extent with:

- Vegetation Association 20: more than 99.7% remaining at all scales
- Vegetation Association 468: more than 97.8% remaining across all scales
- Vegetation Association 1294: 96.0% remaining State-wide and 91.7% within the LGA

National objectives and targets for biodiversity conservation in Australia have a target to prevent clearance of ecological communities with an extent 30% of that present pre-1750, below which species loss appears to accelerate exponentially at ecosystem level (Environment Australia, 2001; EPA, 2000 and 2008).

Clearing approximately 621 ha of vegetation within the 2,262 ha Clearing Footprint will not reduce the extent of any of these vegetation association below this threshold. All vegetation associations will continue to have more than 96% of their pre-European extent remaining at a Statewide level following implementation of the Proposal.

**Variance Level:** Not at variance.

### **3.6 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.**

No permanent or semi-permanent wetlands are mapped or recorded within the Clearing Footprint. The landscape is characteristic of the semi-arid Eastern Goldfields and East Murchison region, where surface water features are generally limited to ephemeral drainage lines that flow only after significant rainfall.

Several minor, ephemeral drainage lines occur within the Clearing Footprint. These are typically defined by subtle depressions or shallow channels. These features do not support riparian vegetation distinct from the surrounding landscape, nor do they support water-dependent ecosystems. Vegetation in these areas is consistent with the broader vegetation units (e.g. Eucalyptus and Casuarina woodlands, shrublands) and does not exhibit structural or floristic characteristics typical of wetland or riparian environments.

There are no groundwater-dependent ecosystems (GDEs) within the Clearing Footprint (Phoenix, 2025a).

The Proposal has been designed to minimise clearing of vegetation associated with drainage lines. It is anticipated that up to 20 ha of vegetation associated with ephemeral drainage lines will be required. This does not represent significant or water-dependent vegetation.

**Variance Level:** May be at variance.

### **3.7 Principle (g)**

**Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.**

The Clearing Footprint is located within a semi-arid environment characterised by low to moderate rainfall, gently undulating terrain, and soils predominantly comprising red-brown earths and sandy loams. These landscape features are typical of both the Eastern Goldfields and East Murchison IBRA subregions. Soils sampling and analysis shows the soils present are relatively stable and unlikely to be dispersive, typically with an Emerson class of 4.

There are no characteristics of the local environment that suggest vegetation within the Clearing Footprint would be particularly susceptible to degradation. However, the Goldfields experiences a dry climate with unpredictable rainfall, accordingly wind and water borne erosion will need to be managed. This will be mitigated with the application of standard industry practices for dust and surface water management.

**Variance Level:** Not likely to be at variance.

### **3.8 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.**

The Clearing Footprint is not located within or adjacent to any conservation reserves. The nearest conservation reserve is the Kalgoorlie Arboretum, located 3.8 km west of the Clearing Footprint. The closest ESA is located approximately 53.5 km north-west of the Clearing Footprint. Given the separation distances between the Clearing Footprint and these conservation areas, the proposed clearing is not expected to impact the environmental values of any adjacent or nearby conservation area.

**Variance Level:** Not at variance.

### **3.9 Principle (i)**

**Native vegetation should not be cleared if the clearing of native vegetation is likely to cause deterioration in the quality of surface or underground water.**

No permanent watercourses, wetlands, or groundwater-dependent ecosystems have been identified within or immediately adjacent to the Clearing Footprint. Watercourses in the region are ephemeral and only flow following infrequent, high-intensity rainfall events.

The surface water assessment conducted by AQ2 identified potential hydrological impacts such as increased runoff from solar panels, erosion risks, chemical contamination from construction activities, and minor disruptions to natural drainage caused by access tracks. However, these risks are generally rated as low or medium and can be effectively mitigated through design measures like constructing access tracks at grade or with culverts, using non-erosive materials beneath solar panels, and implementing spill management protocols.

The report concluded that the Proposal poses limited hydrological risks, and with appropriate mitigation strategies, the environmental impacts can be managed to acceptable levels. There are no characteristics of hydrology with significant environmental risks which cannot be reasonably managed within operations.

There is no known groundwater-dependent vegetation or sensitive aquifers identified within the Clearing Footprint. The proposed Clearing Footprint is not located within any Public Drinking Water Source Areas or other groundwater protection zones.

The Proposal involves only shallow surface disturbance, with excavation limited to less than 10 m, and groundwater is typically 35 mbgl. As such, there will be no interaction with groundwater resources from proposal related activities.

Based on these considerations, the proposed clearing is unlikely to cause deterioration in the quality of surface or underground water.

**Variance Level:** Not at variance.

### **3.10 Principle (j)**

**Native vegetation should not be cleared if the clearing of native vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.**

Flood modelling was conducted as part of the surface water assessment conducted by AQ2 (Appendix B). The surface water modelling and analysis identified that surface water drainage and potential changes to flooding intensity could be adequately mitigated by incorporating suitable infrastructure into the Proposal design. These design considerations include road design and integration of suitable culverts and drains.

Given the scale of clearing the proposed and surface water drainage infrastructure incorporated into the Proposal design, the proposed clearing is not expected to significantly alter surface water flow patterns or increase the risk, frequency, or intensity of flooding on-site or in downstream areas.

**Variance Level:** Not at variance.

## 4 Environmental Management

The Proposal has been developed to manage potential impacts to the environment using a risk-based approach and applying the mitigation hierarchy of avoid, minimise, rehabilitate and offset. This management approach is consistent with the EPA mitigation hierarchy (EPA, 2023). Northern Star has prepared an environmental management plan that outlines how this mitigation hierarchy has been applied to all stages of the Proposal, including clearing, construction, operations, closure etc. (Appendix L).

Following completion of the baseline environmental and heritage surveys, the Proposal design has been refined to avoid and minimise environmental impacts as much as practicable. This iterative process was holistic in terms of modifying WTG locations, solar farm layout and technology, access roads alignment and cable routes etc. and resulted in 15 different revisions of the Proposal design.

The combined modifications to the Proposal were focused on maximising avoidance of impacts to environmental and social values, at the cost of approximately \$19M additional CAPEX and \$4.6M additional OPEX (associated loss of 36,745 MWh per annum) for the life of the Proposal. This iterative design process has resulted in a total of 54 Exclusion Zones excised from the Clearing Footprint to protect environmental and social values.

### 4.1 Avoid

The primary mechanism for preventing environmental impacts associated with the Proposal has been avoidance. Significant environmental and social values that were avoided during the iterative design process include:

- Malleefowl (Vulnerable) breeding habitat and nesting mounds
- Inland Hairstreak Butterfly (Priority 1) breeding shrubs
- *Eremophila praecox* (Priority 2)
- Aboriginal cultural heritage sites

Up to 54 Exclusions Zones were incorporated into the Proposal design to prevent direct disturbance to significant environmental and social values, and to minimise potential indirect impacts.

Exclusion Zones established included:

- **Malleefowl** - A 50 m buffer has been applied to Malleefowl nesting mounds. This is consistent with fauna management conditions applied to other Clearing Permits for projects in the Goldfields, such as CPS 8000/2, which requires the Permit Holder to avoid clearing any vegetation within 50 m if an active nesting mounds during Malleefowl breeding season. While a minimum buffer of 50 m was applied, the nearest Malleefowl nesting mound is approximately 120 m from the Clearing Footprint and the nearest active nesting mound is about 200 m from the Clearing Footprint.
- **Inland Hairstreak Butterfly**- A 50 m buffer has been applied to all IHB records in the Study Area. This was based on advice from Dr. Rod Eastwood, the leading expert on the species, and is consistent with management measures applied to other clearing proposal with potential to impact IHB e.g. Fimiston Operation (EPA Assessment No. 2354). The 50 m buffer should be sufficient to avoid direct disturbance of IHB breeding shrubs. The mitigation and management measures proposed for IHB are discussed further in the confidential butterfly impact assessed (Appendix M) and the attached EMP (Appendix L).
- **Eremophila praecox** - A minimum 10 m buffer was applied to *Eremophila praecox*. This is consistent with flora management conditions applied to priority flora in Clearing Permits for other projects in the Goldfields (e.g. CPS 8000/2, 10369/1). Where practicable, *Eremophila praecox* will be avoided by more than 10 m. In most instances it will be possible to avoid *E. praecox* individuals by at least 20 m. However, in some instances it will not be practical to avoid this species by more than 10 m.

- **Aboriginal Cultural Heritage** – avoidance of Aboriginal cultural heritage sites and the application of Exclusion Zones/buffers will be in accordance with recommendations made by the relevant knowledge holders.

#### 4.2 Minimise

Where clearing is unavoidable, minimisation measures will be implemented to reduce environmental impacts. This will principally comprise minimising the extent and intensity of clearing by limiting clearing to the authorised amount within the Clearing Footprint and strictly controlling clearing using an internal disturbance permit process.

Indirect impacts such as the degradation of vegetation and fauna habitat will also be minimised. Focus areas will include minimising fugitive dust emissions, minimising changes to surface water drainage and preventing potential sedimentation outside the proposed clearing area. All clearing will be conducted in accordance with Northern Star’s Land Disturbance procedure, which includes strict controls for how clearing is managed, such as demarcation of clearing areas and exclusion zones, and topsoil management.

Strict hygiene protocols will be implemented to prevent the introduction of exotic species, such as weeds that can displace native flora, and meat ants that can impact Inland Hairstreak Butterfly habitat by displacing host ant *F. kirbii*.

Additional controls will be implemented to reduce the chance of fauna interactions. Speed limits will be adhered to during construction. Where water dams are established, egress infrastructure will be implemented and any excavations left open for more than 24hrs will be inspected each shift.

A summary of the key minimisation initiatives is provided in Table 4-1 below. Further detail is provided in the attached EMP (Appendix L).

**Table 4-1: Minimisation Measures**

Aspect	Minimisation Measures
Clearing	<ul style="list-style-type: none"> <li>• Clearing will be minimised to the amount necessary.</li> <li>• Clearing to be conducted in accordance with an approved internal Disturbance Permit.</li> </ul>
Dust	<ul style="list-style-type: none"> <li>• Stage land clearing to minimise exposure of surface where practicable.</li> <li>• Dust suppression implemented to minimise potential indirect impacts from fugitive emissions.</li> <li>• Restrict vehicle speeds to a maximum of 40 km/hr on unsealed roads during construction to reduce dust generation.</li> <li>• Use designated access road and tracks and limit unnecessary vehicle movement</li> <li>• Ensure cleared areas are progressively stabilised or rehabilitated</li> </ul>
Hydrology	<ul style="list-style-type: none"> <li>• Surface water drainage to be maintained with appropriate surface water infrastructure e.g. drains and culverts.</li> <li>• Clearing within drainage lines will be minimised as far as practicable.</li> <li>• Excess material will be stockpiled away from drainage paths.</li> <li>• Sediment controls will be installed in areas at risk of sediment laden runoff entering water systems, where required.</li> </ul>
Biosecurity	<ul style="list-style-type: none"> <li>• Hygiene protocols to be implemented to prevent introduction of weeds into the Clearing Footprint.</li> <li>• Weed control to be implemented as needed.</li> <li>• No fill brought to the site unless certified clean.</li> </ul>
Fauna Interactions	<ul style="list-style-type: none"> <li>• Undertake land clearing in a manner that allows fauna to migrate into adjacent areas and retains landscape connectivity.</li> <li>• Use designated access road and tracks and limit unnecessary vehicle movement.</li> <li>• Restrict vehicle speeds to a maximum of 40 km/hr on unsealed roads to reduce dust generation during construction.</li> <li>• Noise and vibration will be minimised as far as practicable.</li> <li>• Clearing of high potential SRE habitat (drainage lines) will be minimised</li> </ul>

### **4.3 Rehabilitate**

Cleared areas will be rehabilitated in accordance with mine closure obligations pursuant to the *Mining Act 1978*. It is anticipated that up to 257 ha of the clearing area can be rehabilitated following construction. The remaining 374 ha will be rehabilitated at closure to a state consistent with the post mining land use.

During clearing activities, topsoil and native vegetation will be stockpiled. Topsoil will be carefully stripped and stockpiled separately to preserve its biological and physical properties for use during rehabilitation. During rehabilitation cleared vegetation may be mulched for use in revegetation.

Following rehabilitation, monitoring programs will be implemented to ensure that rehabilitation outcomes meet approved performance criteria. This ongoing monitoring will enable adaptive management to address any emerging issues and support successful ecosystem recovery.

### **4.4 Offset**

The proposed vegetation clearing will not result in any significant residual impacts to the environment and therefore no environmental offsets are proposed.

## **5 Environmental Management System**

Northern Star is committed to operating the Proposal in a sustainable manner that prioritises the health and safety of the workforce, the well-being of surrounding communities, and the protection of the environment. Northern Star is dedicated to minimising adverse impacts and strives to achieve industry-leading environmental standards.

Northern Star maintains an Environmental Management System (EMS), aligned with ISO 14001, that outlines specific policies and procedures for its operations. Northern Star's environmental management philosophy is based on the principle of environmental impact mitigation, compliance and continual improvement through a risk-based approach on the management of operational aspects with inherent potential environmental risk.

Northern Star's EMS is built on the Plan-Do-Check-Act management cycle recommended by ISO 14001:2015 and facilitates a step-by-step approach to continual improvement. The Northern Star EMS has also been developed to align with the requirements of Northern Star's Corporate EMS Standard (NSR-ENV-001-STA). This Manual provides an overview of how these elements are implemented and supported by management plans, programs and procedures.

Key EMS documents relevant to this Proposal include:

- Environmental Policy (NSR-COR-003-POL)
- Environmental Standards include:
  - Environmental Management System Global Standard (NSR-ENV-001-STA)
  - Biodiversity Global Standard (NSR-ENV-005-STA)
  - Waste Management Global Standard (NSR-ENV-004-PRO)
  - Water Management Global Standard (NSR-ENV-004-PRO)
  - Incident Reporting Global Standard (NSR-OHS-008-STA)
- Environmental Procedures include:
  - Environmental Obligations & Compliance Procedure (NSR-ENV-003-PRO)
  - Environmental Incident Reporting & Investigation Procedure (NSR-ENV-002-PRO)
  - Land Disturbance Procedure (NSR-ENV-001-PRO)
  - Native Fauna Management Procedure (NSR-ENV-004-PRO)
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