



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

# **KALGOORLIE REGIONAL RENEWABLE ENERGY PROJECT**

## **Referral Supporting Document**

<b>Revision</b>	1.0
<b>Date</b>	7 November 2025
<b>Proposal</b>	Kalgoorlie Regional Renewable Energy Project
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## **Executive Summary**

Northern Star (EGP) Pty Ltd (the Proponent), a wholly owned subsidiary of Northern Star Resources Ltd (Northern Star), is proposing to develop the Kalgoorlie Regional Renewable Energy Project (the Proposal). The Proposal involves the construction and operation of a 366-megawatt wind and solar renewable energy facility with a 300-megawatt hour battery energy storage system located in proximity to Northern Star's Kalgoorlie Consolidated Gold Mines (KCGM) Operations.

Once operational, the Proposal will provide renewable energy directly to KCGM Operations and forms an integral component of reducing greenhouse gas emissions in accordance with Northern Star's Decarbonisation Strategy 2030. This Proposal will result in over 70% of KCGM's electricity supply being supplied by renewable energy with a consequent reduction of an average 336,690 tCO<sub>2</sub>e per annum over life of Proposal (58.70% reduction).

The proposed renewable energy infrastructure will be located approximately 10 kilometres (km) northeast of Kalgoorlie-Boulder on mining tenure held by Northern Star, with transmission infrastructure approaching closer to town. The site was selected due to high solar irradiance and wind energy potential, proximity to KCGM Operations, and overall environmental suitability. A Development Envelope (DE) of 2,312 hectares (ha) has been identified for the Proposal which includes an Indicative Footprint (IF) of up to 652 ha of land disturbance.

Significant baseline monitoring and site-specific studies have been undertaken over a broader 13,191 ha Study Area (SA) to develop a sound understanding of environmental and social values present and to inform the design of the Proposal. Studies include vegetation and flora surveys, fauna surveys, shadow flicker assessment, noise modelling, bird and bat monitoring, surface water assessment, electromagnetic interference study, visual and landscape assessment and an aviation impact assessment. There has been ongoing consultation with relevant stakeholders, including Native Title Claimant Traditional Owners, resulting in multiple heritage surveys and commitment to develop a Proposal specific Cultural Heritage Management Plan.

Based upon these studies, three preliminary key environmental factors have been identified that without mitigation may be significantly impacted by the Proposal:

- Flora and Vegetation - impacts to native vegetation and conservation significant flora.
- Terrestrial Fauna - impacts to fauna habitat and conservation significant fauna.
- Social Surroundings - impacts to Aboriginal cultural heritage (ACH) and surrounding landscape / land users.

These environmental impacts have been mitigated through an iterative design optimisation process, which was applied by the Proponent in accordance with the Environmental Protection Authority's (EPA) mitigation hierarchy with a primary focus on avoiding direct impacts to preliminary key environmental factors. This process has resulted in 15 re-designs to avoid potential impacts to the environmental and cultural values. While Priority flora, Threatened fauna and Aboriginal cultural heritage sites are known to occur in the broader Study Area, these environmental values have been avoided by incorporating Exclusions Zones with protective buffers into the DE.

Considerable effort has been made to minimise potential impacts that cannot be avoided completely, such as exposure of proximal vegetation and fauna to fugitive dust and noise emissions, and wind turbine interactions. This has informed the development of Proposal specific management plans which will be implemented by the Proponent, including:

- Environmental Management Plan (EMP)
- Bird and Bat Adaptive Management Plan (BBAMP)
- Cultural Heritage Management Plan (CHMP)

Progressive rehabilitation of disturbance will commence following transition into operations with about 229 ha of construction disturbance to be progressively rehabilitated, and the remaining 423 ha to be rehabilitated following decommissioning.

With the proposed mitigation measures, the Proponent considers implementation of the Proposal to be environmentally acceptable and unlikely to result in significant impacts to the environment. Contextually the Proposal is located within an expansive landscape of unfragmented native vegetation and holistic and cumulative impacts are considered to be low.

The assessment contained within this Referral Supporting Document has concluded that the Proposal meets the EPA's objectives for all preliminary key environmental factors identified and could be effectively regulated under Part V of the *Environmental Protection Act 1986* (EP Act) and the *Mining Act 1978*. Notwithstanding this, the Proposal is being referred to the EPA pursuant to Part IV of the EP Act, for the EPA to determine if the Proposal requires assessment. The environmental impact assessment for the Proposal has been summarised in Table ES-1.

Table ES-1: Environmental Impact Assessment Summary

EPA Factor and Objective	Potential Impacts (Inherent)	Mitigation Measures Adopted	Residual Impact Assessment	Environmental Outcomes
<p><b>Flora and Vegetation</b></p> <p>To protect flora and vegetation so that biological diversity and ecological integrity are maintained.</p>	<p><b>Direct Impacts</b></p> <ul style="list-style-type: none"> <li>Loss of native vegetation in predominantly good to excellent condition, including vegetation that may be locally significant due to having limited extent in the DE or providing suitable habitat to Priority Flora.</li> <li>Loss of conservations significant flora individuals.</li> </ul> <p><b>Indirect Impacts</b></p> <ul style="list-style-type: none"> <li>Fragmentation of vegetation communities within the local area.</li> <li>Degradation of vegetation condition due to fugitive dust, introduction of weeds, and changes to hydrological and fire regimes etc.</li> </ul> <p><b>Cumulative Impacts</b></p> <ul style="list-style-type: none"> <li>Cumulative loss of vegetation and fragmentation at a landscape scale.</li> <li>Cumulative impacts to conservation significant flora species.</li> </ul>	<p><b>Avoid</b></p> <ul style="list-style-type: none"> <li>Design optimisation to reduce vegetation clearing requirements.</li> <li>Exclusion of all known listed conservation significant flora from the DE.</li> </ul> <p><b>Minimise</b></p> <ul style="list-style-type: none"> <li>Implementation of EMP to minimise potential risks to Flora and Vegetation during construction activities.</li> <li>Strict control of vegetation clearing.</li> <li>Dust suppression.</li> <li>Weed hygiene and control.</li> <li>Maintenance of surface water drainage with appropriate survey water management infrastructure.</li> </ul> <p><b>Rehabilitate</b></p> <ul style="list-style-type: none"> <li>Progressive rehabilitation of temporary disturbances to restore vegetation and ecological function within the DE.</li> </ul> <p><b>Offset</b></p> <ul style="list-style-type: none"> <li>No offsets are proposed for Flora and Vegetation.</li> </ul>	<ul style="list-style-type: none"> <li>Loss of up to 652 ha of mostly good to excellent quality vegetation within the DE, with 12,538 ha of 90% good to excellent quality vegetation retained in broader SA (95% retained).</li> <li>Loss of 304.9 ha of vegetation that may provide habitat to <i>E. praecox</i> but is not critical for survival of the species.</li> <li>Loss of 0.5 ha of MsMsEpa that has a limited extent in the DE (&gt;97% retained).</li> <li>Loss of up to two individuals of <i>S. cylindraceps</i>, which is unlisted and widely distributed throughout Western Australia, South Australia and the Northern Territory, but identified as a potential range extension.</li> <li>Fragmentation of vegetation.</li> <li>Cumulative impacts of less than &lt;0.1% of each regional vegetation association, with over 96% of pre-European extent retained in each association.</li> </ul> <p>With consideration of mitigation measures adopted, the residual impact to Flora and Vegetation is not likely to be significant.</p>	<ul style="list-style-type: none"> <li>No significant changes to vegetation representation within the surrounding landscape.</li> <li>No vegetation clearing beyond the DE.</li> <li>No clearing of listed conservation significant flora.</li> <li>Progressive rehabilitation of vegetation to minimise loss of vegetation.</li> </ul>
<p><b>Terrestrial Fauna</b></p> <p>To protect terrestrial fauna so that biological diversity and ecological integrity are maintained.</p>	<p><b>Direct Impacts</b></p> <ul style="list-style-type: none"> <li>Loss of fauna habitat including conservation significant fauna habitat and short-range endemic habitat.</li> <li>Loss of conservation significant fauna.</li> <li>Bird and bat collision from WTG operations.</li> </ul> <p><b>Indirect Impacts</b></p> <ul style="list-style-type: none"> <li>Fauna habitat fragmentation</li> <li>Changes to environment including introduced fauna, hydrological regimes, bushfire regimes, etc.</li> </ul> <p><b>Cumulative Impacts</b></p> <ul style="list-style-type: none"> <li>Cumulative loss of fauna habitat and fragmentation at a landscape scale</li> </ul>	<p><b>Avoid</b></p> <ul style="list-style-type: none"> <li>Design optimisation to avoid reduce fauna habitat clearing requirements.</li> <li>Exclusion of all Malleefowl mounds and breeding habitat identified within SA from DE.</li> <li>Exclusion of all Inland Hairstreak Butterfly host plants from DE.</li> <li>Avoidance of majority (96.8%) of high potential Short Range Endemic habitat identified within SA.</li> </ul> <p><b>Minimise</b></p> <ul style="list-style-type: none"> <li>Selection of WTGs with rotor swept area with 59 m separation from ground to minimise bird and bat collision risk.</li> <li>Implementation of EMP to minimise potential risks to Terrestrial Fauna during construction activities.</li> <li>Implementation of BBAMP to minimise potential risks to bird and bat fauna from WTG operations.</li> </ul> <p><b>Rehabilitate</b></p> <ul style="list-style-type: none"> <li>Progressive rehabilitation of temporary disturbances to restore fauna habitat and ecological function.</li> </ul> <p><b>Offset</b></p> <ul style="list-style-type: none"> <li>No offsets are proposed for Terrestrial Fauna.</li> </ul>	<ul style="list-style-type: none"> <li>Loss of up to 652 ha of fauna habitat that is well represented in the broader SA (&gt;90% retained).</li> <li>Loss of 652 ha of foraging and dispersal habitat for Malleefowl, with 12,292 ha retained in broader SA (95.1% retained).</li> <li>No clearing of Malleefowl breeding habitat.</li> <li>Loss of up to 162 ha of potentially suitable habitat for Inland Hairstreak Butterfly, with 4,863 ha retained in broader SA (97% retained).</li> <li>No clearing of IHB breeding shrubs (host plants) or loss of IHB individuals.</li> <li>Loss of 20 ha of high SRE habitat (96.8% retained within SA).</li> <li>Medium risk of turbine collisions for fourteen species (11 birds and 3 bats), including three conservation significant species: Fork-tailed Swift (Migratory), Rainbow Bee-eater (Migratory) and Peregrine Falcon. Potential impacts would be localised, acute and reversible. Potential impacts will be reduced to an acceptable level through implementation of the BBAMP.</li> </ul> <p>With consideration of mitigation measures adopted, the residual impact to Terrestrial Fauna is not likely to be significant.</p>	<ul style="list-style-type: none"> <li>No significant changes to fauna diversity or fauna habitat representation within the surrounding landscape.</li> <li>No significant impacts to Malleefowl of IHB.</li> <li>Impacts to birds and bats that can be minimised through Implementation of a BBAMP.</li> <li>Progressive rehabilitation of fauna habitat to minimise loss of fauna values.</li> </ul>
<p><b>Social Surroundings</b></p> <p>To protect social surroundings from significant harm.</p>	<p><b>Direct Impacts</b></p> <ul style="list-style-type: none"> <li>Loss of Country and associated cultural values.</li> <li>Loss of culturally significant flora and fauna.</li> <li>Inadvertent damage to an ACH site.</li> <li>Permanent change to visual landscape of local area.</li> <li>Temporary access restrictions to DE.</li> <li>Minor electromagnetic interference to local area radiocommunications.</li> </ul> <p><b>Indirect Impacts</b></p> <ul style="list-style-type: none"> <li>Impacts to cultural value of surrounding landscape.</li> <li>Amenity impacts to surrounding land users (dust, noise and vibration, traffic etc.)</li> </ul> <p><b>Cumulative Impacts</b></p> <ul style="list-style-type: none"> <li>Cumulative loss of Country at a landscape scale.</li> <li>Cumulative changes to visual landscape and amenity of Kalgoorlie-Boulder.</li> </ul>	<p><b>Avoid</b></p> <ul style="list-style-type: none"> <li>Design optimisation and infrastructure selection to avoid disturbance to Country and in particular ephemeral waterways.</li> <li>Exclusion of all identified ACH sites from the DE.</li> <li>Siting of WTGs and solar farm have considered visual impacts to landscape.</li> </ul> <p><b>Minimise</b></p> <ul style="list-style-type: none"> <li>Implementation of EMP to minimise potential risk to Social Surroundings during construction activities.</li> <li>Implementation of CHMP to minimise impacts to cultural values during life of Proposal.</li> </ul> <p><b>Rehabilitate</b></p> <ul style="list-style-type: none"> <li>Progressive rehabilitation of temporary disturbances to restore Country and associated cultural values.</li> </ul> <p><b>Offset</b></p> <ul style="list-style-type: none"> <li>No offsets are proposed for Social Surroundings.</li> </ul>	<ul style="list-style-type: none"> <li>Disturbance to Country of 652 ha including up to 20 ha of waterways (ephemeral drainage lines).</li> <li>No impacts to any identified ACH sites.</li> <li>Low risk of culturally significant fauna loss (Malleefowl) and some loss of culturally significant flora individuals (Medicine Bush).</li> <li>Minor visual landscape impacts to surrounding area.</li> <li>Minor increases to local area noise emissions from WTG operation.</li> <li>Acute and localised traffic increase during short construction stage, with negligible traffic during operations.</li> </ul> <p>With consideration of mitigation measures adopted, the residual impact to Social Surroundings is not likely to be significant.</p>	<ul style="list-style-type: none"> <li>Country will remain largely intact and unfragmented in the surrounding landscape</li> <li>No more than 652 ha loss of Country within the DE.</li> <li>No direct or indirect impacts to any ACH site.</li> <li>No dust or noise exceedances at sensitive receptors.</li> <li>Visual landscape and amenity impacts will be low.</li> <li>Progressive rehabilitation of Country during operations.</li> </ul>



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## GLOSSARY

Abbreviation / Acronym	Definition
ABAB	Arid bronze azure butterfly
ACH	Aboriginal Cultural Heritage
AER	Annual Environmental Report
AGL	Above Ground Level
AH Act	<i>Aboriginal Heritage Act 1972</i>
ALARP	As Low as Reasonably Practicable
BAM Act	<i>Biosecurity and Agriculture Management Act 2007</i>
BBAMP	Bird and Bat Management Plan
BC Act	<i>Biodiversity Conservation Act 2016</i>
BESS	Battery Energy Storage System
BoM	Bureau of Meteorology
EMP	Environmental Management Plan
CHMP	Cultural Heritage Management Plan
CKB	City of Kalgoorlie-Boulder
CO <sub>2</sub> -e	Carbon dioxide equivalent
dB(A)	A weighted Decibels
DBCA	Department of Biodiversity, Conservation and Attractions
DCCEEW	Commonwealth Department of Climate Change, Energy, the Environment and Water
DE	Development Envelope
DMA	Decision Making Authority
DMPE	Department of Mines, Petroleum and Exploration
DoH	Department of Health
DWER	Department of Water and Environmental Regulation
EIA	Environmental Impact Assessment
EMI	Electromagnetic Interference
EMS	Environmental Management System
EPA	Environmental Protection Authority
EP Act	<i>Environmental Protection Act (WA) 1986</i>
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act (Commonwealth) 1999</i>
ERD	Environmental Review Document
ESA	Environmentally Sensitive Area
EZ	Exclusion Zone
GHG	Greenhouse gas emissions
GIS	Geographic Information Systems
ha	Hectares
HIA	Holistic Impact Assessment
IBRA	Interim Biogeographic Regionalisation of Australia
IBSA	Index of Biodiversity Surveys for Assessments
IF	Indicative Footprint
IHB	Inland Hairstreak Butterfly
KCGM	Kalgoorlie Consolidated Gold Mines
KWTP	Kalgoorlie Water Treatment Plant
kV	kiloVolt
LGIRS	Department of Local Government, Industry Regulation and Safety
mbgl	Meters Below Ground Level
MCP	Mine Closure Plan
MDCP	Mining Development and Closure Proposal
MGNTC	Marlinyu Ghoorlie Native Title Claimants
MNES	Matters of National Environmental Significance
MRF	Mining Rehabilitation Fund
MRWA	Main Road Western Australia
MW	Mega Watt
NGER	National Greenhouse and Energy Reporting Act 2007
Northern Star	Northern Star Resources Ltd
NVCP	Native Vegetation Clearing Permit
OOTMP	Oversize Overmass Transport Management Plan

<b>Abbreviation / Acronym</b>	<b>Definition</b>
PEC	Priority Ecological Communities
PMST	Protected Matters Search Tool
PPS	Parkeston Power Station
The Proponent	Northern Star EGP Pty Ltd
The Proposal	Kalgoorlie Regional Renewable Energy Project
PV	Photovoltaic (solar cell)
RSA	Rotor Swept Area
RSD	Referral Supporting Document (this document)
SA	Study Area
SRE	Short Range Endemic
SWIS	South West Interconnected System
TDS	Total Dissolved Solids
TEC	Threatened Ecological Communities
TSF	Tailings Storage Facility
WA	Western Australia

## 1 Introduction

### 1.1 Purpose and Scope

This Referral Supporting Document (RSD) has been prepared to support referral of the Kalgoorlie Regional Renewable Energy Project (the Proposal) to the Environmental Protection Authority (EPA) pursuant to Section 38 of the *Environmental Protection Act 1986* (EP Act). This RSD has been prepared in alignment with the EPA's *Instructions: Referral of a proposal under section 38 of the Environmental Protection Act 1986* (EPA 2024) and includes:

- Section 2 - Proposal Overview
- Section 3 - Legislative Context
- Section 4 - Stakeholder Engagement
- Section 5 - Object and Principles of the EP Act
- Section 6 - Environmental Factors and Objectives
- Section 7 - Flora and Vegetation
- Section 8 - Terrestrial Fauna
- Section 9 - Social Surroundings
- Section 10 - Other Factors
- Section 11 - Offsets
- Section 12 - Matters of National Environmental Significance
- Section 13 - Holistic Impact Assessment
- Section 14 - Cumulative Impact Assessment

This RSD should be read in conjunction with the Referral Form and Proposal Content Document which are required to be submitted as part of the Section 38 referral process.

### 1.2 Proponent Information

Northern Star (EGP) Pty Ltd, a wholly owned subsidiary of Northern Star Resources Ltd (Northern Star), is the business unit of Northern Star responsible for the development and provision of renewable energy and is the Proponent of the Proposal. Details for the Proponent are summarised in Table 1-1.

**Table 1-1: Proponent Information**

Information	Details
Entity Name	Northern Star (EGP) Pty Ltd
Australian Business Number (ABN)	46 655 582 415
Street Address	Level 4, 500 Hay St Subiaco WA 6008
Postal Address	PO Box 2008, Subiaco WA 6904
Key Contact	Cliff Bennison Environment Manager - Approvals +61 8 9235 2945 <a href="mailto:approvals@nsr ltd.com">approvals@nsr ltd.com</a> <a href="mailto:envcompliance@nsr ltd.com">envcompliance@nsr ltd.com</a>

### 1.3 Key Terminology

Key terminology used throughout this RSD in respect of the Proposal design and layout include:

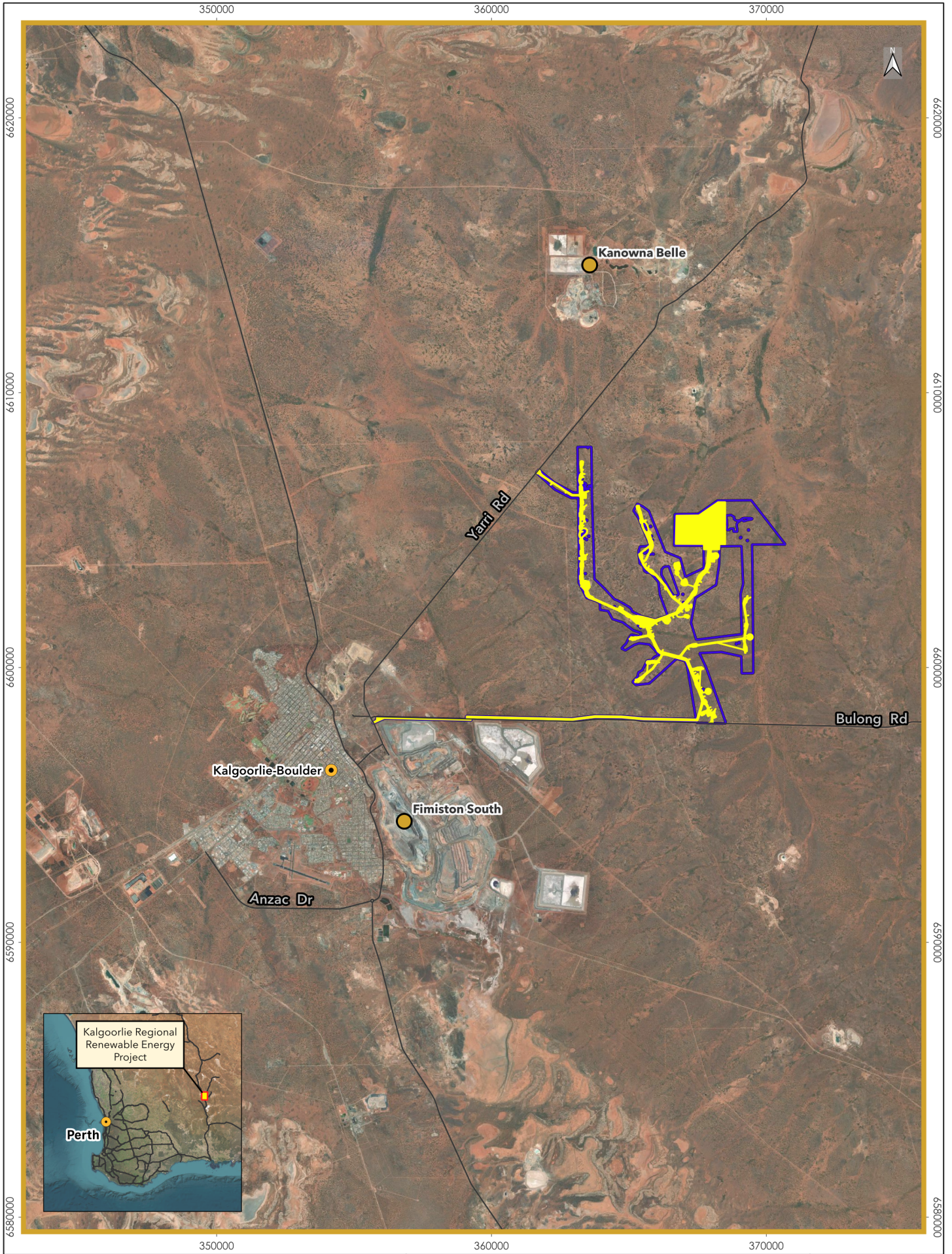
- **Study Area (SA)** - the broader area in which baseline environmental studies were undertaken to inform design (13,191 ha).
- **Development Envelope (DE)** - the area in which all disturbance will occur for the development of the Proposal (2,312 ha).
- **Indicative Footprint (IF)** - the maximum amount of disturbance within the DE for construction of Proposal infrastructure (652 ha).
- **Exclusion Zones (EZ)** - areas within the external boundary of the DE which have been excised to protect sensitive environmental or social values.

## 1.4 Development Envelope

The DE for the Proposal is located directly north-east of Kalgoorlie-Boulder in the Goldfields region of Western Australia (WA) as shown in Figure 1-1. The Proposal is situated on mining tenements wholly owned by Northern Star or subsidiary companies, as outlined in Table 1-2. It is noted that several tenements are currently pending grant. The inclusion of tenure pending grant is to enable strategic consideration of the Proposal by the EPA, noting that development cannot be implemented prior to tenure grant and regulatory approval. The mining tenure of the Proposal overlies with the Black Flag pastoral lease, which is also wholly owned by Northern Star. Tenements making up the DE are shown in Figure 1-2.

**Table 1-2: Proposal Tenure**

Tenement Number	Tenement Area (ha)	Expiry	Holder 1	Holder 2		
L 26/307 (Pending)	23.56	N/A	Northern Star (EGP) Pty Ltd	N/A		
L 26/308 (Pending)	2.74	N/A				
L 26/309 (Pending)	49.04	N/A				
L 26/310 (Pending)	3.06	N/A				
L 26/311 (Pending)	31.77	N/A				
L 26/321 (Pending)	2.59	N/A				
L 27/107 (Pending)	33.35	N/A				
L 26/297	68.96	23/10/2044	Northern Star (KLV) Pty Ltd (50%)	Northern Star (Saracen Kalgoorlie) Pty Ltd (50%)		
L 26/91	18.65	13/06/2029				
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 26/581	191.45	29/08/2033				
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			Northern Star Resources Ltd	N/A
G 27/4	2,615.91	12/08/2045				
G 27/5 (Pending)	102.61	N/A				
L 27/105	525.66	02/07/2046				

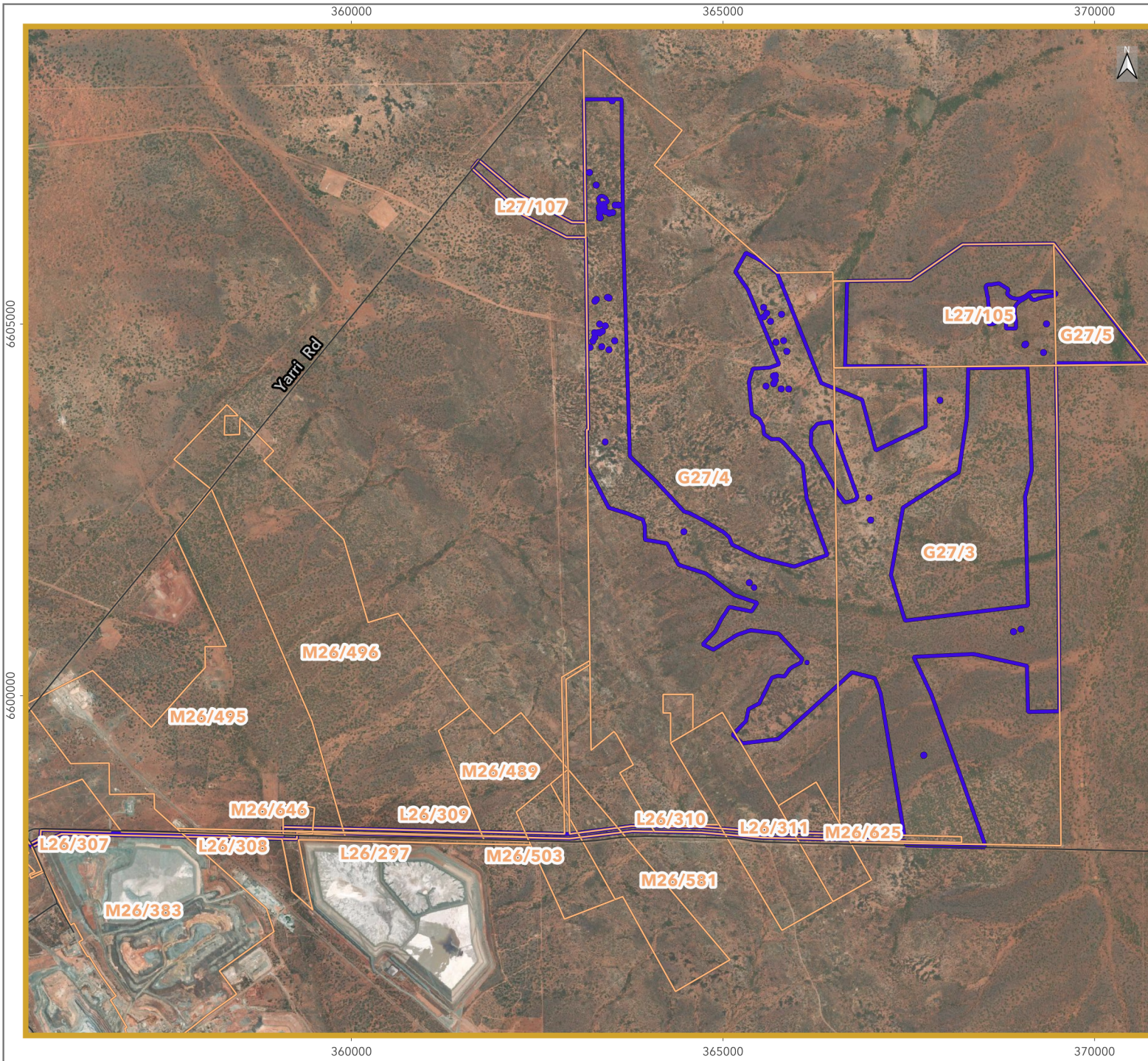


# Regional Location

Figure 1-1

- ▭ Development Envelope
- Town/City
- Roads
- ▭ Indicative Footprint
- Northern Star Resources Operations





# Proposal Tenure

Figure 1-2

- Development Envelope
- Roads
- Northern Star Tenements



Scale: 75000  
 Date: 31/10/2025  
 Author: McDonald, Lachlan R.

Coordinate System:  
 GDA2020 / MGA zone 51



## **2 Proposal Overview**

### **2.1 Background**

#### **2.1.1 Northern Star**

Northern Star is an Australian Stock Exchange listed global-scale gold producer with operations in Australia and North America across four production centres:

- Kalgoorlie Production Centre, Aus
- Yandal Production Centre, Aus
- Pilbara Operation, Aus
- Pogo Production Centre, USA

The largest of these production centres is the Kalgoorlie Production Centre, which includes the world class Kalgoorlie Consolidated Gold Mines (KCGM) operations, one of Australia's largest open pit gold mines. Northern Star acquired 50% of KCGM Operations in January 2020, and following a merger with Saracen Mineral Holdings Ltd in February 2021 Northern Star acquired the remaining 50%.

KCGM Operations includes the Fimiston open pit (Super Pit) and Mt Charlotte underground mines and the Fimiston and Gidji processing plants. Fimiston open pit sits over "The Golden Mile" of the Kalgoorlie Goldfield, one of the richest gold deposits in the world, producing more than 65 million ounces of gold over 130 years. As of March 2025, KCGM has mineral resources of 38,867 thousand ounces (koz) and mineral reserves of 14,441 koz, providing for a significant mine life (currently 2034 with potential for extension).

In June 2023, Northern Star approved an expansion to increase the mill capacity at KCGM from 13 million tonnes per annum (Mtpa) to 27 Mtpa by financial year (FY) 29 (including a 2-year ramp up), becoming one of the largest milling complexes in Australia. The mill upgrade will significantly increase the electricity demands at KCGM.

#### **2.1.2 Decarbonisation Strategy**

There is a clear and escalating demand for large scale renewable energy projects in Australia to achieve international decarbonisation goals and interim greenhouse gas (GHG) reduction targets. Industry, and in particular the mining industry can play a key role in the transition to Net Zero due to the unique position to develop large scale renewable energy projects with long term electricity demand and low associated transmission costs. Industry also has a social licence to operate based upon playing a role in the transition to net zero and are expected by stakeholders to invest in renewable energy.

Northern Star committed to a Net Zero carbon future in July 2021 and has since implemented renewable energy projects across several sites including Jundee and Carosue Dam, as well as other initiatives across the business. Northern Star's approach to decarbonisation includes addressing all scopes of GHG emissions:

- **Scope 1 emissions** - reducing direct emissions related to site-based activities, i.e. fleet, fixed plant, thermal power generation etc.
- **Scope 2 emissions** - reducing indirect emissions associated with power purchase (i.e. emissions associated with network electricity generation).
- **Scope 3 emissions** - better understanding and accounting for upstream (supplier) and downstream (consumer) emissions and influencing suppliers and consumers to reduce emissions.

Northern Star has set an interim decarbonisation target of a 35% reduction in Scope 1 & 2 emissions by 2030. Achieving this target will see a reduction in greenhouse gas emissions from a baseline (1 July 2020) of 931kt CO<sub>2</sub>-e down to approximately 590kt CO<sub>2</sub>-e. The primary source of GHG emissions from Northern Star's operations is thermal power supply (i.e. diesel, natural gas), and therefore the most effective way for reducing these emissions is by supplementing thermal power sources with renewable energy. This Proposal is expected to provide a significant contribution to the reduction of GHG emissions attributed to KCGM Operations and be the key to reaching the 2030 interim target.

### 2.1.3 Safeguard Mechanism

In addition to internal commitments, Northern Star has obligations to reduce GHG emissions under the Safeguard Mechanism and the Greenhouse Management Plan for the Fimiston South Expansion Project (EPA Assessment 2354). The Safeguard Mechanism requires Australia's highest GHG emitting facilities to reduce their emissions in line with Australia's emission reduction targets of 43% below 2005 levels by 2030 and Net Zero by 2050.

## **2.2 Justification**

The Southwest Interconnected System (SWIS) is Western Australia's main electricity network, covering the state's south-western region from Kalbarri to the north to Albany in the south, and to Kalgoorlie in the east. It is a geographically isolated grid that serves the vast majority of the state's population and industry through the Wholesale Electricity Market (WEM). The SWIS is comprised of many different types of electricity generation including both commercial thermal and renewable facilities, as well as domestic rooftop solar.

In 2024, design and feasibility stages of a renewable energy hub to support KCGM Operations commenced. The goal was to replace reliance on thermal (fossil fuel) electricity sourced from the SWIS and Parkeston Power Station (PPS), with consideration of increased electricity demands associated with the Fimiston mill upgrade and underground development.

Parkeston Power Station (PPS) is a 105 MW dual-fuelled facility that uses natural gas delivered via the Goldfields Gas Pipeline and diesel stored on-site as a backup fuel. PPS is co-owned by Northern Star and TransAlta (operator). PPS was commissioned in 1996 and supplied the entire demand of KCGM during its first 10 years of operation. More recently, Northern Star has obtained access to transmission capacity to service the current demand of the operations and PPS has reduced its role to a standby supply for KCGM when the grid is not available. PPS also reinforces electricity supply in the Kalgoorlie area through its connection to the SWIS.

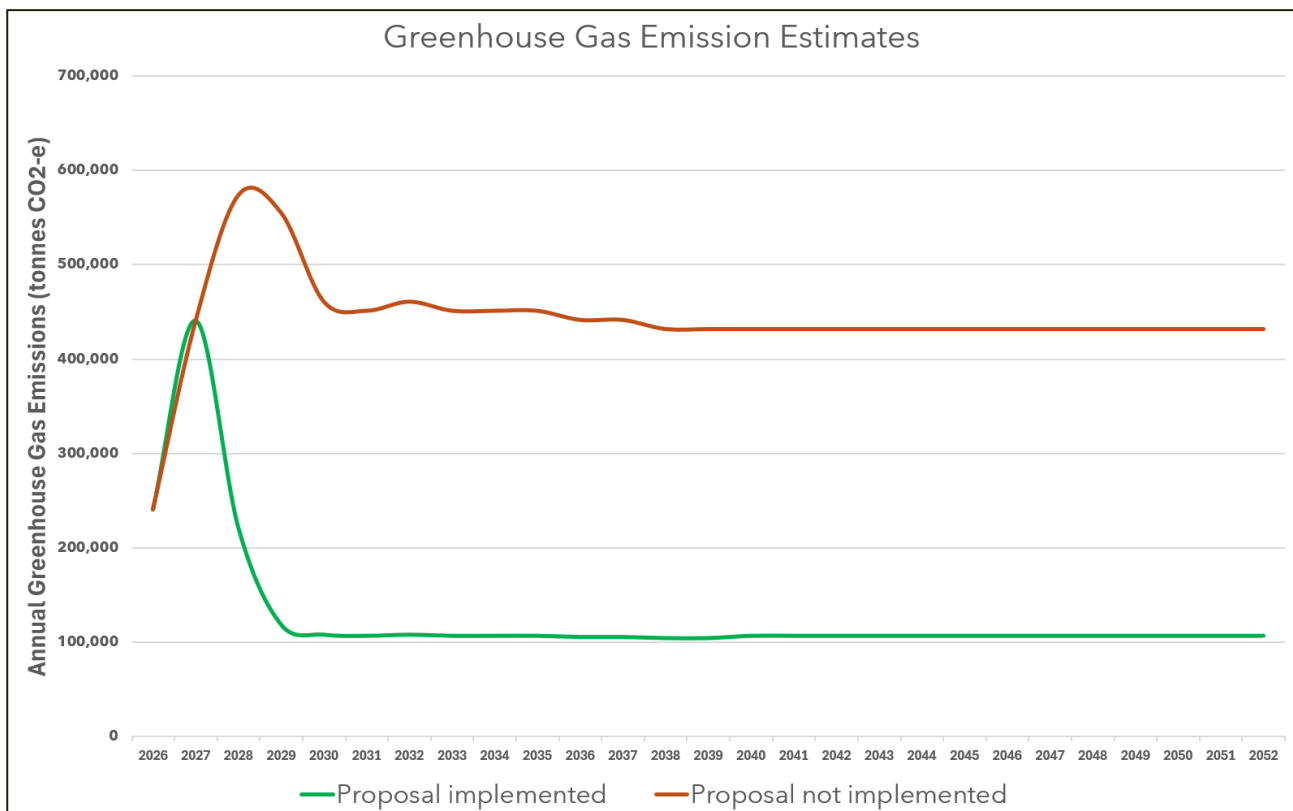
In 2024, design and feasibility stages of a renewables project to support KCGM Operations commenced. The goal was to significantly reduce reliance on thermal (fossil fuel) electricity sourced from the grid and PPS. With the Fimiston mill upgrade and underground development more than doubling the demand for electricity of the operations, combined with restrictions (constraints) on the transmission system supplying electricity from the South West to the Eastern Goldfields.

Northern Star could not rely on the greening of the grid to achieve its emission reduction targets. Without the renewables project KCGM's demand for electricity can only be supplied with increased supply from PPS. Consequently Northern Star put plans in place to directly reduce its emissions associated with electricity consumption of KCGM, it's biggest energy consumer. Northern Star forecasts that once the Proposal is fully operational KCGM's electricity supply from renewable energy will exceed 70% of its entire consumption. Key benefits resulting from the implementation of the Proposal have been summarised in Table 2-1.

Emissions modelling has been undertaken to demonstrate the potential reduction in GHG emissions from the current status quo with no renewables in comparison to implementing the Proposal, as shown in Plate 2-1. This modelling includes the Fimiston mill upgrade and potential underground development, highlighting the significant increase in emissions from FY26 to FY29 without the Proposal. This has taken into account the planned reduction in SWIS Emissions intensity as forecast by the Department of Climate Change, Energy, Environment and Water (DCCEEW) emissions projects (2024) and other power projects at KCGM.

**Table 2-1: Proposal Benefits**

Benefit	Description
Direct reduction in GHG emissions	<ul style="list-style-type: none"> <li>Significant predicted reduction in Scope 1 + 2 emissions of average 336,690 tCO<sub>2</sub>e per annum over life of Proposal (58.70% reduction).</li> <li>Total net predicted reduction in Scope 1 + 2 emissions for life of Proposal of approximately 8,417,255 tCO<sub>2</sub>e down to 3,475,987 tCO<sub>2</sub>e .</li> </ul>
Indirect reduction in GHG emissions	<ul style="list-style-type: none"> <li>Reduced upstream Scope 3 emissions associated with fossil fuel extraction required for network generation.</li> </ul>
Reduced grid reliance	<ul style="list-style-type: none"> <li>Reduces demand on the SWIS and PPS networks for other new and existing customers.</li> </ul>
Electrical reliability	<ul style="list-style-type: none"> <li>Security of electricity supply and lower overall costs will provide certainty for long term investment in KCGM.</li> <li>Reduces reliance on external fluctuations (pricing and supply) and resultingly improves certainty for future mine planning and investment.</li> </ul>
Economic benefits	<ul style="list-style-type: none"> <li>Allows for sustained long term employment of KCGM workforce by providing low-cost long-term reliable electricity.</li> <li>Construction expected to require up to approximately 300 workers over 24-month period.</li> <li>Ongoing operational and maintenance requirements for life of Proposal of approximately 10 personnel workforce.</li> <li>Decommissioning and rehabilitation requirement with associated workforce increase.</li> </ul>



**Plate 2-1: KCGM GHG Emissions Estimates (Proposal Implemented vs Proposal Not Implemented)**

### 2.2.1 Proposal Alternatives

Options for effective implementation of a large-scale renewable energy facility are constrained by a need to locate the facility close to existing mining operations and transmission infrastructure. Numerous baseline studies, investigations and monitoring activities have been undertaken to understand the environmental and social values within the broader SA, and to identify the best location to balance project outcomes with environmental and social impacts, resulting in development of the DE. Alternatives considered for the Proposal are detailed in Table 2-2.

**Table 2-2: Proposal Alternatives**

Alternative	Description
Not implementing the Proposal	Not implementing the Proposal will result in considerable increases in GHG emissions associated with the KCGM mill upgrade and mine development. This will result in an inability for Northern Star to meet interim and possibly long term GHG reduction commitments and Safeguard Mechanism requirements, as well as make it more difficult for the Australian government to achieve its international GHG reduction obligations. Not implementing the Proposal is considered unviable.
Alternative locations	<p>The siting requirements for the Proposal include:</p> <ul style="list-style-type: none"> <li>• Siting close to high demand energy users (KCGM Operations) and existing power infrastructure.</li> <li>• Consistent and optimised wind yield and solar irradiance.</li> <li>• Road access for transport of WTGs.</li> <li>• Separation from surrounding sensitive receptors.</li> </ul> <p>Whilst Northern Star operates multiple mining projects, KCGM is by far the largest and has the highest associated energy demand. Implementing the Proposal at other Northern Star sites will not achieve the decarbonisation outcomes that are required to achieve interim GHG reduction targets. Proximity to KCGM has been the primary driver for the broad site selection.</p> <p>An initial solar location adjacent to the Trans-Australian Railway was considered. However, a glint and glare assessments indicated that reflected sunlight could cause afterimages and impair train drivers' vision, affecting railway safety and this option was discontinued.</p> <p>The SA was considered to address all siting requirements for the Proposal.</p>
Options Analysis	<p>Following selection of the SA, there have been 15 different revisions considered during the design phase. This iterative process was holistic in terms of modifying WTG locations, solar farm layout and technology, access roads alignment, cable routes and was progressively informed as environmental study and survey outcomes were received.</p> <p>Design outcomes include:</p> <ul style="list-style-type: none"> <li>• Reduction in total number of WTGs and consideration of topography and spacing in siting to minimise visual landscape impacts at expense of optimised performance.</li> <li>• WTG model selected has high separation distance from blade to ground (59 m) to minimise collision risk to birds and bats.</li> <li>• Transmission line corridor was rerouted entirely to avoid potential impacts to Malleefowl breeding habitat and Aboriginal cultural heritage sites.</li> <li>• Solar array selection has considered the total disturbance requirements of various options (i.e. fixed axis vs tracking axis).</li> </ul> <p>The combined modifications to the DE and IF 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 DE to protect environmental and social values.</p>

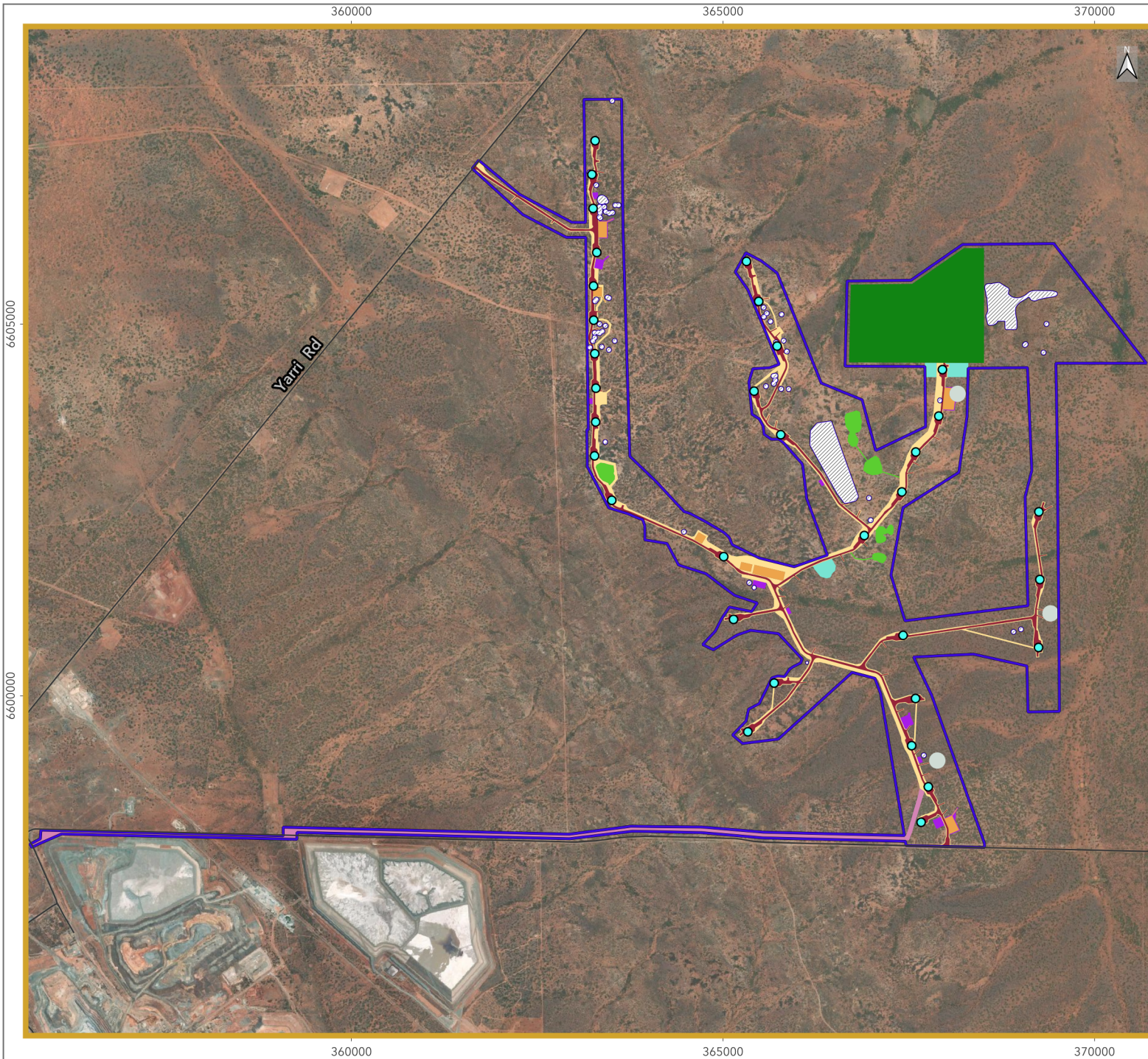
### 2.3 Proposal Description

The Proposal includes a 256 MW<sub>AC</sub> wind farm and a 110 MW<sub>AC</sub> solar farm, with a total hybrid production capacity of 366 MW<sub>AC</sub>. The hybrid renewable farm is supported by a 300 MW hour battery energy storage system (BESS) to store and discharge surplus electricity. The Proposal consists of the components detailed in Table 2-3 with the indicative layout shown in Figure 2-1.

**Table 2-3: Proposal Components**

Proposal Component	Description	Indicative Footprint (ha)
Renewable energy infrastructure	<ul style="list-style-type: none"> <li>• Wind farm</li> <li>• Solar farm</li> <li>• BESS</li> <li>• Supporting infrastructure (substation, cabling, offices, etc.)</li> </ul>	355.0
Transmission infrastructure	<ul style="list-style-type: none"> <li>• Underground transmission line between Proposal and existing KCGM transmission infrastructure.</li> </ul>	68.0
Temporary infrastructure	<ul style="list-style-type: none"> <li>• Construction compound and laydown areas</li> <li>• Temporary workers accommodation (provisional)</li> <li>• Stockpile areas</li> <li>• External site access</li> <li>• Internal access roads</li> <li>• Office and Utilities.</li> </ul>	229.0
<b>Total</b>		<b>652.0</b>

\* Minimal impact (<0.1 ha) from transport trimming along existing roads not included in calculations.



# Indicative Layout

Figure 2-1

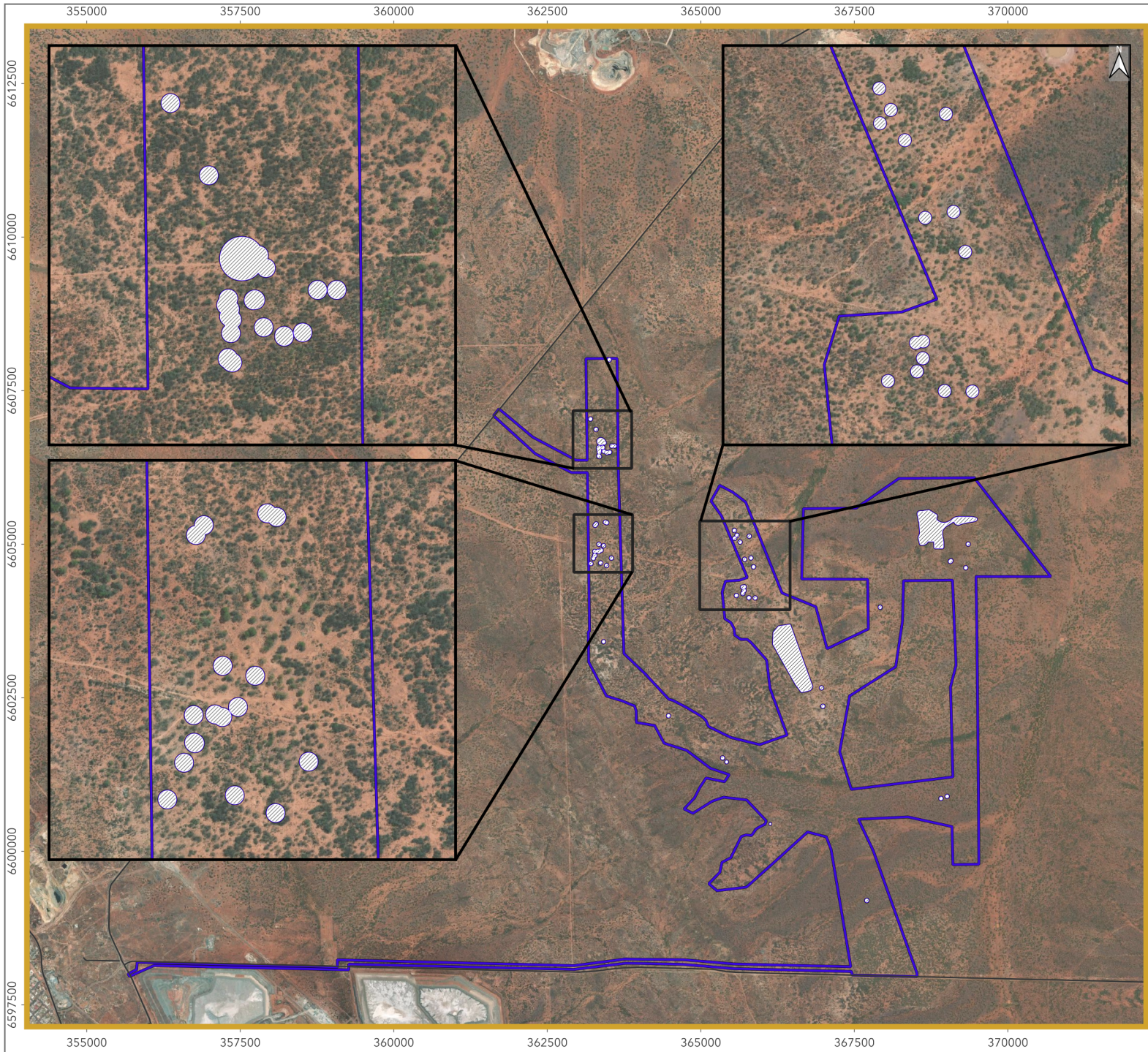
- Development Envelope
- Roads
- Exclusion Zones
- Indicative Footprint**
- Laydown
- Masts
- Solar
- Wind Turbine and Supporting Infrastructure
- Borrow Pit
- Laydown
- Supporting Infrastructure/Borrow
- Temporary Infrastructure Construction
- Transmission Line
- Potential Wind Turbine Locations

0 1 2 km

Scale: 75000  
 Date: 31/10/2025  
 Author: McDonald, Lachlan R.

Coordinate System:  
 GDA2020 / MGA zone 51

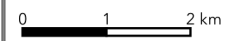




# Exclusion Zones

Figure 2-2

- Development Envelope
- Roads
- Exclusion Zones



Scale: 90000  
 Date: 31/10/2025  
 Author: McDonald, Lachlan R.  
 Coordinate System:  
 GDA2020 / MGA zone 51



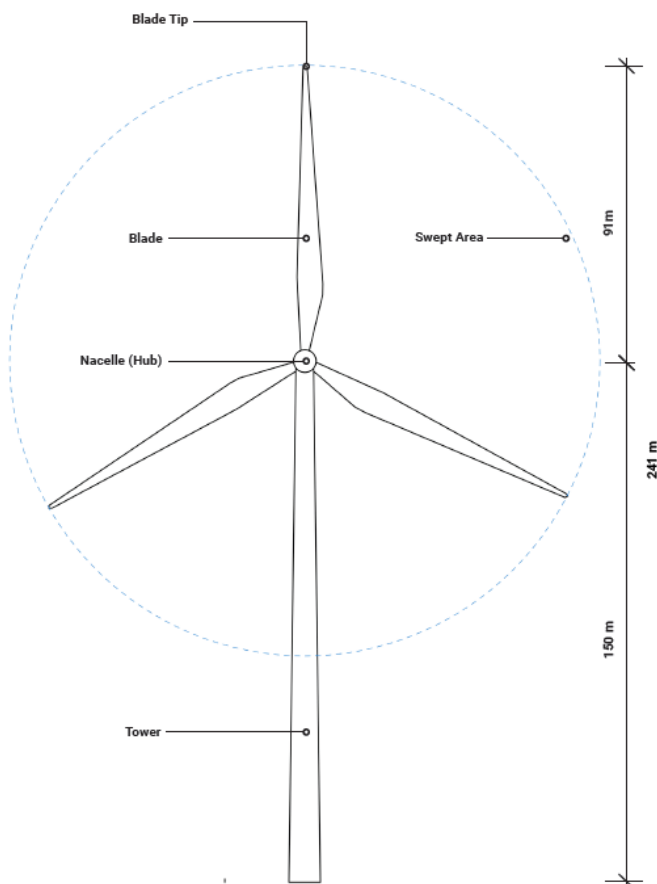
### 2.3.1 Renewable Energy Infrastructure

#### 2.3.1.1 *Wind Farm*

The proposed wind farm includes up to 32 wind turbines generators (WTG), capable of each producing up to 8 MW<sub>AC</sub>. WTG have a hub height of 150 m from which three 91 m blades extend at 120° from each other. The rotor swept area (RSA), the vertical range in which blades rotate, has been assessed from 59 m above ground level (mAGL) to 241 mAGL, representing a full range of 182 m blade rotation. The operation of WTGs can be controlled on an individual to allow for environmental controls such as curtailment, and each WTG is equipped with lightning protection systems.

Each WTG will be installed on reinforced below ground concrete foundations with approximate dimensions of 20 m x 20 m. The final dimensions and design of each foundation will be determined based on structural loading requirements, ground conditions, construction methodology, and drainage considerations. Construction of the WTG foundations will require the excavation of surface soils and soft overburden until either rock, or a firm stratum is reached.

WTG components will be delivered to the DE by road train from the port of Geraldton and assembled onsite. Assembly is relatively straightforward given all components are prefabricated and each component will be craned into place. WTGs are designed for an operational lifespan of approximately 25 years (maximum 30 years). Plate 2-2 provides a schematic of the basic WTG design selected for the Proposal, demonstrating the RSA of approximately 26,000 m<sup>2</sup>.

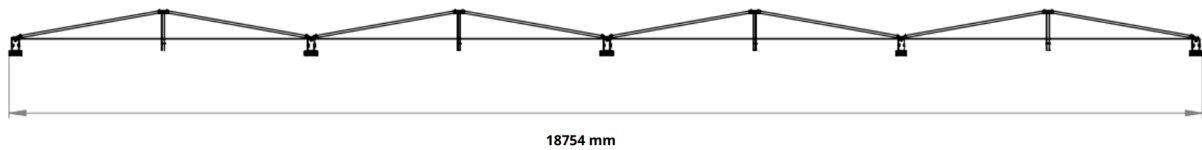


**Plate 2-2: WTG Schematic**

### 2.3.1.2 Solar Farm

The solar farm will be contained within a single location, situated in the north-eastern portion of the DE. The solar farm consists of prefabricated, ground mounted fixed tilt solar system. This system can be installed on a reduced cleared area as opposed to the alternative single axis tracking system and reduces construction impact due to shorter implementation timeframes. An earthen pad may be built (up to 300 mm) below solar panels to protect infrastructure from flooding and electrical damage. Drainage will be managed in the design of the solar farm to redirect flows around the west and east of the solar farm area back to the natural downstream flow path to the north of the DE.

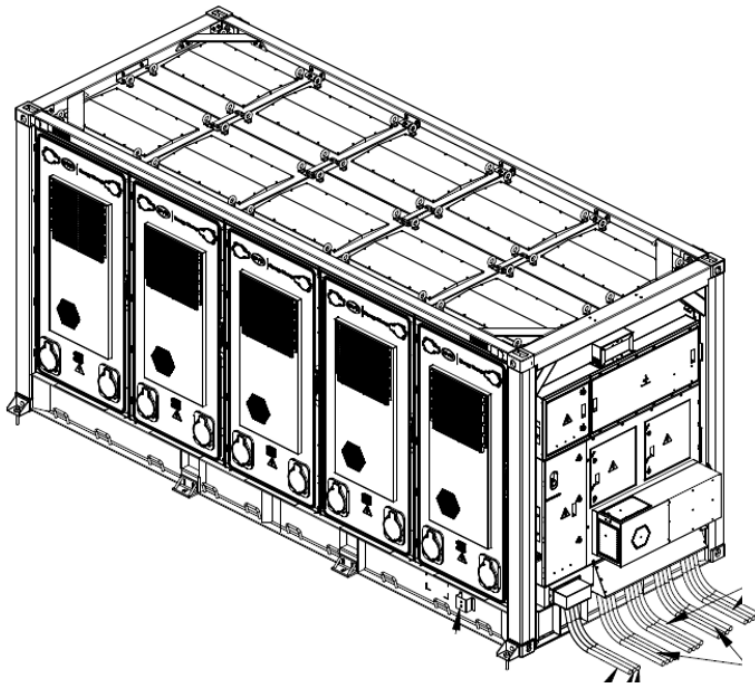
#### Deployed Configuration



**Plate 2-3: Solar 5B Maverick Schematic**

### 2.3.1.3 BESS

The BESS will be a modular containerised solution, containing LFP (Lithium Iron Phosphate) batteries, inverters, medium-voltage transformers, and modular buildings housing switchgear and control cabinets. All equipment will be installed on permanent foundation designed with appropriate drainage and stormwater management systems. Cabling will connect the BESS to the substation. To manage potential fire risks, the BESS is equipped with self-sufficient fire detection and chemical fire suppression systems which limits fire propagation between individual BESS containers. The facility will be securely fenced to restrict unauthorised access.



**Plate 2-4: Typical BESS Container**

#### 2.3.1.4 Supporting infrastructure

Supporting infrastructure refers to permanent infrastructure which is ancillary to the primary infrastructure (wind farm, solar farm, BESS). Supporting infrastructure includes a substation, Operation and Maintenance building, meteorological masts, communications tower, internal access roads, security fencing and firebreaks.

#### 2.3.2 Transmission infrastructure

The transmission infrastructure consists of a central substation (including a switch room and transformers), 33kV reticulation cables and 132kV transmission cables. Both the 33kV and 132kV cables will be buried underground with no permanent surface-based infrastructure above these cables. The 33kV underground cables will connect the wind, solar and BESS infrastructure to a central substation and the 132kV transmission line will predominantly run parallel to Bulong road for 12km and connect the substation to the KCGM internal grid. The transmission line will cross Bulong road via directional underground drilling (approximately 5 m deep) with no impacts to the road reserve. The transmission lines will tie into the network in the vicinity of Black street and Bulong road.

#### 2.3.3 Temporary Infrastructure

Temporary infrastructure refers to infrastructure required for the construction phase of the Proposal, but not for the operational phase of the Proposal, including a concrete batching plant to produce concrete for construction activities, laydowns for WTG delivery and crane assembly, construction offices and utilises, internal access roads, turkeys nest and standpipe for construction water (and potential pipelines), topsoil stockpile areas, mobile crushing and screening plant etc.

## 2.4 Proposal Timing

The Proposal is planned to occur over five stages including construction, commissioning, operations, decommissioning and closure for an indicative timeframe of 44 years. The operational stage will occur over a minimum timeframe of 25 years, based on infrastructure planned lifespan, and may be extended via maintenance and refurbishment. Description of activities associated with each Proposal stage are summarised in Table 2-4.

**Table 2-4: Indicative Proposal Schedule**

Proposal Stage	Description	Indicative Timeframe
Construction	<ul style="list-style-type: none"> <li>• Mobilisation</li> <li>• Native vegetation clearing and topsoil stripping / stockpiling</li> <li>• Earthworks</li> <li>• Concrete batching and laying foundations</li> <li>• Transport of WTG</li> <li>• Establishment of infrastructure</li> <li>• Demobilisation</li> </ul>	2 years
Commissioning	<ul style="list-style-type: none"> <li>• Testing of infrastructure to confirm conformance with manufacturers specifications</li> <li>• Collection of data to inform adaptive environmental management</li> </ul>	6 months
Operations	<ul style="list-style-type: none"> <li>• Collection of environmental data during operations to inform ongoing adaptive management</li> <li>• Progressive rehabilitation of 229 ha temporary disturbance</li> <li>• Ongoing development of MCP including preparation of a decommissioning plan</li> </ul>	30 years
Decommissioning	<ul style="list-style-type: none"> <li>• Permanent removal of infrastructure; or</li> <li>• refurbishment / replacement of infrastructure with new model</li> <li>• Rehabilitation of operational disturbances</li> </ul>	18 months
Closure	<ul style="list-style-type: none"> <li>• Post-closure monitoring phase</li> </ul>	10 years
<b>All Phases</b>		<b>44 years</b>

#### 2.4.1 Construction

Construction activities will be managed via an Engineering Procurement Construction (EPC) arrangement whereby a principal contractor with suitable construction experience will be appointed to deliver the entire construction scope of work.

##### 2.4.1.1 *Workforce*

The construction workforce is expected to reach approximately 300 personnel over an 18 to 24-month period. Where possible, workers will be utilised from Kalgoorlie-Boulder to promote local employment and minimise demand on temporary worker accommodation. Any additional accommodation required for the construction workforce will be provided by Northern Star in existing approved facilities located offsite. During operations, the Proposal will be managed by both on-site and off-site personnel. It is expected that the Proposal will generate approximately 5-10 permanent, fulltime jobs throughout its operational life.

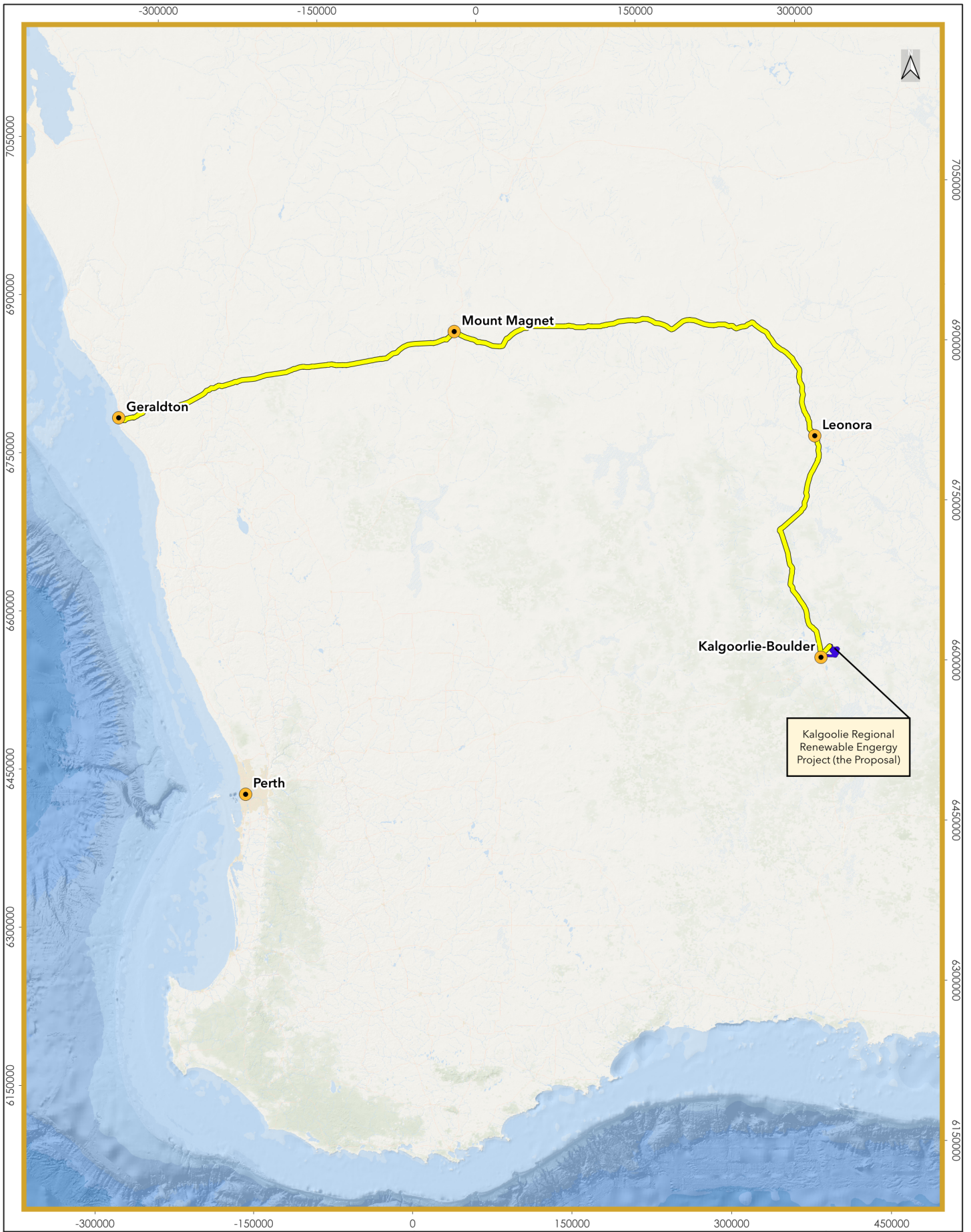
##### 2.4.1.2 *Water Supply*

A lined turkey's nest and standpipe may be constructed on site to provide water for construction activities, including dust suppression. These facilities will be used regardless of the water source. Water may be supplied from an existing KCGM pipeline, in which case a dedicated water pipeline will be installed within the proposed construction corridor for the 132kV transmission line (refer to Section 1.1.3.6). Alternatively, water may be trucked in from offsite, with the turkey's nest and standpipe used to store and distribute water on site.

##### 2.4.1.3 *Construction Traffic*

The Proposal is located northeast of Kalgoorlie-Boulder with access from the public Yarri Road and Bulong Road, which can accommodate heavy vehicle traffic. A moderate traffic increase on these public roads associated with the Proposal is expected to occur during the construction period for a period of up to 24 months. It is anticipated that most of the workforce will be housed at the accommodation village at Northern Star's regional core yard located on Speedway Road. The majority of construction traffic should therefore avoid residential areas of Kalgoorlie-Boulder.

The wind turbine blades, tower sections and smaller loads will be transported from Geraldton port to the DE via the Geraldton-Mount Magnet Road, Great Northern Highway, Mount Magnet-Sandstone Road and Goldfields Highway (RJAET 2025). The route may require trimming of planted vegetation at one location in Geraldton, removal of one tree at the Geraldton-Mount Magnet Road intersection with Gray Street, Mullewa, and less than 0.1 ha of native vegetation clearing at the corner of Goldfields Highway and Speedway Road, Kalgoorlie. The WTG transport route is shown in Figure 2-3



# WTG Transport Route

Figure 2-3

- Town/City
- Transport Route (Geraldton Port to Superpit Windfarm)
- Kalgoorlie Renewable Energy Project



**NORTHERN STAR**  
RESOURCES LTD

#### 2.4.2 Commissioning

Commissioning of infrastructure will be undertaken concurrently with construction as areas are completed and handed over. Commissioning activities are predominantly related to mechanical and electrical checks and validation to ensure that infrastructure meets design specifications and performs without technical issues. To achieve this will require running infrastructure at maximum capacity continuously to validate performance against expected performance, and where this identifies issues, rectification will occur, and validation will be re-run.

#### 2.4.3 Operations

Following successful completion of commissioning the Proposal will enter the operational stage. The Proposal will be operated under a long-term Power Purchase Agreement (PPA) contract, guaranteeing a minimum level of electricity supply and level of maintenance for the life of the Proposal. It is expected that between 5-10 dedicated staff will be responsible for managing the operations.

#### 2.4.4 Decommissioning

The expected operational life of the Proposal will be up to 30 years. Decommissioning will be implemented in accordance with a Mine Closure Plan (MCP) approved under the *Mining Act 1978*. A specific decommissioning plan will be prepared closer to the end of operations in accordance with the MCP conditions to ensure that infrastructure is decommissioned in a manner that is consistent with current practises.

The decommissioning plan is expected to involve either decommissioning the facility permanently or refurbishing the old infrastructure (e.g. turbines, solar arrays and BESS) with new upgraded models. If full decommissioning is required, the Proponent will have full responsibility for removing all infrastructure. This will include dismantling and removal of all WTGs, solar panels, BESS, and ancillary infrastructure, and rehabilitation of all disturbances including infrastructure areas, hardstands and access roads.

Infrastructure decommissioning will follow the waste hierarchy where practicable, noting that advances in technology are likely to present new avenues for reuse, recycling and recovery of infrastructure (notably solar panels, WTG and BESS).

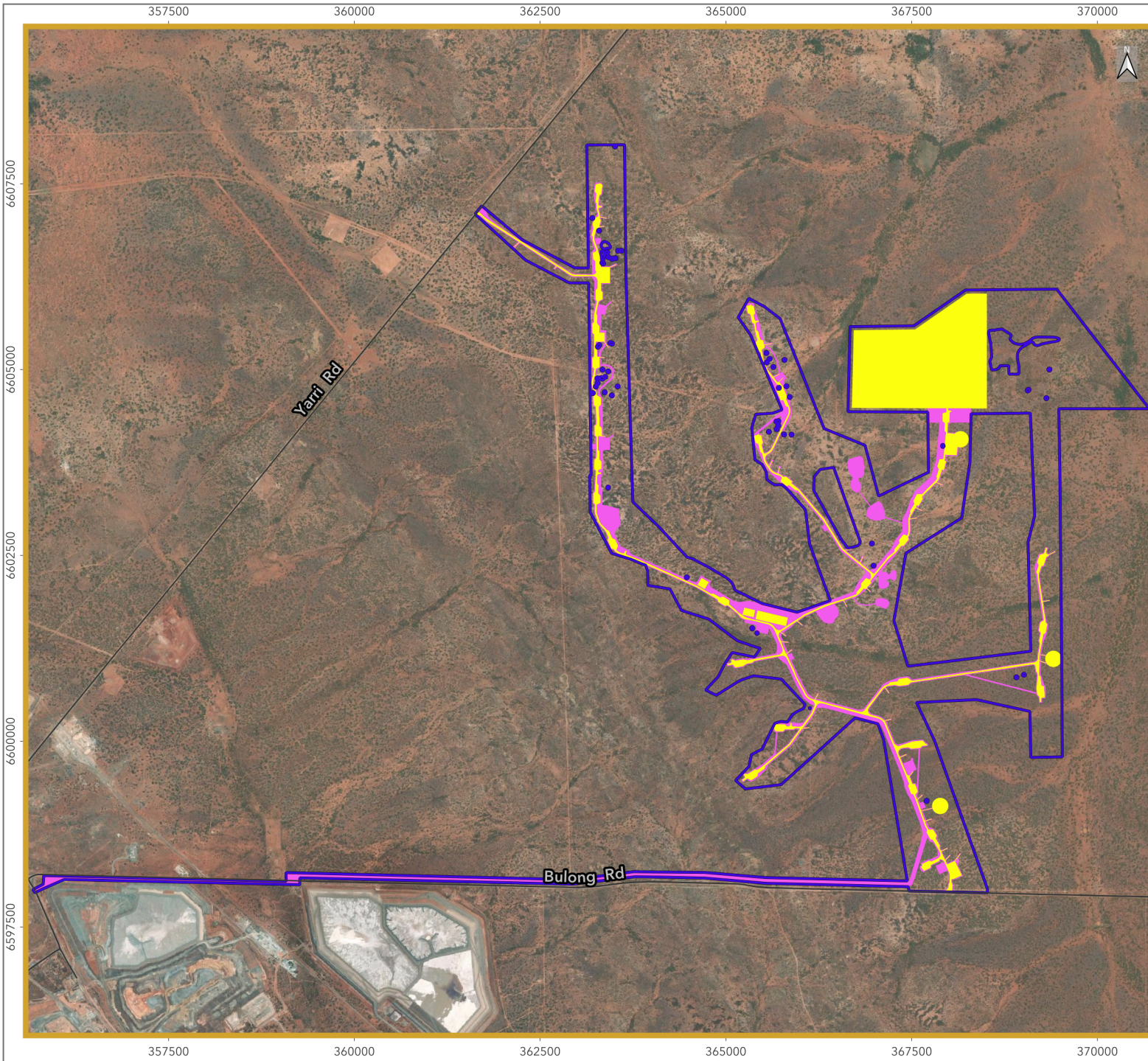
#### 2.4.5 Closure

Whilst the MCP has not yet been developed it is likely that the post-closure land use will be 'pastoral' which is consistent with other projects across the Goldfields region and current land use, with the Black Flag pastoral lease overlying the DE. Further engagement with stakeholders will inform the development of the MCP and agreed post closure land use for the Proposal.

The closure stage of the Proposal will commence following removal of all infrastructure. Remaining disturbances will be rehabilitated in accordance with the approved MCP, which will generally include:

- Respreading of topsoil and ripping to reduce compaction
- Seeding with local native species to supplement topsoil seedbank
- Establishing reference locations to monitor and track rehabilitation performance towards performance criteria
- Undertaking annual monitoring and reporting of rehabilitation performance
- Concluding the closure monitoring phase once performance criteria have been achieved

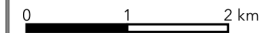
The closure phase will occur until tenement relinquishment can be delivered in accordance with achievement of performance criteria in the approved MCP. Rehabilitation by staging is shown in Figure 2-4



# Rehabilitation Areas

Figure 2-4

- Development Envelope
- Roads
- Progressive Rehabilitation Area
- Final Rehabilitation Area



Scale: 75000  
 Date: 31/10/2025  
 Author: McDonald, Lachlan R.

Coordinate System:  
 GDA2020 / MGA zone 51



## 2.5 Local and Regional Context

### 2.5.1 Climate

The Goldfields 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 with comprehensive and recent historic climate data is Kalgoorlie-Boulder Airport (no. 012038), located 6 km southwest of the Proposal area at Latitude: 30.78°S and Longitude: 121.45°E.

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.

### 2.5.2 Bioregion

The Interim Biogeographic Regionalisation of Australia (IBRA) divides Australia into 89 bioregions based on major biological, geographical and geological attributes. These bioregions are subdivided into 419 subregions as part of a refinement of the IBRA framework (Thackway & Cressdell 1995). The Proposal occurs across both the Eastern Murchison and Eastern Goldfields subregions of the Murchison bioregion.

The Eastern Murchison subregion is characterised by Cowan (2001b) as having internal drainage, extensive areas of red desert sandplains, salt lake systems associated occluded paleo drainage systems, broad plains of red-brown soils and breakaway complexes, and vegetation dominated by Mulga Woodlands often rich ephemerals; hummock grasslands, saltbush shrublands and Halosarcia (i.e. Tecticornia) shrublands.

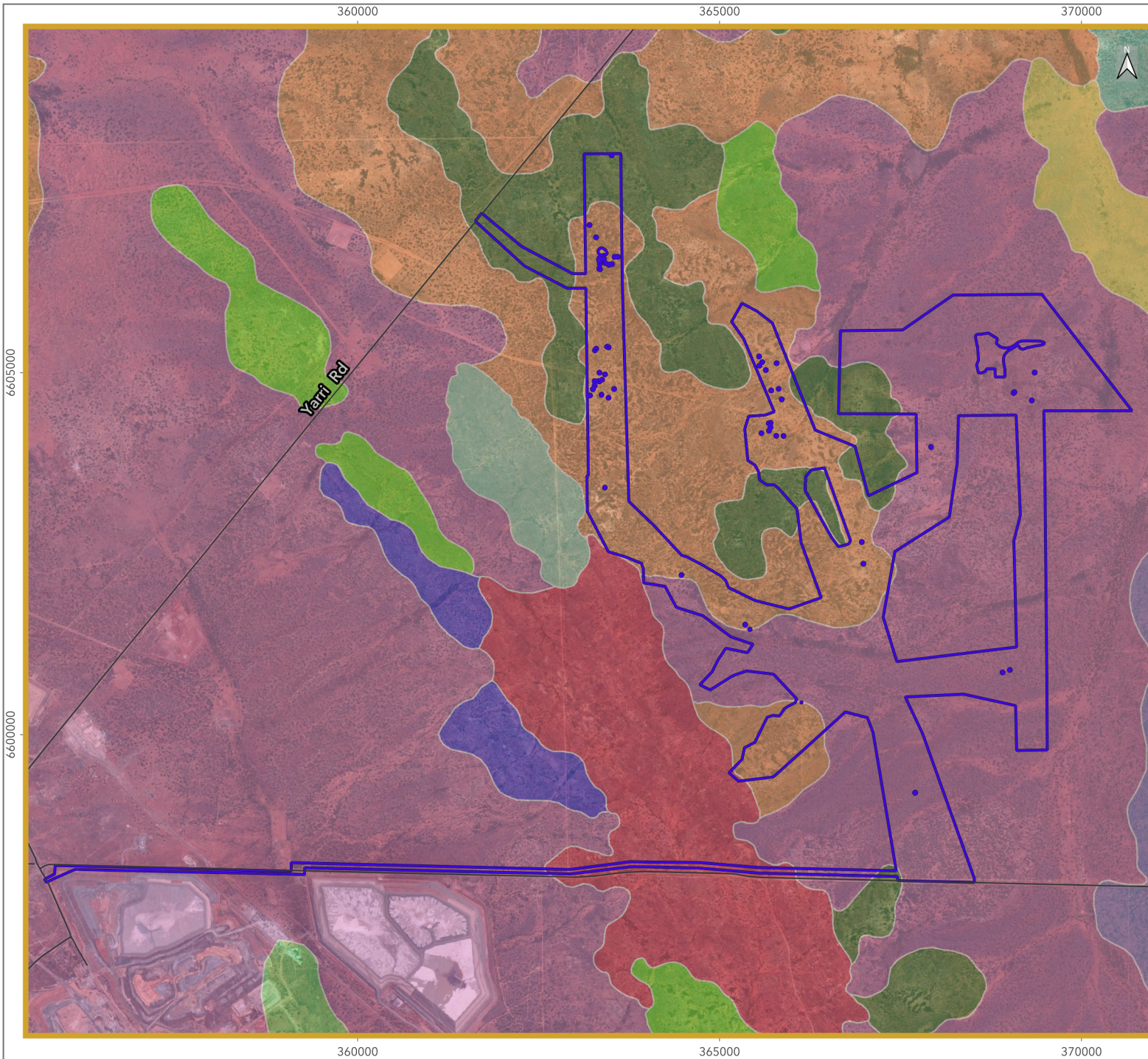
The Eastern Goldfields subregion is characterised by Cowan (2001a) as having subdued relief comprised of undulating plains interrupted by low hills and ridges in the west and a horst in the east, playa lakes associated with the remnants of an ancient major drainage line, calcareous earths that cover much of the plains and greenstone areas, and vegetation dominated by Mallees, Acacia thickets, shrubland heaths, Eucalyptus woodlands and dwarf samphire shrublands.

### 2.5.3 Land Systems

Land system mapping in Western Australia is conducted by the Department of Primary Industries and Regional Development using a nested soil-landscape hierarchy (Waddell and Galloway 2024). This mapping supports agricultural and pastoral land capability assessments and also provides valuable context for ecological and landscape-level studies. Under this hierarchy, land systems are defined as areas with recurring patterns of landforms, soils, vegetation, and drainage (Payne and Leighton 2004). The DE intersects four mapped land systems typical of the broader bioregion as detailed in Table 2-5.

**Table 2-5: Land Systems**

Land System	Description	Regional Extent (ha)	DE Extent (ha)
Gumland System	Extensive pedeplains supporting eucalypt woodlands with halophytic and non-halophytic shrub understoreys.	177,579	1,373
Kanowna System	Erosional and depositional surfaces with extensive very gently inclined to gently undulating saline stony plains supporting scattered eucalypt woodland and halophytic shrublands.	48,043	747
Kurrawang System	Low hills and ridges, with occasional plateaus and scarps, and undulating stony plains, on metasedimentary and felsic volcaniclastic rocks, supporting scattered eucalypt or casuarina woodlands	11,415	26
Zed System	Low hills, rises and gently undulating stony plains based on metasedimentary rocks supporting Acacia shrublands.	2,222	167



# Land Systems

Figure 2-5

Development Envelope

Roads

### Soil Landscape Systems (DPIRD-064)

Bunyip Land System

Gransal Land System

Gumland Land System

Helag Land System

Kanowna Land System

Kurrawang Land System

Latimore Land System

Lefroy Land System

Monger Land System

Moriarty Land System

Zed Land System



Scale: 77000

Date: 31/10/2025

Author: McDonald, Lachlan R.

Coordinate System:  
GDA2020 / MGA zone 51



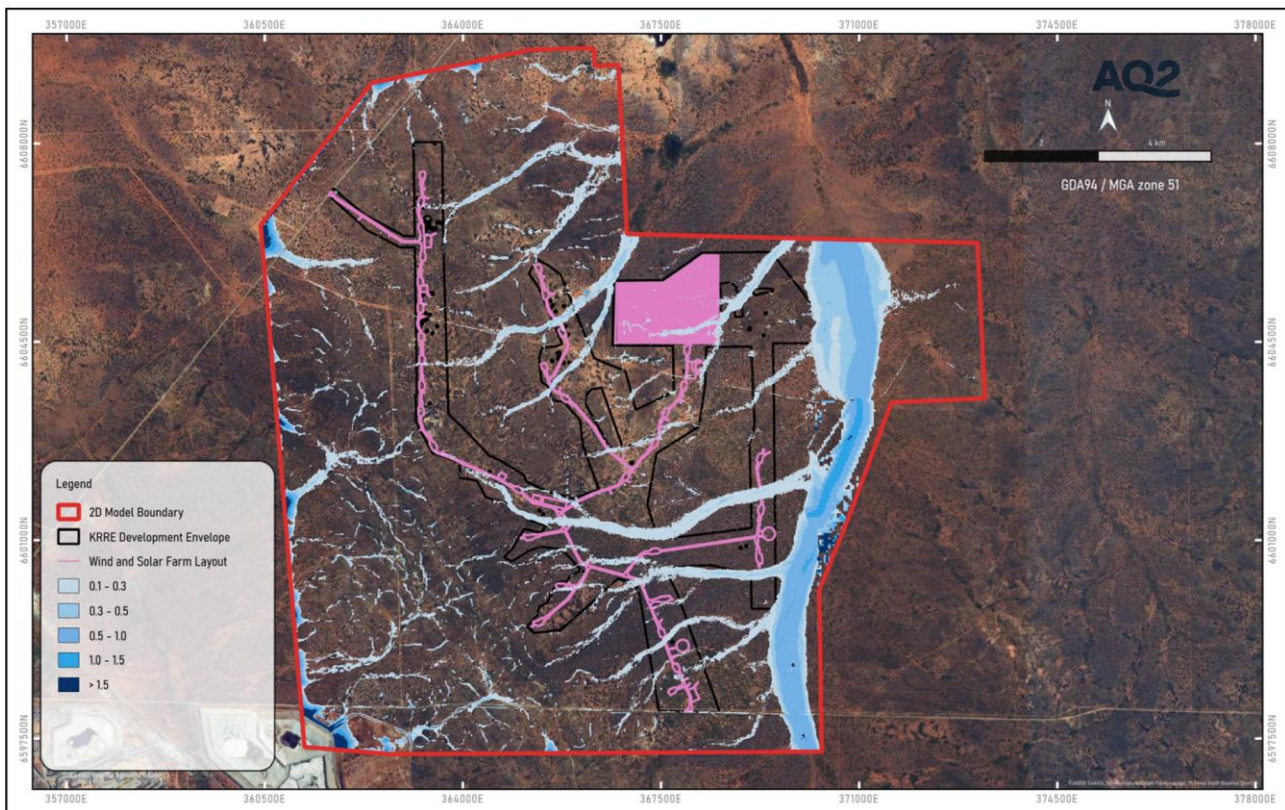
#### 2.5.4 Hydrology

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 DE. 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 DE 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 DE and is not intercepted by any Proposal infrastructure. The DE only represents a portion of flows to this main drainage channel with the inflow boundary to the south of the DE also contributing upstream flows.

Surface water flows within the DE are predominantly concentrated sheet flow within poorly defined ephemeral drainage corridors (AQ2 2025). Flood modelling for the 1% annual exceedance probability (AEP) event shows most of the DE 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).



**Plate 2-5: 1% AEP Surface Water Flows (AQ2 2025).**

#### 2.5.5 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 DE:

- 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.

#### 2.5.6 Surrounding Land Uses

The Proposal 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 City of Kalgoorlie-Boulder (CKB) include mining, pastoralism, recreation, unallocated crown land, conservation reserves, and Aboriginal traditional uses. The Proposal is situated on the Black Flag pastoral station, owned by Northern Star. Surrounding pastoral leases include Hampton Hill station, and Mt Veters station. The Hampton Hill homestead is located approximately 12 km east of the DE.

The Proposal 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 DE interacts with three reserves, R8767 (unvested), R35264 (unvested), R35662 (vested CKB, consent to mine granted). Surrounding land uses are shown in Figure 2-6.

The DE is zoned "Rural" under the CKB Local Planning Scheme (LPS) No.2. Whilst the Proposal is situated 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."

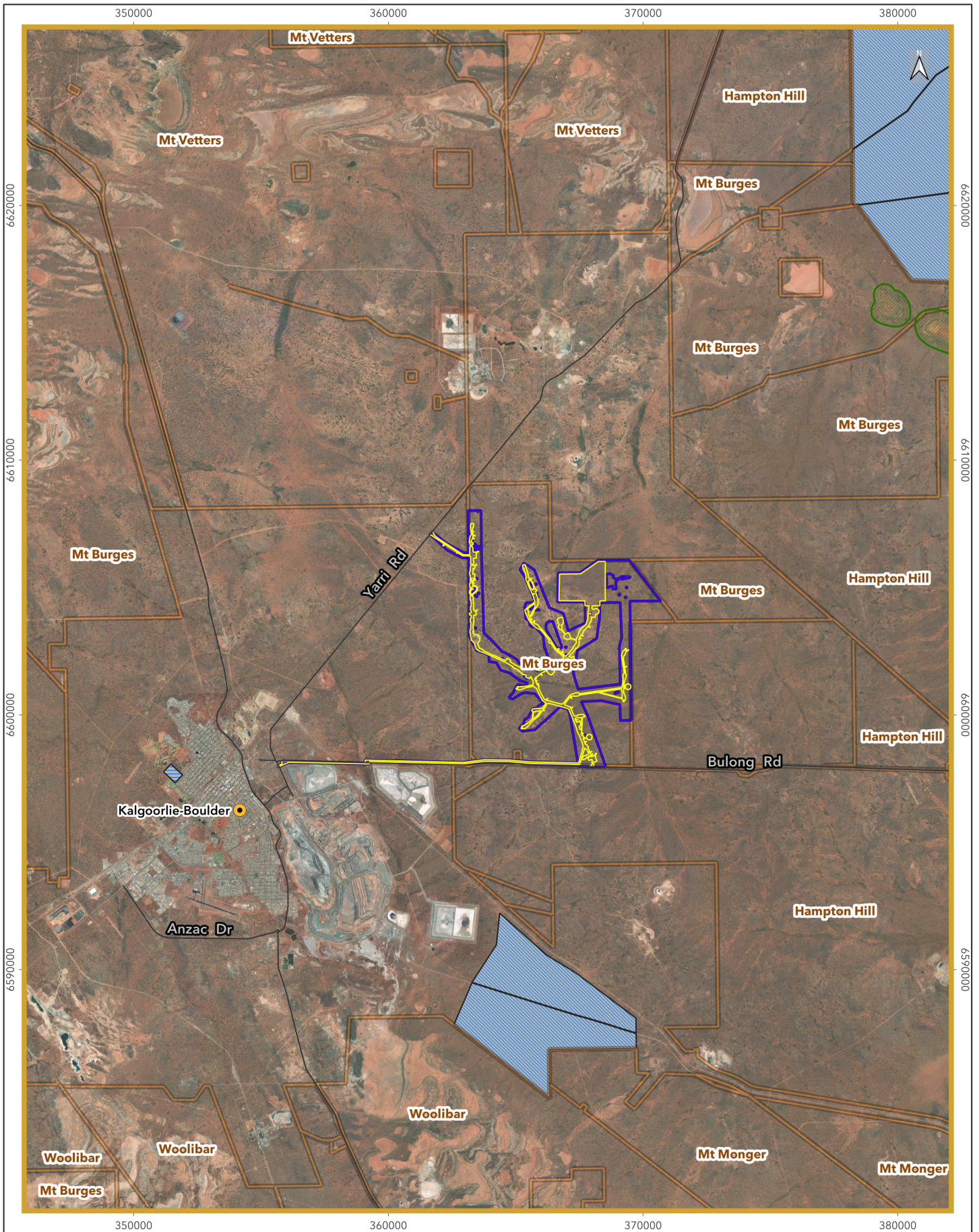
No environmentally sensitive areas (DWER-046) or legislated lands and waters (DBCA-011) are located within the DE. The nearest environmentally sensitive area is located approximately 66 km northeast of the DE, and nearby conservation reserves include Kalgoorlie Arboretum (3.8 km west), Lakeside Timber Reserve (6.0 km south) and Bullock Holes Timber Reserve (15.6 km northeast) (Figure 2-7).

A number of existing and reasonably foreseeable projects are located within 50 km of the DE and more broadly across the Eastern Goldfields region. Identification of these projects and potential cumulative impacts are discussed in Section 14.

#### 2.5.7 Native Title

There is no determined native title over any part of the DE. The Marlinyu Ghoorlie Claim (WC2017/007) was accepted for registration on 28 March 2019 and covers the entire DE. The DE was previously covered by the Maduwongga Native Title Claim (WC2017/001) which was accepted for registration on 3 August 2017 and dismissed on 28 April 2023. Prior to this there have been multiple claims over Kalgoorlie-Boulder which have been dismissed.

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 DE 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 DE sits within the consents given under that land use agreement.



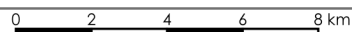
# Surrounding Land Uses

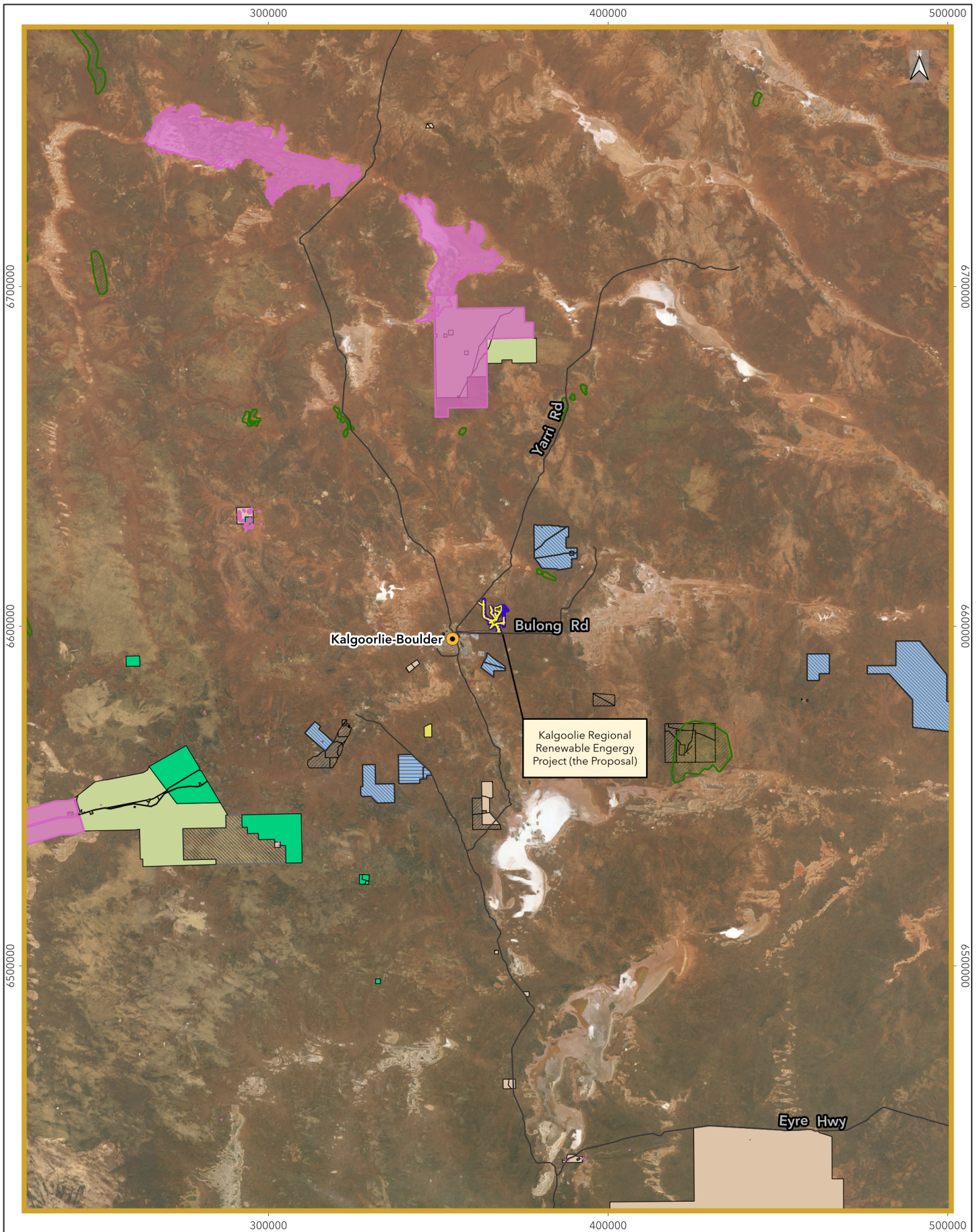
Figure 2-6

- ▭ Development Envelope
- Town/City
- Roads
- Indicative Footprint
- Priority Threatened Ecological Communities (TECs) (DBCA-038)
- Pastoral Stations (DPLH-083)
- Section 5(1)(g) Reserve
- Section 5(1)(h) Reserve



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# Environmentally Sensitive Areas

Figure 2-7

- |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
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| <ul style="list-style-type: none"> <li><span style="color: blue;">□</span> Development Envelope</li> <li><span style="color: orange;">●</span> Town/City</li> <li>— Roads</li> <li><span style="border: 1px solid yellow; display: inline-block; width: 15px; height: 10px;"></span> Indicative Footprint</li> <li><span style="background-color: magenta; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> Environmentally Sensitive Areas (ESAs)</li> <li><span style="border: 1px dashed green; display: inline-block; width: 15px; height: 10px;"></span> Priority Threatened Ecological Communities (TECs) (DBCA-038)</li> </ul> | <p><b>Legislated Lands and Waters (DBCA-011)</b></p> <ul style="list-style-type: none"> <li><span style="background-color: lightgreen; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> National Park</li> <li><span style="background-color: lightblue; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> Nature Reserve</li> <li><span style="background-color: cyan; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> Conservation Park</li> <li><span style="background-color: lightblue; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> Section 5(1)(g) Reserve</li> <li><span style="background-color: lightblue; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> Section 5(1)(h) Reserve</li> <li><span style="background-color: yellow; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> State Forest</li> <li><span style="border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> Timber Reserve</li> <li><span style="border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> Crown Land - Section 33(2)</li> </ul> |
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