Company: **CZR Resources Limited**

Project: **Robe Mesa Iron Ore Project**

Title: **Mining Proposal**

Tenements: **M08/533, L08/295, L08/297, L08/303, L08/319, L08/320, L08/321, L08/322, L08/323, L08/326**

Environmental Group Site Name:	TBD
Environmental Group Site Code:	TBD
Registration ID	120354
Date of Submission:	2 December 2024
Revision	2
Contact Person:	Stefan Murphy, CZR Resources Managing Director Stefan.Murphy@czrresources.com Office: +61 8 9468 2050

Revision and Version History

Revision numbers constitute each new registration.
Version numbers constitute amendments to revisions.

Table 1.1.1 : Revision and Version History						
Rev.	**Version**	**Date**	**Description**	**Prepared**	**Reviewed**	**Approved**
0	1	24 Aug 2023	Final, for submission to DEMIRS	FG/MC	FG/MC	SM
1	1	4 Dec 2023	Final, based on DEMIRS RFI (1) 14 November 2023	FG/LO/MC	FG/MC	SM
2	1	2 December 2024	Final, based on DEMIRS RFI (2) 27 August 2024	MC	FG/MC	SM

Information

Table 1.1.2 : Contact Information	
Proponent:	CZR Resources Limited
Address:	Suite 9, Level 3, 47 Havelock Street, West Perth WA 6005
Postal Address:	PO Box 16, West Perth WA 6872
Corporate Contact:	Stefan Murphy, CZR Resources Managing Director
Phone:	+61 8 9468 2050
Email:	Stefan.Murphy@czrresoruces.com

Report Declaration	
I declare that I am authorised to refer this proposal on behalf of CZR Resources	
Signature	
Name	Stefan Murphy Managing Director, CZR Resources
Date	2 December 2024

Mining Proposal Checklist

Table 1.1.3 : Mining Proposal Checklist						
Q No	**Mining Proposal (MP) Checklist**	**Y/N/ NA**	**Comments**	**Changes from previous Version (Y/N)**	**Page No.**	**Summary**
1	Has the checklist been endorsed by a tenement holder(s) or a senior representative authorised by the tenement holder(s), such as a Registered Manager or Company Director?	Yes	Managing Director; Stefan Murphy Table 1.1.2		2	
2	Are you the tenement holder of all tenements associated with the Mining Proposal /group site? Mining Proposals which have not been submitted by the tenement holder must include an authorisation from the tenement holder or an explanation of the company linkage to the tenement holder (e.g., for subsidiary companies).	Yes	Supplement A of this Mining Proposal contains Authorisation from the Tenement Holders		213	
3	For tenements with multiple tenement holders, have all of the other holders consented to this proposal being submitted? Mining Proposals which have not been submitted by the tenement holder must include an authorisation from the tenement holder or an explanation of the company linkage to the tenement holder (e.g., for subsidiary companies).	Yes	Supplement A ZANF – Director; Mark Creasey signed authorisation		213	
4	Have contact details for questions on the Mining Proposal been provided?	Yes	Cover Page Table 1.1.2		1, 2	
5	Are all mining operations within granted tenement boundaries or does this Mining Proposal support a lease application?	Yes,	Cover Page Table 2.1.1		1	All tenements are granted
6	Is this the first Mining Proposal submitted for these tenements? If **No**, the version number of the revised Mining Proposal must be stated on the cover and a summary of changes included	Yes	Cover Page		1	Rev 2
7	Have all tenement conditions been reviewed to ensure activities proposed in the Mining Proposal are complying?	Yes	Conditions on DEMIRS website			
8	Has a Mine Closure Plan been provided? It is a requirement that every mining proposal include a mine closure plan.	Yes	Supplement B of this Mining Proposal (Rev 1)		198	Rev 1

PUBLIC AVAILABILITY						
9	Are you aware that this Mining Proposal is publicly available?	Yes				
10	Is there any information in this Mining Proposal that should not be publicly available? If **Yes**, refer to Appendix B, section 7 of the guidelines for more information. Note: A non-confidential version of all mining proposals will be made available to the public	Yes				Supplement D – Stakeholder Register contains confidential information and is not for distribution of public review. Supplement D will be provided separately
11	If 'Yes' to Q10, has confidential information been submitted in a separate document?	Yes				
MINING PROPOSAL DETAILS						
12	Does the Mining Proposal cover page include: • Environmental Group Site name • Environmental Group Site code • company name (including telephone numbers and email addresses) • contact details • version number • date of submission.	Yes	Cover Page		1	
13	Has information regarding the Environmental Group Site (EGS) been provided in accordance with the requirements of Appendix G of the guidelines?	Yes	Section 3.1 Table 3.1.1		21	ESG # No. has not yet been provided to CZR
14	Has a disturbance table been provided in accordance with the requirements of Appendix G of the guidelines?	Yes	Table 5.1.2 to Table 5.2.11		27	
15	Has spatial data for all Mine Activity Types been provided in accordance with the specified properties and allowances (see section 3.5.3)?	Yes	Section 5.5		71	
16	Has a site plan, consistent with all spatial data and activity details, been provided? The site plan must show existing and proposed activities and other relevant information including tenement boundaries and other land tenure (e.g., Reserves and pastoral lease boundaries).	Yes	Section 5.6 Figure 5.6.1		73	
17	Do you have and maintain an Environmental Management System?	Yes	Section 11		185	
ENVIRONMENTAL LEGISLATIVE FRAMEWORK						

18	Does the Mining Proposal include a list of all relevant environmental approvals that have been sought or are required before the proposal may be implemented?	Yes	Section 6 Table 6.1.1		74	
19	Does the Mining Proposal trigger any criteria for referral to the EPA within the DMP/EPA Memorandum of Understanding?	No				
20	Has the Mining Proposal been referred to the EPA? If **Yes**, indicate date of referral in comments	No				
21	Has the proposal been deemed to not warrant formal assessment under Part IV of the EP Act, is currently under assessment by the EPA, or has been approved via a Ministerial Statement? If **Yes**, ensure details of Ministerial Statement, assessment level and/or assessment number are provided within the Mining Proposal	No	DEMIRS submission only			
22	Is a clearing permit required? If 'No' then explain why in space below	Yes	Section 6 Table 6.1.1		74	
23	If 'Yes' at Q22 then has a clearing permit been applied for?	Yes	21/06/23			
24	Is the Mining Proposal located on reserve land? If "Yes" state reserve types	No				
25	Is the Mining Proposal wholly or partially within Department of Parks and Wildlife (DPaW) managed areas?	No				
26	If 'Yes' at Q25 has DPaW been consulted?					
27	Will any threatened or protected flora and/or fauna be impacted by this proposal?	No				
28	Have the DAA/DPC 'Aboriginal Heritage Due Diligence Guidelines' been used to identify the risk of impacts to aboriginal heritage sites?	Yes				
29	If any aboriginal heritage sites will be impacted, has appropriate consent been sought under the *Aboriginal Heritage Act 1972*?	Yes	Native Title Agreement in place			
30	Does the Mining Proposal include a tailings storage facility? Mining Proposals that include tailings storage facilities must include the relevant design reports outlined in the *Guide to the preparation of a design report for tailings storage facilities (TSFs), August 2015.*	No	Dry processing only. Section 5.7		71	

31	Does the Mining Proposal include the backfilling of mine voids? If Yes, the Mining Proposal must include a Sterilisation Report.	Yes	Supplement C of this Mining Proposal		215	
32	Is the mining proposal located on pre-1899 Crown Grant lands? (not subject to the Mining Act)	No				
33	Has the construction of an airstrip been proposed? If Yes, indicate the date when Civil Aviation Safety Authority, Airservices Australia and the Local Government Authority were advised (in writing) of the proposal to construct an airstrip.	No				

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Acronyms

Table 1.1.4 : Acronyms used in Proposal	
Acronym	**Meaning**
2D / 3D	Two-dimensional / three-dimensional
ACH Act	*Aboriginal Cultural Heritage Act 2021*
AEP	Annual Exceedance Probability
AH Act	*Aboriginal Heritage Act 1972*
AHD	Australian Height Datum
ANFO	ammonium nitrate, fuel oil
APIM	API Management Pty Ltd
ASL	Above Sea Level
AWT	Above Water Table
BC Act	*Biodiversity Conservation Act 2016*
bcm	bank cubic metre
bgl	Below ground level
BoM	Bureau of Meteorology
BTAC	Buurabalayji Thalanyji Aboriginal Corporation
CaFe (%)	Calcined Fe%; calculated by Fe% (100% - LOI %) *100
CHMP	Cultural Heritage Management Plan
CID	Channel Iron Deposit
cm	centimetre
CZR	CZR Resources Ltd
DBCA	Department of Biodiversity, Conservation and Attractions
DFS	Definitive Feasibility Study
DGS Act	*Dangerous Goods Safety Act 2004*
DEMIRS	Department of Energy, Mines, Industry Regulation and Safety
DPLH	Western Australian Department of Planning, Lands and Heritage (formerly DAA)
DSO	Direct Shipping Ore
DWER	Department of Water and Environmental Regulation
EP Act	*Environmental Protection Act 1986*
EPA	Environmental Protection Authority
EPBC Act	*Environmental Protection and Biodiversity Conservation Act 1999*
FEL	Front end loader
FIFO	Fly-in Fly-out
G	General Lease
GDE	Groundwater Dependent Ecosystem
GDV	Groundwater Dependent Vegetation
GWL	Groundwater Licence
GWOS	Groundwater Operating Strategy
ha	hectare
IBRA	Interim Biogeographical Regionalisation of Australia
JORC	Joint Ore Reserves Committee (The AusIMM)
kL	kilolitre
km	kilometre
L	Litre or Miscellaneous Licence
LOM	Life of Mine

Table 1.1.4 : Acronyms used in Proposal	
Acronym	**Meaning**
m	metre
M	million
m^3	cubic metre
mbgl	metres below ground level
Mining Act	*Mining Act 1978*
MCP	Mine Closure Plan
MP	Mining Proposal
mRL	metres above RL (reduced level)
Mt	million tonnes
Mtpa	millions of tonnes per annum
MW	megawatt
N/A	Not Applicable
No./Nos.	number/numbers
NVCP	Native Vegetation Clearing Permit
NAF	Non-Acid Forming
NPI	Non-Processing Infrastructure
PAC	Port of Ashburton Consortium
PAF	Potential Acid Forming
PEC	Priority Ecological Community
PMP	Probable Maximum Precipitation
PoA	Port of Ashburton
PoA EQF	Port of Ashburton East Quay Facility
PoW	Programme of Work
PPA	Pilbara Ports Authority
PSS	Pre-Shipment Stockyard
RIWI Act	*Rights in Water and Irrigation Act 1914*
ROM	Run-Of-Mine
RRK	Robe River Kuruma
RRKCA	Robe River Kuruma Aboriginal Corporation
tpa	tonnes per annum
TSF	Tailings Storage Facility
TSV	Transhipment Vessel
UCS	Unconfined Compressive Strength
WA	West Australia
WWTP	Waste Water Treatment Plant
yr	year
ZanF	ZanF Pty Ltd
Zanthus	Zanthus Resources Ltd

1. Introduction

1.1 Scope of the Proposal

The Robe Mesa is located within the Robe Valley Channel Iron Deposits (Robe Valley **CID**), adjoining Rio Tinto's Mesa F deposit, in the West Pilbara of Western Australia (WA), within the Shire of Ashburton, approximately 200 km by road from the City of Karratha and 180 km by road from the town of Onslow (**Figure 1.2.1**).

The Robe Mesa Iron Ore project is part of a larger Yarraloola Iron Ore Project, whose ownership is a joint venture between Zanthus Resources Ltd (**Zanthus**), a wholly owned subsidiary of CZR Resources Ltd (**CZR**), which holds 85%, and ZanF Pty Ltd (**ZanF**) which holds 15%. Zanthus is the Operator of the Robe Mesa Project.

Zanthus and ZanF applied for Mining Lease Application 08/533 (M08/533) on 7 April 2021 over the area of the Joint Ore Reserves Committee (**JORC**) compliant resources and reserves (Robe Mesa Iron Ore Deposit). M08/533 is a partial conversion of Exploration Licences 08/1060 and 08/1686 under *section 67 of the Mining Act 1978*. M08/533 was granted on the 4 January 2023. Proposal location and related tenements is shown in **Figure 1.2.2**. Tenement Holder Authorisation is provided in Supplement A of this Mining Proposal.

CZR recognises the Robe River Kuruma (**RRK**) People as the traditional owners of the land that Robe Mesa is located on, and the importance to the RRK People of leaving country as close as possible to the way that it was found. Working collaboratively, CZR and RRK signed the Robe Mesa Native Title Agreement on 21 December 2022 which includes a 'live' Cultural Heritage Management Plan to ensure the parties continue to work together to develop appropriate protection and management measures for the places it contains.

CZR acknowledges that within the vicinity of the Production Tenements there are many significant cultural places of great importance to RRK People. CZR and RRK have agreed the Productive Mining area boundaries and identified No-Go-Areas which must not be entered or impacted by CZR. The area of the Robe Mesa that has been identified for Productive Mining provides for a set back from the mesa edge or buffer that must not be entered or impacted. Additionally, northern aspects of the Robe Mesa and other selected areas off the mesa, also contain No-Go-Areas.

Mining of the Robe Mesa is all above the water table. CZR will not conduct any mining below the water table. Mine waste will remain on top of the Mesa. No external waste dumps will be left upon closure, with the pit progressively backfilled with waste. These commitments of;

- maintaining a mesa edge buffer zone,
- enforcing No-Go-Areas, backfilling of pits with waste material,
- only undertaking mining above the water table, and
- the on-going collaborative engagement with the RRK people,

will ensure that the Robe Mesa Iron Ore project proactively manages environmental and cultural priorities.

The scope of this Mining Proposal (**MP**) and herein referred to as '**the Proposal**' includes:

- Introduction of construction and operation of
  - Above Water Table **(AWT)**, open pit mining on top of Robe Mesa
  - Dry crush and screen processing plant for up to 5 million tonnes per annum (**Mtpa**)
  - Ancillary infrastructure
  - Fuel Storage facility
  - Village
  - Landfill site
  - Fresh water dam
  - Transport and infrastructure corridors, drainage infrastructure and road construction activities
- Overall disturbance area of 270 hectares

The Mining Act 1978 (Mining Act) requires all mining activities to be undertaken in accordance with a MP and Mine Closure Plan (**MCP**) approved by the Department of Energy, Mines Industry Regulation and Safety (**DEMIRS**) and as such, this document has been prepared in accordance with the *DMIRS Statutory Guidelines for Mining Proposals* (DMIRS 2020 Version 4) and *Mining Proposal Guidance - How to prepare in accordance with Part 1 of the Statutory Guidelines for Mining Proposals* (DMIRS 2020 Version 4).

A MCP for this Proposal is provided in Supplement B and has been prepared in accordance with *Statutory Guidelines for Mining Proposals* (DMIRS 2020 Version 4), *Statutory Guidelines for Mine Closure Plans* (DMIRS 2020 Version 4) and *Mine Closure Plan Guidance - How to prepare in accordance with Part 1 of the Statutory Guidelines for Mine Closure Plans* (DMIRS 2020 Version 4), as required under the Mining Act. This MCP details specific closure objectives for the Proposal.

To support the Proposal, all relevant Licences and Permits, baseline surveys and technical investigations are provided as Appendices and are referenced where relevant throughout the document.

1.2 Projects that Do Not Form Part of the Proposal

1.2.1 M08-P529 Deposit

On 3 March 2023 CZR completed the acquisition of exploration tenement E08/2137 from FMG Pilbara Pty Ltd (Fortescue), a subsidiary of Fortescue Metals Group Ltd (ASX: FMG). The tenement sits immediately south of Rio Tinto's Mesa F iron ore project in the Pilbara, and is contiguous with CZR's P529 Deposit, located on the recently granted mining Licence M08/519.

The P529 Mineral Resource contains 4.2Mt at 53% Fe (59.2% Fe.ca) at a 50% Fe cut-off grade (ASX Announcement dated 9 May 2017), with a higher-grade zone extending into E08/2137. CZR has now consolidated a 1.1km strike length of the P529 deposit (collectively "Robe South"), strategically located only 5km from the Robe Mesa iron ore project.

A separate MP for the P529 deposit will be submitted in due course, and whilst it is discussed for regional context throughout this document, it does not form part of this Proposal.

1.2.2 Onslow Hub and Pre-Shipment Stockyard (PSS)

Robe Mesa Direct Shipping Ore (**DSO**) will be transported by road-train from the Proposal to the Onslow Hub along Onslow Road which will contain a Pre-Shipment Stockyard (**PSS**) L08-327, and/or directly transported to the Port of Ashburton (**PoA**).

A separate MP is being sought for the PSS and associated infrastructure and whilst it is discussed for regional context throughout this document, it does not form part of this Proposal.

1.2.3 Port of Ashburton Export Facility (PoA Export Facilty)

Robe Mesa DSO iron ore is proposed to be exported from the Port of Ashburton, via a purpose-built road-train unloader facility with storage shed, conveying and ship loading capabilities from East Quay, which will load a Transhipment Vessel (**TSV**). The facility will be built by Ashburton Link Pty Ltd which is a joint venture company comprised of CZR Resources, Miracle Iron and CSL Australia. Ashburton Link has submitted a development application to the Pilbara Port Authority (**PPA**) for the Port of Ashburton East Quay Facility (**PoA EQF)**.

A 12kt Transhipment Vessel (**TSV**) will be directly loaded, via covered conveyors, from the road train unloading facility and by front end loaders (**FELs**) from within the storage shed. The TSV will travel ~18 nautical miles west of Thevenard Island, to load a 180kt Ocean Going Vessel (OGV) bulk ore carrier, cycling around 15 times over ~10-day period, prior to the OGV departing for export to international markets. When the TSV is not at berth, road trains will discharge product into the Port shed in preparation for the next berthing.

A separate MP is being sought for the PoA EQF and associated infrastructure and whilst it is discussed for regional context throughout this document, it does not form part of this Proposal.

Figure 1.2.1 : Regional Context of Proposal Location

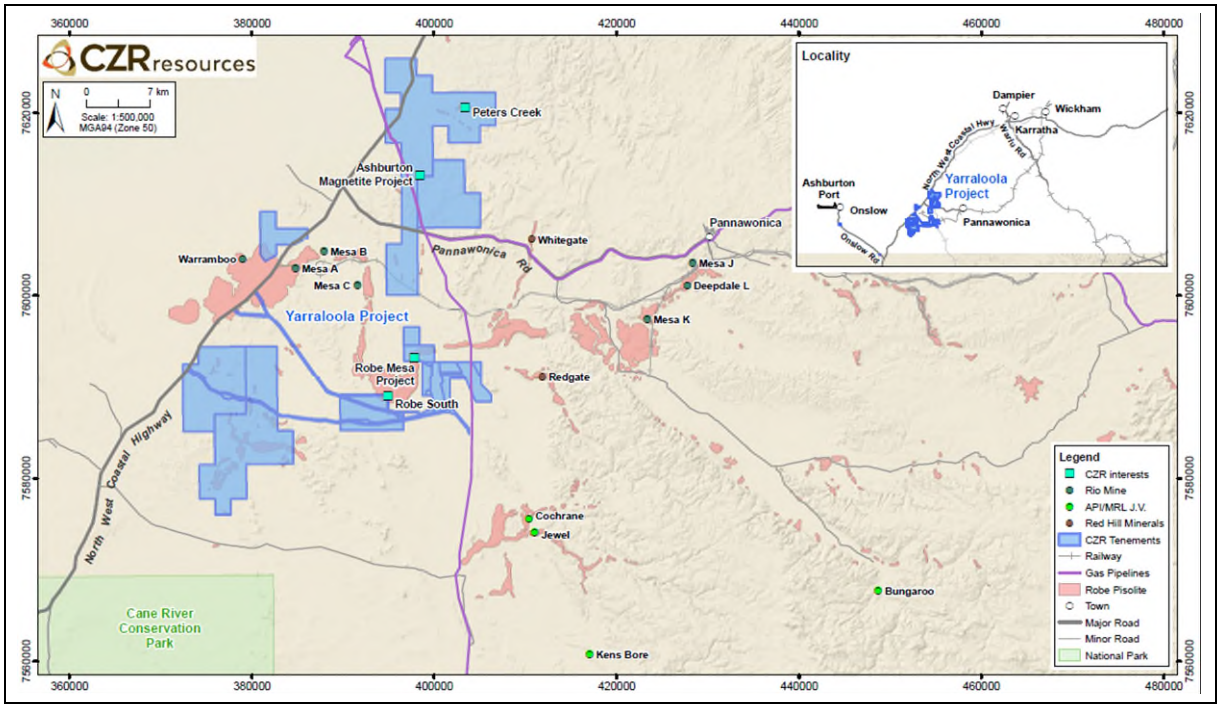
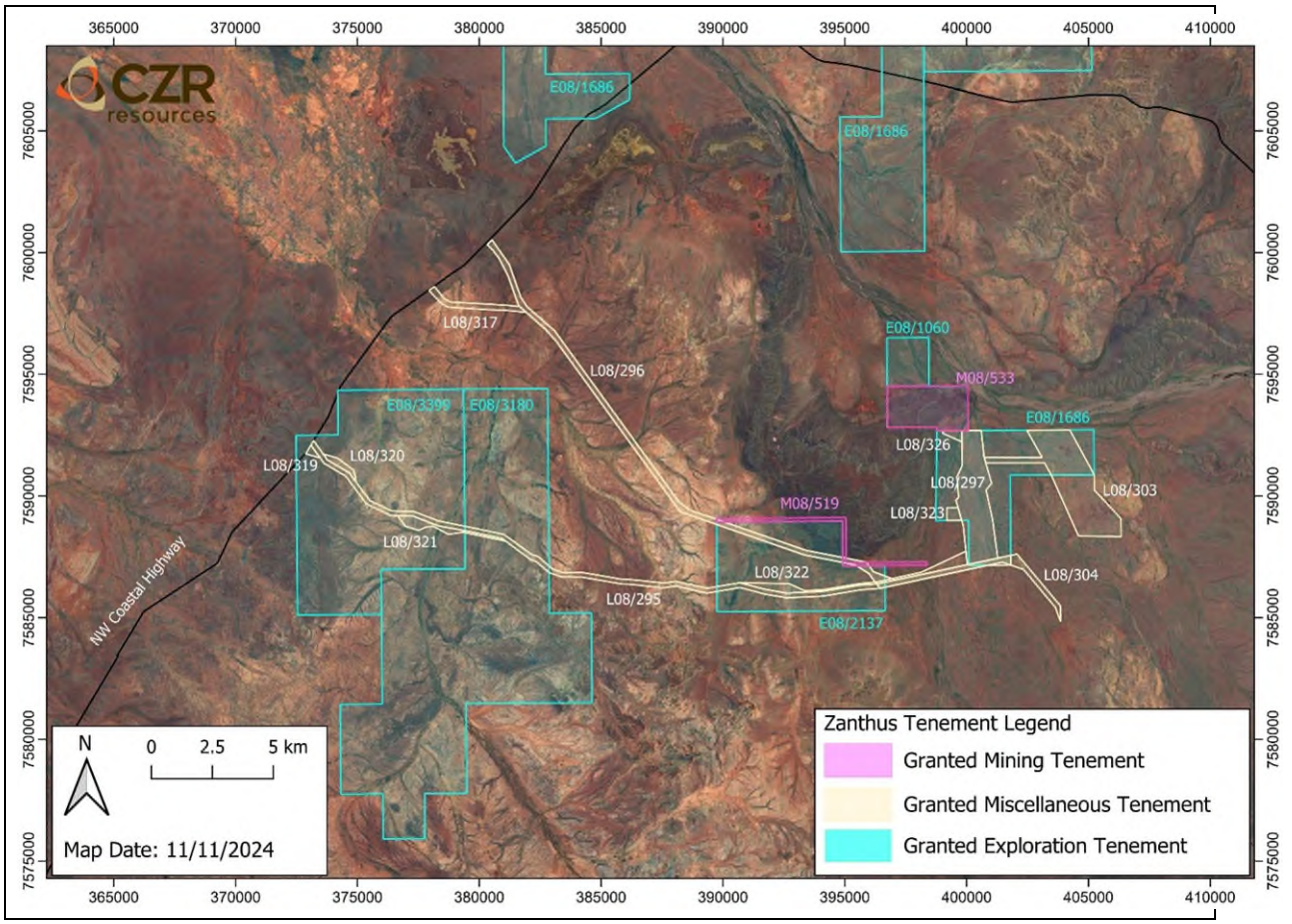


Figure 1.2.2 : Proposal Location and Tenements

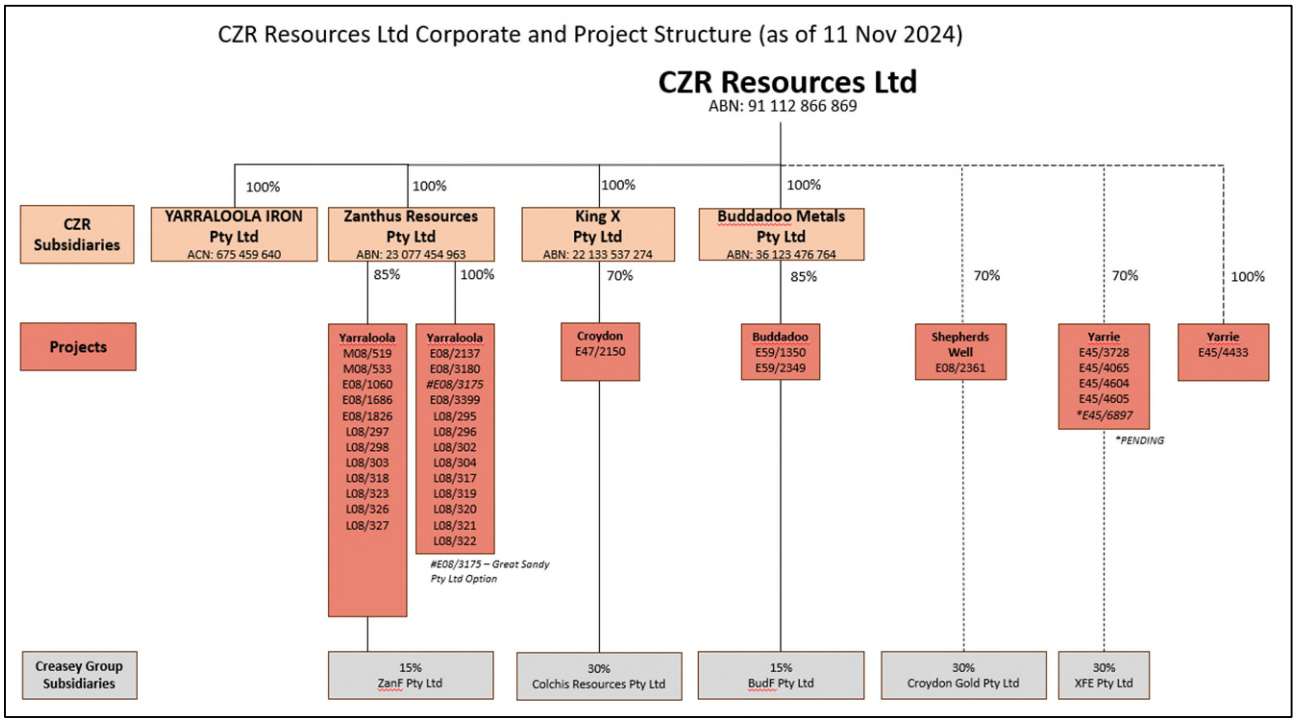


2. Tenement Holder Authorisation

2.1 Tenement Holder Authorisation

The Proponent for this Proposal is Zanthus Resources Pty Ltd (Zanthus, ACN 077 454 963, ABN 23 077 454 963) a wholly owned subsidiary of CZR Resources Ltd (CZR Resources Limited, ACN 112 866 869, ABN 91 112 866 869) and Operator of the Robe Mesa Project (the Project), which forms part of the Yarraloola Iron Ore Project, which is a joint venture between Zanthus Resources Ltd for CZR (85%) and ZanF Pty Ltd (15%, ZanF ACN 154 589 152) (**Figure 2.1.1)**

Figure 2.1.1 : CZR Resources Corporate and Project Structure



CZR is a multi-commodity exploration and development company, with a strong track record in the discovery of high quality, commercially scalable assets in Western Australia including Robe Mesa (iron ore) and Croydon (gold) deposits in the Pilbara, and the Buddadoo (gold) deposit in the Yilgarn, east of Geraldton.

The Robe Mesa portion of the Yarraloola tenement package hosts a deposit of iron-ore which is an eastern extension of the Rio Tinto-operated Mesa F orebody.

Zanthus is a wholly owned subsidiary of CZR Resources. CZR Resources and Zanthus are discussed through this MP as '**the Proponent**'. Further information on the Proponent information can be found in **Table 3.1.1**.

Authorisation for the Proponent to pursue approval and conduct activities on tenements associated with the Proposal are provided in Supplement A.

All activities associated with the Proposal, will occur within a Disturbance Envelope that incorporates the tenements listed in **Table 2.1.1**.

CZR Executive and Management have held Statutory Positions at operating mine sites throughout Western Australia and Australia. No CZR Director or Manager has previously been convicted, or paid a penalty, for an offence under a provision of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*

(**EPBC Act**) or the West Australian Environmental Act (**WA EP Act**), or similar environmental protection or health-related legislation in Western Australia or elsewhere in Australia. Furthermore, CZR Executive and Management have not had a licence or other authority suspended or revoked due to a breach of conditions or an offence under the EPBC Act or the (WA) EP Act or similar environmental protection or health-related legislation in Western Australia or elsewhere in Australia.

Table 2.1.1 : Tenement ID, Description and Ownership

ID	Area (ha)	Description	Ownership ZANTHUS	Ownership ZANF	Granted	Expiry
M08/533	581.2	Robe Mesa Mine	85%	15%	4/01/2023	3/01/2044
L08/295	606.2	Southern Haul Road	100%		2/06/2023	1/06/2044
L08/297	621.9	Infrastructure corridor	85%	15%	2/06/2023	1/06/2044
L08/303	827.8	Borefield	85%	15%	2/06/2023	1/06/2044
L08/319	12.4	Southern Haul Road	100%		29/08/2023	28/08/2044
L08/320	33.1	Southern Haul Road	100%		19/07/2023	18/07/2044
L08/321	84.2	Southern Haul Road	100%		8/08/2023	7/08/2044
L08/322	158.0	Southern Haul Road	100%		24/08/2023	23/08/2044
L08/323	28.3	Village	85%	15%	24/08/2023	23/08/2044
L08/326	22.1	Haul Road creek crossing	85%	15%	09/10/2023	08/10/2044

2.2 Robe Mesa History

E08/1060 and E08/1686 were granted to Zanthus Resources Pty Ltd on the 6 July 2009, then a wholly owned subsidiary of Creasy Group, who managed exploration until early 2011. During the latter part of 2011 and into 2012, the Yarraloola Project was reviewed and an 85% interest in the tenure was purchased by CZR through the acquisition of Zanthus. A 15% interest remains with Creasy Group and is held in ZanF, with CZR acting as Operator of the Tenements.

Zanthus and ZanF applied for Mining Lease Application 08/533 (M08/533) on 7 April 2021 over the area of the JORC compliant resources and reserves (Robe East Extension Iron Ore Deposit). M08/533 is a partial conversion of Exploration Licences 08/1060 and 08/1686 under section 67 of the Mining Act 1978 and was granted on the 4 January 2023. A Native Title Agreement with the Robe Rive Kuruma People was signed 21 December 2022.

3. Environment Group Site details

3.1 Environment Group Site details

Table 3.1.1 : Environmental Group Site Details		
EGS Name	Robe Mesa Iron Ore Project	
EGS Code	TBD	
Description of Operation	Above Water Table, open pit mining of Robe Mesa, utilising conventional drill and blast, truck, and shovel (excavator) open pit mining practises. The mesa edge buffer zone will be undisturbed. Mine waste will remain on top of the Mesa. No external waste dumps will be left upon closure, with the pit progressively backfilled with waste. The ROM pad will be off the mesa, feeding a dry processing plant (crush, screen, and stack) that produces 55.5% Fe fines only product. No wet processing will occur, and no tailings storage facility is required. Product will be stacked in a post-crusher stockyard with stockpiles built to product specification at the mine, prior to road-train haulage off site. The operation will produce up to 5 Mtpa of direct shipping ore (DSO) sinter fines (-8 mm) only product, for approximately 8-10 years. Non-Process Infrastructure that will support the Proposal includes infrastructure corridor (unsealed road), buildings, village accommodation, bore field, diesel power generation and communication tower.	
Phase of mining:	Greenfields project – new development moving from exploration into construction, commissioning and then operation. Mine not commenced	
Commodity mined	Iron Ore	
Estimated commencement date	Planned construction commencing Q2 2025 with first ore shipment in Q2 2026	
Estimated completion date	2035	
Tenement Details	Tenement	Tenement Holder
	M08/533	Zanthus Resources Pty Ltd and Zanf Pty Ltd
	L08/295	Zanthus Resources Pty Ltd
	L08/297	Zanthus Resources Pty Ltd and Zanf Pty Ltd
	L08/303	Zanthus Resources Pty Ltd and Zanf Pty Ltd
	L08/319	Zanthus Resources Pty Ltd
	L08/320	Zanthus Resources Pty Ltd
	L08/321	Zanthus Resources Pty Ltd
	L08/322	Zanthus Resources Pty Ltd
	L08/323	Zanthus Resources Pty Ltd and Zanf Pty Ltd
	L08/326	Zanthus Resources Pty Ltd and Zanf Pty Ltd
Company or Individual Name	CZR Resources Ltd	
ACN/ABN	91 112 866 869	
Address	Suite 9, Level 3, 47 Havelock Street, West Perth WA 6005	
Postal Address	PO Box 16, West Perth WA 6872	

Contact Person: Stefan Murphy, CZR Resources Managing Director
Stefan.Murphy@czrresources.com
Office: +61 8 9468 2050

4. Proposal Description

4.1 Background of the Proposal

4.1.1 History

Robe Mesa is the northern extension of RTIO's Mesa F deposit, together forming a connected Mesa Structure, approximately 10 km in strike length.

Zanthus and ZanF applied for Mining Lease Application 08/533 (M08/533) on 7 April 2021 over the area of the JORC compliant resources and reserves (Robe East Extension Iron Ore Deposit). M08/533 is a partial conversion of Exploration Licences 08/1060 and 08/1686 under section 67 of the Mining Act 1978 and was granted on the 4 January 2023. A Native Title Agreement with the Robe Rive Kuruma People was signed 21 December 2022.

A Pre-Feasibility Study (**PFS**) was completed in Nov 2020 and Definitive Feasibility Study (**DFS**) completed in October 2023.

Between 2021 and 2024, numerous biological, heritage surveys and exploration programs (including drilling of RC and eleven Diamond Core holes), a detailed gravity (geophysical) survey) and LiDAR survey of the haul road, infrastructure and mine area were conducted.

4.1.2 Resource Inventory

Exploration has been ongoing at Robe Mesa since 2014 with 389 drillholes testing the deposit up to a nominal 50 mE by 50 mN grid spacing representing 20 230 metres (**m**) of core drilled to date. This includes 11 diamond drill holes on Robe Mesa with an average depth of 60 m, that were drilled in 2022.

The Robe Mesa deposit has a Total Mineral Resource estimate of 45.2 **Mt** Fe 56% (**Table 4.1.1**) and updated Probable Reserve of 33.4 Mt at 55.0% Fe (**Table 4.1.2**), also showing Calcined iron (**CaFe %**) grades.

Table 4.1.1 : November 2022 Robe Mesa Ore Resource estimate

Fe cut-off	Category	Tonnes (Mt)	Fe (%)	SiO_2 (%)	Al_2O_3 (%)	LOI (%)	P (%)	S (%)	TiO_2 (%)	CaFe (%)
50	Indicated	71.8	54.4	7.49	3.27	10.75	0.039	0.018	0.121	61.0
	Inferred	17.8	54.3	7.56	3.28	10.80	0.042	0.017	0.131	60.8
	Total	**89.6**	**54.4**	**7.50**	**3.27**	**10.76**	**0.040**	**0.018**	**0.123**	**61.0**
55	Indicated	36.0	56.0	5.86	2.81	10.64	0.041	0.018	0.097	62.7
	Inferred	9.2	56.1	5.62	2.73	10.79	0.042	0.017	0.097	62.9
	Total	**45.2**	**56.0**	**5.81**	**2.79**	**10.67**	**0.041**	**0.018**	**0.097**	**62.7**

Snowdon Optiro prepared Probable Reserve using the Guidelines of the JORC Code (2012 Edition). **Table 4.1.2**.

Table 4.1.2 : October 2023 Robe Mesa Ore Reserve estimate

JORC (2012) Reserve category	Tonnes (Mt)	Fe (%)	SiO_2 (%)	Al_2O_3 (%)	LOI (%)	P (%)	S (%)	TiO_2 (%)	CaFe (%)
Probable	33.4	55.0	6.92	3.02	10.7	0.038	0.019	0.10	61.6

The mineralisation style at Robe Mesa is classified as a Channel Iron Deposit (**CID**). The drilling identified two mineralised CID horizons of flat-lying pisolitic iron-stone sediments that are each up to 25 m thick and separated by up to 20 m of shaly material. These CID horizons have been identified by the presence of greater than 50% iron (Fe) grades. Within each of these CID horizons the drill sampling suggests there are coherent regions of higher and lower grade mineralisation

4.1.3 Previously Approved Activities

There are no current mining approvals associated with the project and there are no existing facilities at the site. Rehabilitation of all previous drill sites is yet to be undertaken by CZR.

4.1.3.1 Mining Act 1978

The Mining Act 1978 requires that a Programme of Work (**PoW**) is lodged in the prescribed manner and approved by the Minister prior to an explorer or prospector conducting any ground disturbing activities with mechanised equipment. **Table 4.1.3** lists Robe Mesa POW's

Table 4.1.3 : Robe Mesa POW's

Reg ID	Tenement ID	Date Lodged	Approval Date	Expiry Date	Native Veg Clearing Permit (Required)	Drill Type	Collars	Pads		Sumps		Costean	Track		Comments
		[Date]	[Date]	[Date]	Y/N	RC, DDH, Mud Rotary	No.	No.	Size (m)	No.	Size (LxWxD)	Y/N	Y/N	L x W (m)	Notes / DPLH Ref No./ DBCA Correspondenc
LOOLA PROJECT															
96588	E08/1060	23/04/2021	17/06/2021	15/04/2025	No	RC	93	93	20 x 20	-	-	No	Yes	4639 x 3.5	Robe Mesa Deposit - RC infill (Heritage buffer zones excluded)
	E08/1686	23/04/2021	17/06/2021	15/04/2025	No	RC	7	7	20 x 20	-	-	No	Yes	361 x 3.5	
98423	E08/1060	14/07/2021	26/08/2021	30/06/2025	No	RC	32	32	20 x 20	-	-	No	Yes	1732 x 3.5	Robe Mesa Deposit - RC Northern Extension
	E08/1686	14/07/2021	26/08/2021	30/06/2025	No	RC	43	43	20 x 20	-	-	No	Yes	2268 x 3.5	
98426	E08/1686	13/07/2021	28/07/2021	30/06/2025	No	-	-	-	-	-	-	No	No	-	Robe Mesa Exploration Camp - East Location
98592	E08/1686	19/07/2021	28/07/2021	30/06/2025	No	-	-	-	-	-	-	No	No	-	Robe Mesa Exploration Camp - West Location
99580	E08/1060	14/07/2021	1/11/2021	30/10/2025	No	RC	93	93	20 x 20	-	-	No	Yes	4639 x 3.5	Robe Mesa Deposit - more RC drill pads for infill (Heritage buffer zones excluded)
	E08/1686	14/07/2021	1/11/2021	30/10/2025	No	RC	7	7	20 x 20	-	-	No	Yes	361 x 3.5	
101220	E08/1060	11/11/2021	Pending	Pending	No	DDH	37	-	-	74	2 x 1 x 1	No	No	-	Robe Mesa Deposit - DDH drilling and sumps on existing pads
	E08/1686	11/11/2021	Pending	Pending	No	DDH	3			6	2 x 1 x 1	No	No		
101254	E08/1686	13/11/2021	5/01/2022	4/01/2026	No	RC	50	50	20 x 20	-		No	Yes	2500 x 3.5	Robe East Extension Deposit - RC infill
101255	E08/1686	13/11/2021	Pending	Pending	No	DDH	25	-	-	50	2 x 2 x 1	No	No	-	Robe East Extension Deposit - DDH drilling and sumps on existing pads
101663	E08/1060	3/12/2021	Pending	Pending	Pending	Ramp	-	-	-	-	-	No	Yes	269 x 10	Cut and fill ramp (1:10 decline) on east side of Robe Mesa. Width = 8m with a 1m buffer on both sides
101689	E08/1686	17/12/2021	Pending	Pending	Pending	RC	30	30	20 x 20	-	-	No	Yes	2000 x 3.5	Robe North East RC Extension
101690	E08/1060	17/12/2021	Pending	Pending	Pending	RC/Rotary Mud	3	3	40 x 40	6	4 x 2 x 2	No	Yes	-	RC pilot holes, followed up by Rotary Mud construction of bore under 26D IWR
	E08/1686	17/12/2021	Pending	Pending	Pending	RC/Rotary Mud	11	11	40 x 40	22	4 x 2 x 2	No	No	6000 x 3.5	
102965	E08/1060														Starter Ramp
111014	E08/1686 E08/1060					n/a									Pitfalls for Enviro Survey
111121	E08/1686 E08/1060					RC/Rotary Mud									Crown Reserve Water Targets
111354	E08/3180					RC/Rotary Mud									Borefields on e08/3180
111719	E08/1686 E08/1060					n/a									Pitfalls for Enviro Survey. Was to replace 111014, but is now to be deleted.
111949	E08/1686	16/06/2022	1/08/2022	1/06/2026	No	RC/Rotary Mud	12	12	40x40	24	4x4x4	N	N		Water exploration, near gas pipeline.
111950	E08/1686 E08/1060	15/06/2022	1/07/2022	8/05/2026		n/a									Final Submission for Pitfall Survey. This will ultimatly replace 111014
113422	E08/1686	17/08/2022				RC/Rotary Mud	12	12	40x40	24	4x4x4	N	Y		Water exploration, near gas pipeline. Replacing 111949.
115462	E08/1686	10/01/2023	10/01/2023	9/01/2027	N	RC	20	20	20x15	20	4x4x2	N	N		Infill drilling on recently granted M08 518 lease.
115820	M08/519	10/01/2023	10/01/2023	9/01/2027	N	Excavation	0	0	0	0	0				Proposed borrow pit on E08/1686. Excess Tonnes Application lodged 17/01/2023
123031	E08/3399,3180,2137,1686	13/02/2024	13/02/2024	12/02/2024		-	-	-	-	-	-				Exploration access track from the NW Coastal Highway to the Robe Mesa Deposit.
123511	E08/2137	6/03/2024	6/03/2024	5/03/2028	N	n/a	0	0	0	0	0	0	0	0	Borrow pit proposal for E08/2137 to provide borrow material to remedy exploration track damage.

Future POW's will include:

- Borrow material investigations
- Track and drill pad construction for water exploration
- Pushing in access road to village location

4.1.3.2 Rights in Water and Irrigation Act 1914

CZR acquired bore PB13-3 from API in April 2023. PB13 will supply the 17 L/s Robe Mesa project water demand. Following the grant of L08-303, on 2 June 2023 an application to Department of Water and Environment Regulation (**DWER)** for the transfer of the API Groundwater Licence (**GWL**) to CZR and request to increase the water allocation limit to 540 ML/a was made (Reference 056535) and included submission of H2 Water Assessment, which was completed by AQ2.

Production bore PB13-3 is located within tenement L08/303, approximately 8 km southeast of Robe Mesa. The bore was drilled in December 2010 as part of the water supply network for the construction of a railway for Australian Premium Iron's (API) West Pilbara Iron Ore Project however the railway was never built. In December 2022 extended 7-day pump testing conducted by Matrix Hydro confirmed PB13 could supply all the Robe Mesa water demand. At PB13-3, groundwater is fresh, with salinity of 540 mg/L total dissolved solids (TDS) and is slightly alkaline (pH of 7.9). The water quality is good and is of potable quality.

DWER Water Online portal shows the following 26D licences for Robe Mesa (**Figure 4.1.1**)

Figure 4.1.1 : DWER Water Online portal

Instrument Number	Type	Water Management Area	Issued Date	Expiry Date	Status
207770	Construct or Alter Well	Pilbara	02/09/2022	01/09/2024	In Force
207771	Construct or Alter Well	Pilbara	02/09/2022	01/09/2024	In Force
207772	Construct or Alter Well	Pilbara	02/09/2022	01/09/2024	In Force
207170	Construct or Alter Well	Pilbara	28/03/2022	27/03/2024	In Force

4.2 Robe Mesa Proposal

As part of an overarching business and operational strategy, the Proponent is looking to unlock stranded iron ore assets within the West Pilbara region and work collaborative with other explorers, mining operators and service providers to develop export pathways. Robe Mesa is part of the Yarraloola precinct, which also has other iron ore and magnetite targets. The surrounding area also contains other potential new mine operations, which could provide longer term opportunities for other smaller sized companies that have lacked the infrastructure pathways to export.

The Purpose of the Proposal is to seek approval for the development of an AWT open pit mine operation, up to 5 Mtpa, with dry processing plant and associated infrastructure, including a 37km unsealed access road from the Robe Mesa site to the North West Coastal Highway.

4.2.1 Description

The Robe Mesa deposit is outcropping at surface and has a low strip ratio utilising conventional drill and blast, truck, and shovel (excavator) open pit mining practises. Mining activities will commence at the northern section and progressively advance south, operating both day and night shift for most of each year. The deposits strike length is 1 750 m, which is truncated to the south by the tenement boundary. The open pit is ~1 200 m strike length, with widths of ~450 m to 610 m (measured perpendicularly between opposing walls, with depth varying to ~45 m to 60 m deep. Excavation will be terminated at the nominated grade or at the water table. The planned minimum floor elevation is notionally 87.5mRL.

The mesa edge buffer zone is undisturbed, with a minimum 50 m edge that extends to several hundreds of metres in places. The initial two-three years of mining will be by single excavator and several haul trucks, with a second excavator and extra haulage fleet introduced as pit depth and southern zones are exposed.

Mine waste will remain on top of the Mesa. No external waste dumps will be left upon closure, with the pit progressively backfilled with waste. Waste generated in the early life of the pit will be re-handled. Waste Characterisation performed by Graeme Campbell Associates, indicate inert waste material with no fibrous or potentially acid forming material present.

All mining is Above Water Table, with no pit dewatering required.

Geotechnical investigations and design by Peter O'Bryan Associates, indicated drill and blast will be required through the ore and waste zone, and the base case wall design parameters include;

- Face height 8 m from surface to uppermost berm, 16 m from nominal,
- Face angle of 65° surface to 8 m, then 70° below 8 m depth,
- Berth width 6 m at 8 m depth, moving to 9 m at 16 m vertical intervals below 8 m depth.

Excavatability of Robe Mesa is estimated to range from hard digging to blasting required. George Boucher Blasting Consultancy has indicated Drill and Blast design criteria based on Very Low to Low strength rock with unconfined compressive strength (**UCS**) of 4Mpa to 50Mpa, with 4 m and 8 m bench heights, using a low powder factor (compared to industry benchmarks). Drill and blast practices will be modified near the pit edge if rock shelters are identified along the mesa escarpment. If any rock shelter found sits within the minimum distance for 95% probability of compliance with 20 mm/sec vibration, no blasting will occur, with only dozer rip and excavator free-dig activities performed (as noted in CZRs Environmental Management Plan).

Topsoil stripped from the pit area will be stored in stockpiles with a maximum height of 2 m, and subsoil stored in stockpiles with a maximum height of 4 m. Topsoil will be stripped from the disturbance areas and stockpiled until used for progressive rehabilitation during operations or at closure.

Mined ore will be hauled off the mesa via a ramp to a run of mine (**ROM**) pad and paddock dumped into ROM fingers. A front-end loader (**FEL**) will feed the dry processing plant (primary crushed, secondary, and possibly tertiary crushed, screened, sampled and then stacked) to produce a 55.5% Fe fines only product. No wet processing will occur, and no tailings storage facility is required. Product will be stacked in a post-crusher stockyard with stockpiles built to product specification at the mine, prior to being loaded by FEL into road-trains for haulage off site.

The operation will produce up to 5 Mtpa of direct shipping ore (DSO) sinter fines (-10mm) only product, for approximately 8-10 years however the plant will have a 5 Mtpa capacity allowing flexibility for market demand.

Non-Process Infrastructure (**NPI**) that will support the Proposal includes infrastructure corridor (road), office buildings, workshops, 120-person village accommodation, sewerage treatment facilities, bore field, diesel power generation solutions and communication tower.

Power for both the processing and non-processing infrastructure will be via diesel genset locally positioned with bulk fuel storage tanks close to infrastructure at the Mine Administration, Processing Plant, and Village.

Workforce to support the Proposal will be sourced where possible from surrounding areas of Onslow, Karratha, and other regional areas, with priority opportunities given to Robe River Kuruma People. Due to current labour shortages, a 'Fly-in Fly-out' (**FIFO**) option will be used for workforce personal commuting from major cities. A 5-day per week transit bus will operate between the Robe Mesa Village, and Karratha Airport (or Onslow Airport, if flight frequencies increase in the future). Additional to the infrastructure near Robe Mesa, NPI is proposed to facilitate early construction of the access road and village (production bores, exploration camp, office buildings), with early work construction workforce of up to 60 people. This mobile camp includes a dry mess, office space, water tanks, water treatment plant, laundry and first aid facilities. Upon completion of the Robe Mesa Village, the exploration camp will be demobilised, and workforce housed in the Village as required for construction, operational and maintenance demands.

4.3 Proposal Summary

Table 4.3.1 : Proposal Summary

Element	Description
General	
Proposal Commencement	Construction 2025, mining 2026
Processing Rate	Up to 5 Mtpa
Power Generation	Localised diesel genset, with total installed capacity of 5 megawatt (**MW)**
Mining Activities	
Mining Method	Conventional open pit, above water table mining

Table 4.3.1 : Proposal Summary	
Element	**Description**
Depth of Excavation	60 m below ground level (**bgl**)
Total amount of Ore Reserve	33.4 Mt at 55.0% Fe (61.6% calcined Fe million tonnes)
Total Waste Rock	19.3 Mt
Total Tailings	Nil. No dry or wet tailings generated as part of operation
Depth to Water Table	Average depth 60 mbgl
Disturbance	
Proposed Disturbance Envelope (ha)	270 ha
Construction Activities	Approximately 12 months (pending wet season constraints)
Construction Commencement	Q2 2025
Workforce	
Construction Workforce	Average 104 people, maximum 205 people
Operational Workforce	292 excluding port operations, 358 including port operations
Current Operational Workforce	Nil

Waste will be progressively backfilled into the Pit Void please refer to the Sterilisation Report in Section 18.1

5. Activity Details

5.1 Summary of Key Mine Activities

As detailed in Section 1.1 Scope of the Proposal includes:

- Introduction of construction and operation of
  - Above Water Table **(AWT)**, open pit mining of Robe Mesa
  - Dry crush and screen processing plant for 5 **Mtpa**
  - Ancillary infrastructure
  - Fuel Storage facilities
  - Village
  - Landfill site
  - Fresh water dam
  - Transport and infrastructure corridors, drainage infrastructure and road construction activities
- Overall disturbance area of 270 hectares

Clearing will be undertaken for a variety of Key Mining Activities and Miscellaneous Mine Activities, as defined by DEMIRS, and outlined in **Table 5.1.1**.

Table 5.1.1 : Disturbance Summary Matrix

Activity Type	Hectare (ha)
Low Grade Ore Stockpile	8.6
Mining Void (with a depth of at least 5 metres above groundwater	68.0
Plant site	0.9
Run-of-mine pad	3.8
TOTAL KEY MINING ACTIVITIES	81.3
Topsoil stockpile	24.9
Borefield	1.3
Borrow pit or shallow surface excavation	8.8
Building	0.6
Communication Tower	2.1
Dam – fresh water	7.8
Fuel storage facility	0.2
Land that is cleared of vegetation and not otherwise described	7.7
Transport or service infrastructure corridor	107.4
Village (accommodation)	24.9
Workshop	1.4
Landfill Site	1.5
GRAND TOTAL	269.7

5.1.1 Tenement Activity Details Matrix

Table 5.1.1 provides a summary of Key Mine Activities and Other Activities for the proposal which are listed in more detail in subsequent sections. **Table 5.1.2** provides a summary of proposal Tenement Activity Detail Summary Matrix.

Table 5.1.2 : Tenement Activity Detail Summary Matrix										
Activity Type	**M08/533**	**L08/295**	**L08/297**	**L08/303**	**L08/319**	**L08/320**	**L08/321**	**L08/322**	**L08/323**	**L08/326**
Key Mine Activities										
Low Grade Ore Stockpile	8.6									
Mining Void (with a depth of at least 5 metres)	68.0									
Plant site	0.9									
Run-of-mine pad	3.8									
TOTAL KEY MINE ACTIVITIES AREA (Ha)	81.3	0	0	0	0	0	0	0	0	0
Other Activities										
Borefield		x	x	x		x			x	
Borrow pit or shallow surface excavation	x	x	x				x	x		
Buildings (other than workshop) or camp site	x									
Communication Tower	x									
Core Yard										
Dam – fresh water	x	x	x			x		x		
Diversion channel or drain	x									
Fuel storage facility	x									
Landfill Site			x							
Land that is cleared of vegetation (non-rehab)	x			x						
Laydown or hardstand area	x									
Sewage Pond										
Topsoil stockpile	x	x	x			x	x		x	
Transport or service infrastructure corridor	x	x	x	x	x	x	x	x	x	x
Village (accommodation)			x						x	
Workshop	x									
TOTAL OTHER ACTIVITY AREA (Ha)	33.7	64.1	20.4	10.2	1.0	7.1	8.1	15.2	27.2	1.5
TOTAL MINE ACTIVITY AREA (Ha)	**115**	**64.1**	**20.4**	**10.2**	**1.0**	**7.1**	**8.1**	**15.2**	**27.2**	**1.5**
TOTAL TENEMENT ACTIVITY AREA (Ha)	**270**									

5.2 Key Mining Activities Details by Tenement

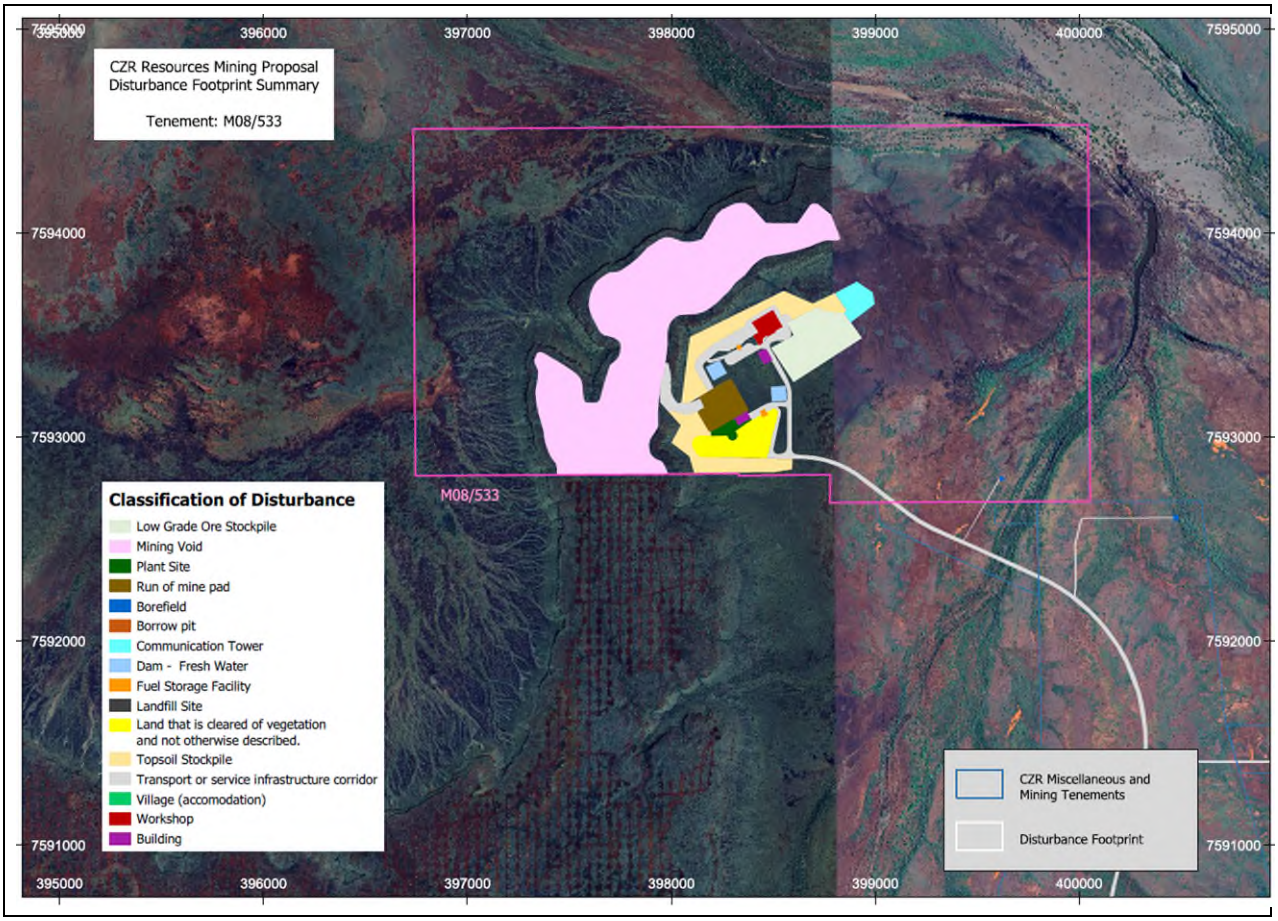
5.2.1 M08/533 Activity Details

Main mine site and mine operations centre infrastructure location (**Figure 5.2.1**).

Table 5.2.1 : Mine Activity Details by Tenement – M08/533

Activity Type	Mine Activity Reference	Proposed area (Ha)	Current Approved Area (Ha)	Total Area (Ha)
Key Mine Activities				
Low Grade Ore Stockpile	LG Stockpile	8.6	0	8.6
Mining Void (with a depth of at least 5 metres) – Above Ground-Water Level	Robe Mesa Pit	68.0	0	68.0
Plant site	Plant	0.9	0	0.9
Run-of-mine pad	ROM Pad	3.8	0	3.8
Total Key Mine Activities		81.3		81.3
Other Mine Activities				
Borefield				
Borrow pit or shallow surface excavation	x			
Buildings (other than workshop) or camp site	x			
Communication Tower	x			
Core Yard				
Dam – fresh water	x			
Diversion channel or drain	x			
Fuel storage facility	x			
Landfill Site				
Land that is cleared of vegetation	x			
Laydown or hardstand area	x			
Sewage Pond				
Topsoil stockpile	x			
Transport or service infrastructure corridor	x			
Village (accommodation)				
Workshop	x			
Total Other Mine Activity Area		33.7	0	33.7
TOTAL TENEMENT ACTIVITY AREA		115.0	0	115.0

Figure 5.2.1 : M08/533 Activity Details



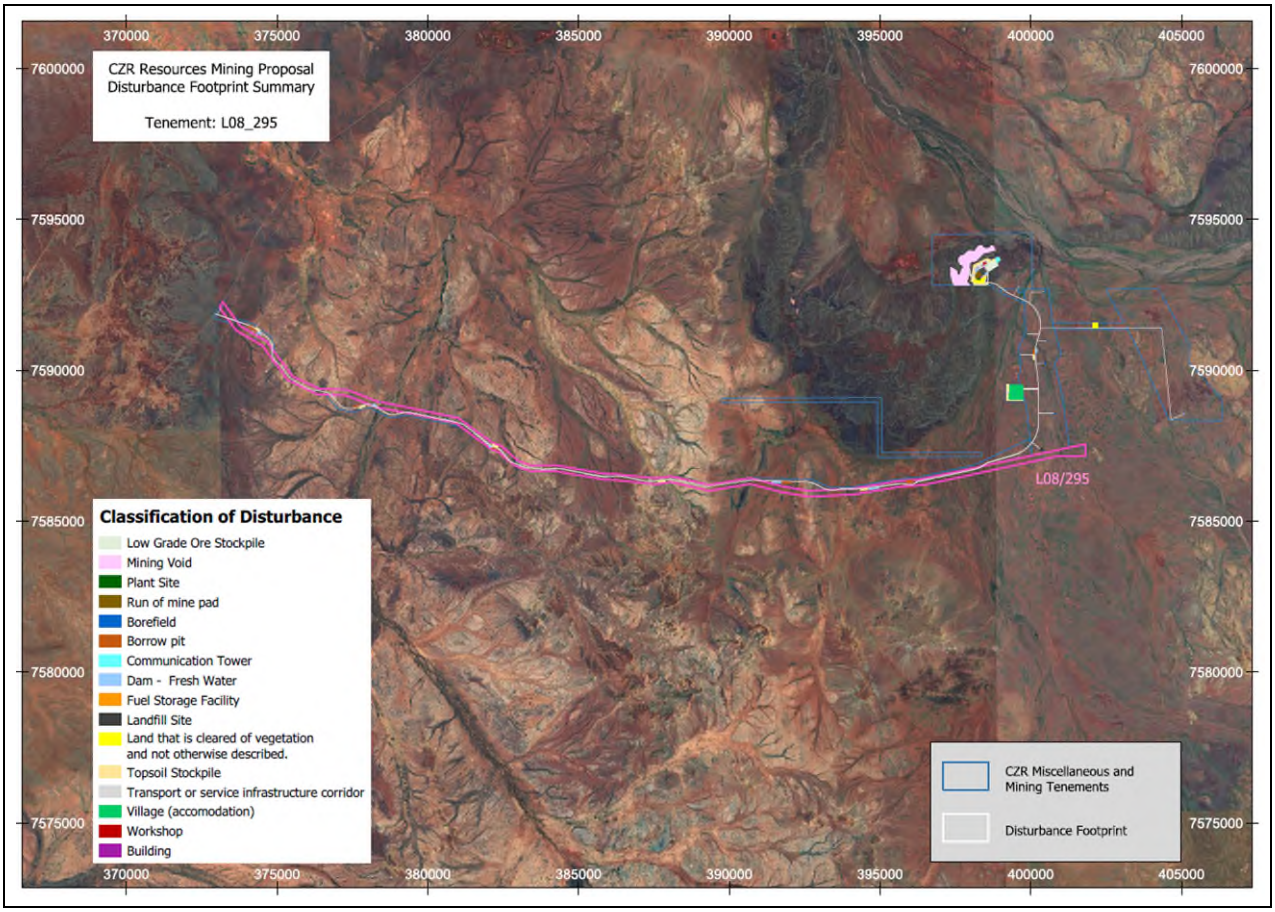
5.2.2 L08/295 Activity Details

Southern Haul route main tenement with temporary bore/s and turkey's nest for road construction purposes (**Figure 5.2.2**).

Table 5.2.2 : Mine Activity Details by Tenement – L08/2295

Activity Type	Mine Activity Reference	Proposed area (Ha)	Current Approved Area (Ha)	Total Area (Ha)
Key Mine Activities				
N/A		0	0	0
Other Mine Activities				
Borefield	x			
Borrow pit or shallow surface excavation	x			
Buildings (other than workshop) or camp site				
Communication Tower				
Core Yard				
Dam – fresh water	x			
Diversion channel or drain				
Fuel storage facility				
Landfill Site				
Land that is cleared of vegetation				
Laydown or hardstand area				
Sewage Pond				
Topsoil stockpile	x			
Transport or service infrastructure corridor	x			
Village (accommodation)				
Workshop				
Total Other Mine Activity Area		64. 1	0	64.1
TOTAL TENEMENT ACTIVITY AREA		64.1	0	64.1

Figure 5.2.2 : L08/295 Activity Details

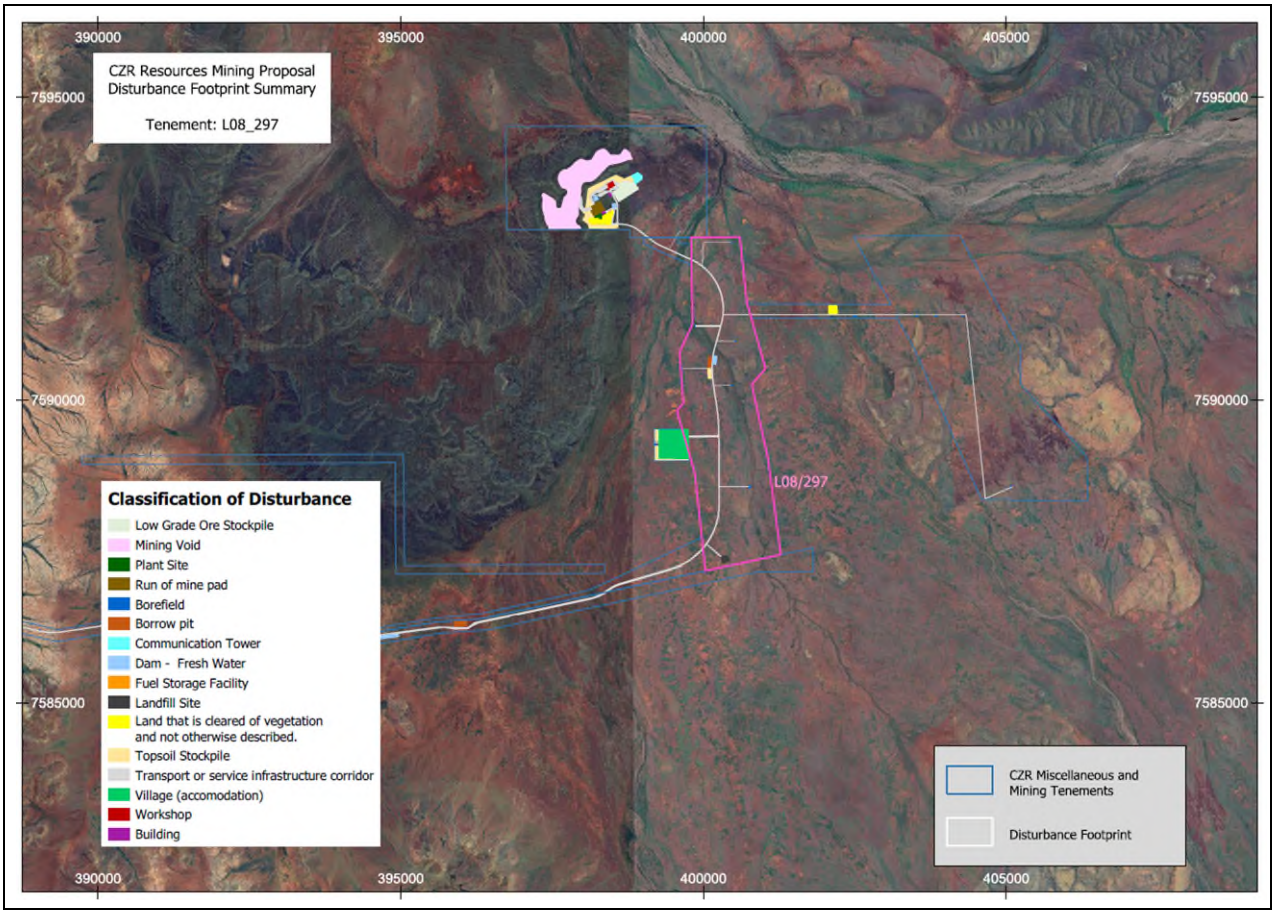


5.2.3 L08/297 Activity Details

Infrastructure corridor containing access road, bores, landfill, and part of village (**Figure 5.2.3**).

Table 5.2.3 : Mine Activity Details by Tenement – L08/297				
Activity Type	**Mine Activity Reference**	**Proposed area (Ha)**	**Current Approved Area (Ha)**	**Total Area (Ha)**
Key Mine Activities				
N/A		0	0	0
Other Mine Activities				
Borefield	x			
Borrow pit or shallow surface excavation	x			
Buildings (other than workshop) or camp site				
Communication Tower				
Core Yard				
Dam – fresh water	x			
Diversion channel or drain				
Fuel storage facility				
Landfill Site	x			
Land that is cleared of vegetation				
Laydown or hardstand area				
Sewage Pond				
Topsoil stockpile	x			
Transport or service infrastructure corridor	x			
Village (accommodation)	x			
Workshop				
Total Other Mine Activity Area		20.4	0	20.4
TOTAL TENEMENT ACTIVITY AREA		20.4	0	20.4

Figure 5.2.3 : L08/297 Activity Details

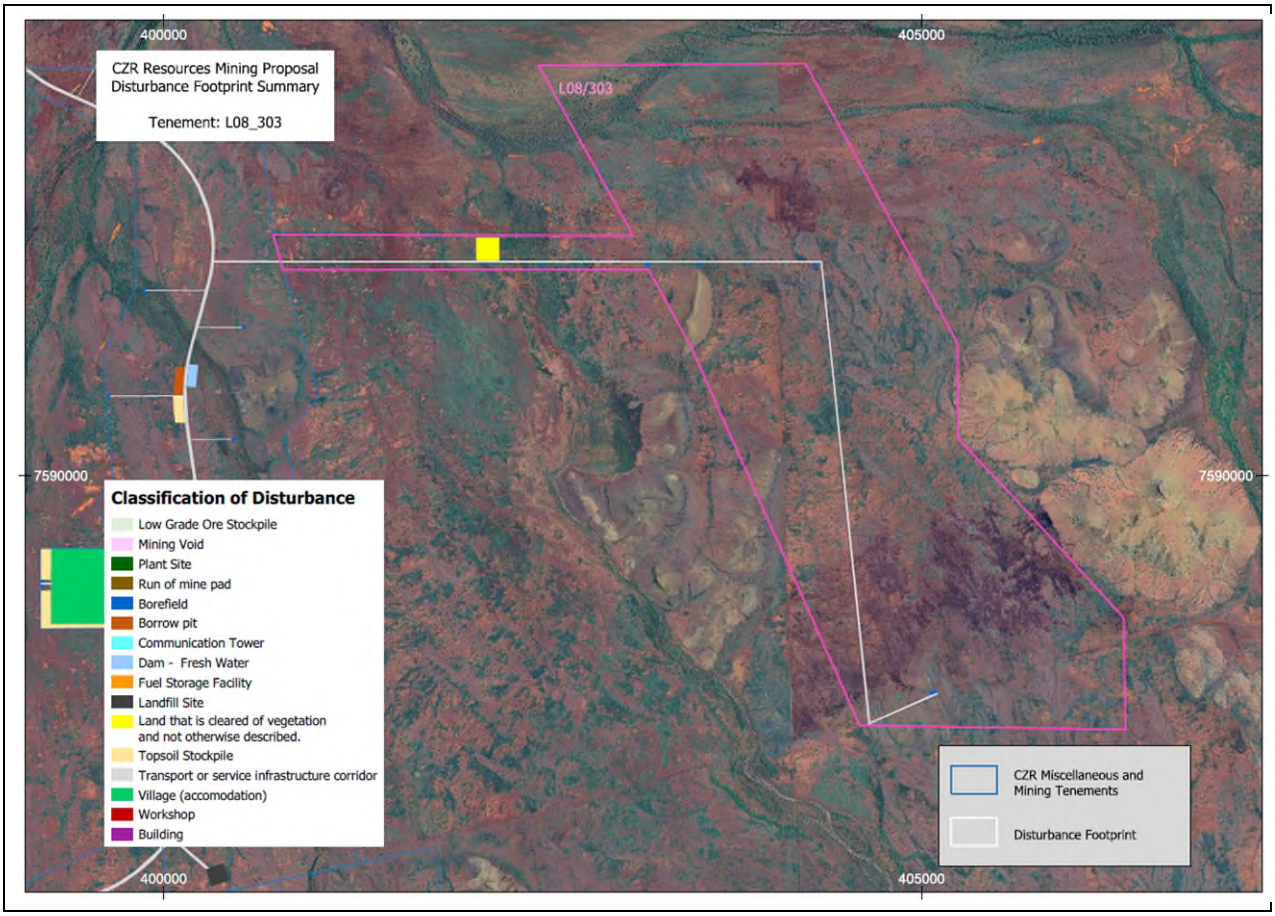


5.2.4 L08/303 Activity Details

Infrastructure corridor containing infrastructure (bores, pipeline, road, ANFO storage) (**Figure 5.2.4**).

Table 5.2.4 : Mine Activity Details by Tenement – L08/303				
Activity Type	**Mine Activity Reference**	**Proposed area (Ha)**	**Current Approved Area (Ha)**	**Total Area (Ha)**
Key Mine Activities				
N/A		0	0	0
Other Mine Activities				
Borefield	x			
Borrow pit or shallow surface excavation				
Buildings (other than workshop) or camp site				
Communication Tower				
Core Yard				
Dam – fresh water				
Diversion channel or drain				
Fuel storage facility				
Landfill Site				
Land that is cleared of vegetation	x			
Laydown or hardstand area				
Sewage Pond				
Topsoil stockpile				
Transport or service infrastructure corridor	x			
Village (accommodation)				
Workshop				
Total Other Mine Activity Area		10.2	0	10.2
TOTAL TENEMENT ACTIVITY AREA		10.2	0	10.2

Figure 5.2.4 : L08/303 Activity Details



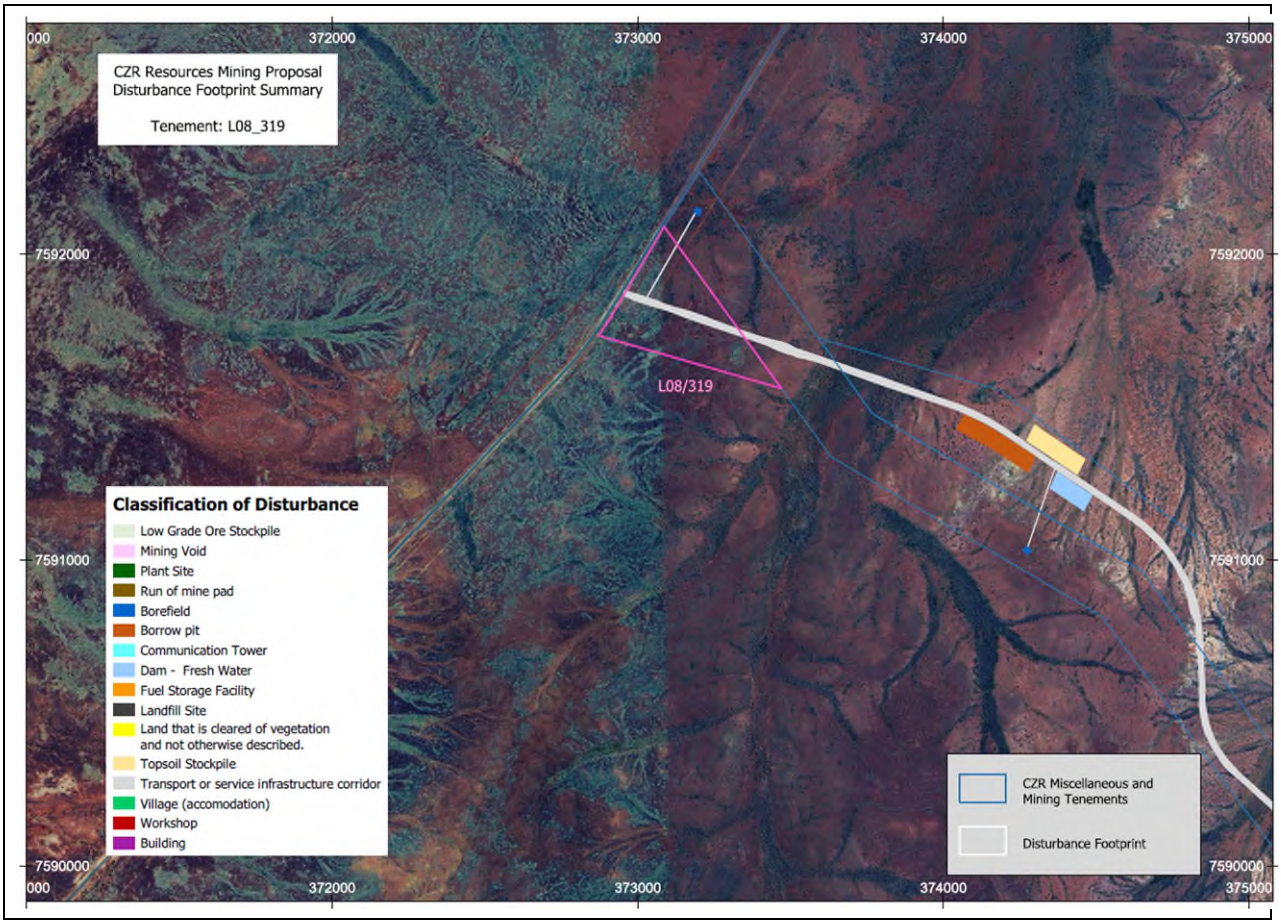
5.2.5 L08/319 Activity Details

North-West Coastal Highway intersection onto site access road, tenement required due to engineering modifications required on original road (L08-295) (**Figure 5.2.5**).

Table 5.2.5 : Mine Activity Details by Tenement – L08/319

Activity Type	Mine Activity Reference	Proposed area (Ha)	Current Approved Area (Ha)	Total Area (Ha)
Key Mine Activities				
N/A		0	0	0
Other Mine Activities				
Borefield				
Borrow pit or shallow surface excavation				
Buildings (other than workshop) or camp site				
Communication Tower				
Core Yard				
Dam – fresh water				
Diversion channel or drain				
Fuel storage facility				
Landfill Site				
Land that is cleared of vegetation				
Laydown or hardstand area				
Sewage Pond				
Topsoil stockpile				
Transport or service infrastructure corridor	x			
Village (accommodation)				
Workshop				
Total Other Mine Activity Area		1.0	0	1.0
TOTAL TENEMENT ACTIVITY AREA		1.0	0	1.0

Figure 5.2.5 : L08/319 Activity Details



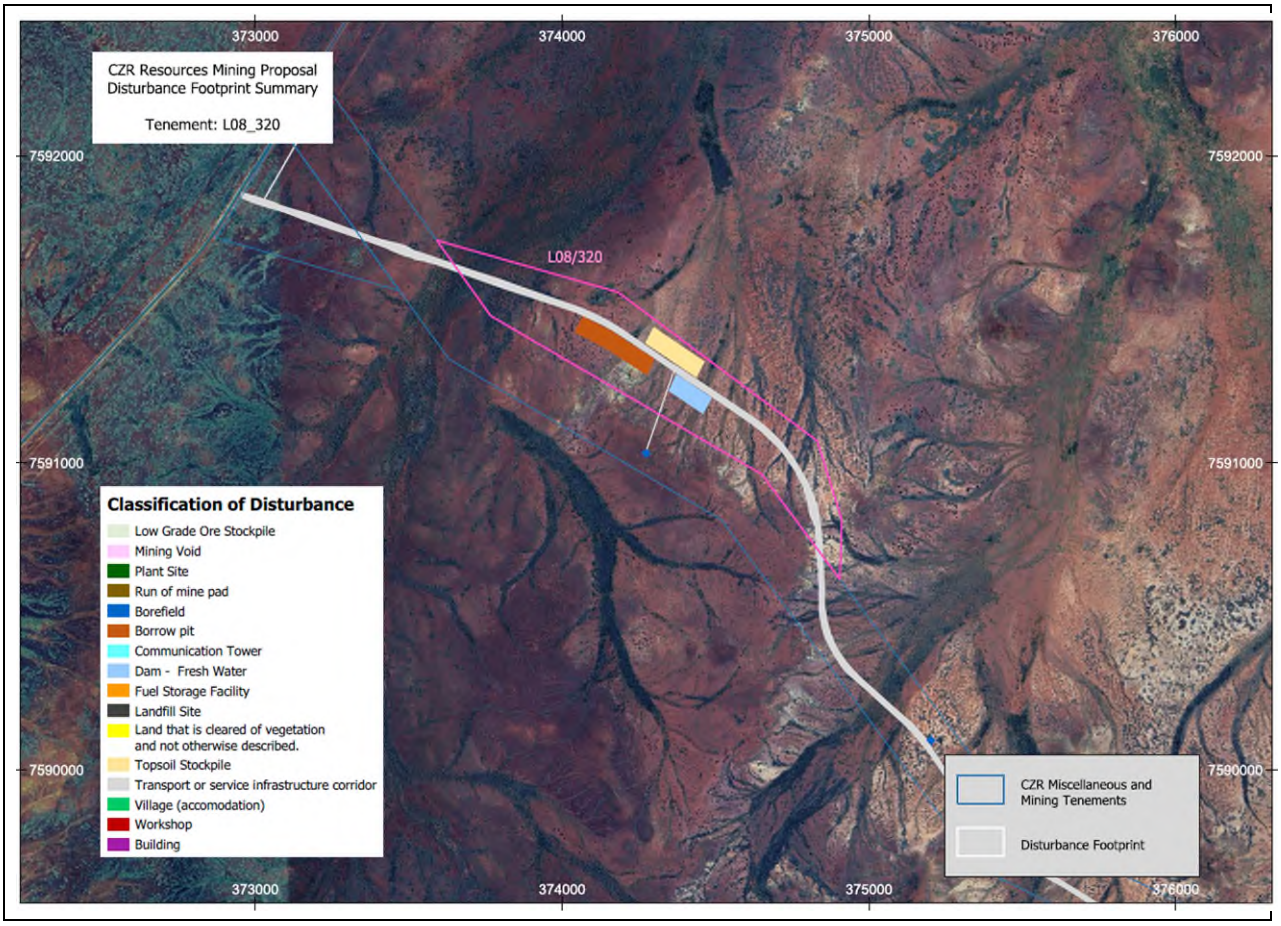
5.2.6 L08/320 Activity Details

Site access road, tenement required due to engineering modifications required on original road (L08-295) (**Figure 5.2.6**).

Table 5.2.6 : Mine Activity Details by Tenement – L08/320

Activity Type	Mine Activity Reference	Proposed area (Ha)	Current Approved Area (Ha)	Total Area (Ha)
Key Mine Activities				
N/A		0	0	0
Other Mine Activities				
Borefield	x			
Borrow pit or shallow surface excavation				
Buildings (other than workshop) or camp site				
Communication Tower				
Core Yard				
Dam – fresh water	x			
Diversion channel or drain				
Fuel storage facility				
Landfill Site				
Land that is cleared of vegetation				
Laydown or hardstand area				
Sewage Pond				
Topsoil stockpile	x			
Transport or service infrastructure corridor	x			
Village (accommodation)				
Workshop				
Total Other Mine Activity Area		7.1	0	7.1
TOTAL TENEMENT ACTIVITY AREA		7.1	0	7.1

Figure 5.2.6 : L08/320 Activity Details



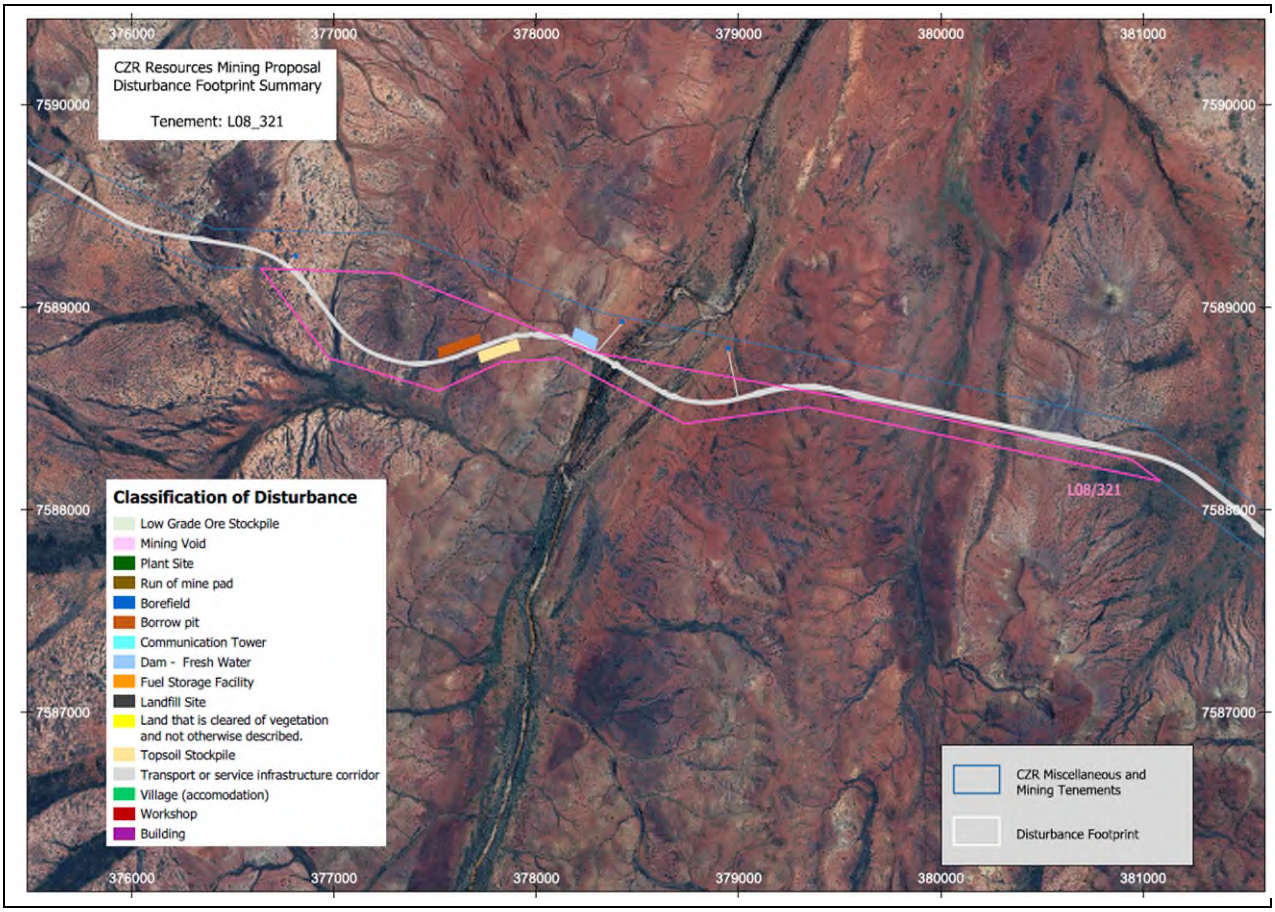
5.2.7 L08/321 Activity Details

Site access road, tenement required due to engineering modifications required on original road (L08-295) (**Figure 5.2.7**).

Table 5.2.7 : Mine Activity Details by Tenement – L08/321

Activity Type	Mine Activity Reference	Proposed area (Ha)	Current Approved Area (Ha)	Total Area (Ha)
Key Mine Activities				
N/A		0	0	0
Other Mine Activities				
Borefield				
Borrow pit or shallow surface excavation	x			
Buildings (other than workshop) or camp site				
Communication Tower				
Core Yard				
Dam – fresh water				
Diversion channel or drain				
Fuel storage facility				
Landfill Site				
Land that is cleared of vegetation				
Laydown or hardstand area				
Sewage Pond				
Topsoil stockpile	x			
Transport or service infrastructure corridor	x			
Village (accommodation)				
Workshop				
Total Other Mine Activity Area		8.1	0	8.1
TOTAL TENEMENT ACTIVITY AREA		8.1	0	8.1

Figure 5.2.7 : L08/321 Activity Details



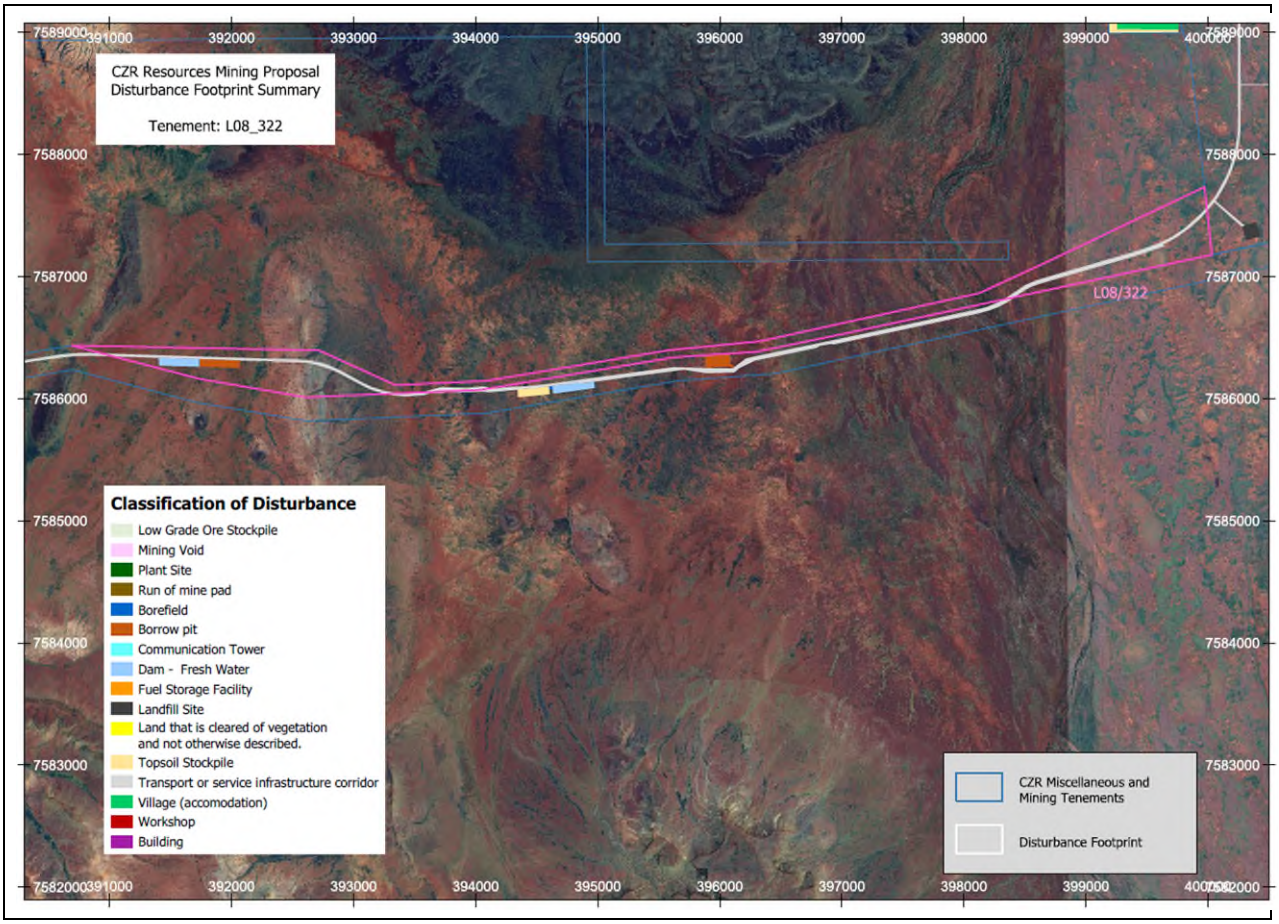
5.2.8 L08/322 Activity Details

Site access road, tenement required due to engineering modifications required on original road (L08-295) (Figure 5.2.8).

Table 5.2.8 : Mine Activity Details by Tenement – L08/322

Activity Type	Mine Activity Reference	Proposed area (Ha)	Current Approved Area (Ha)	Total Area (Ha)
Key Mine Activities				
N/A		0	0	0
Other Mine Activities				
Borefield				
Borrow pit or shallow surface excavation	x			
Buildings (other than workshop) or camp site				
Communication Tower				
Core Yard				
Dam – fresh water	x			
Diversion channel or drain				
Fuel storage facility				
Landfill Site				
Land that is cleared of vegetation				
Laydown or hardstand area				
Sewage Pond				
Topsoil stockpile				
Transport or service infrastructure corridor	x			
Village (accommodation)				
Workshop				
Total Other Mine Activity Area		15.2	0	15.2
TOTAL TENEMENT ACTIVITY AREA		15.2	0	15.2

Figure 5.2.8 : L08/322 Activity Details



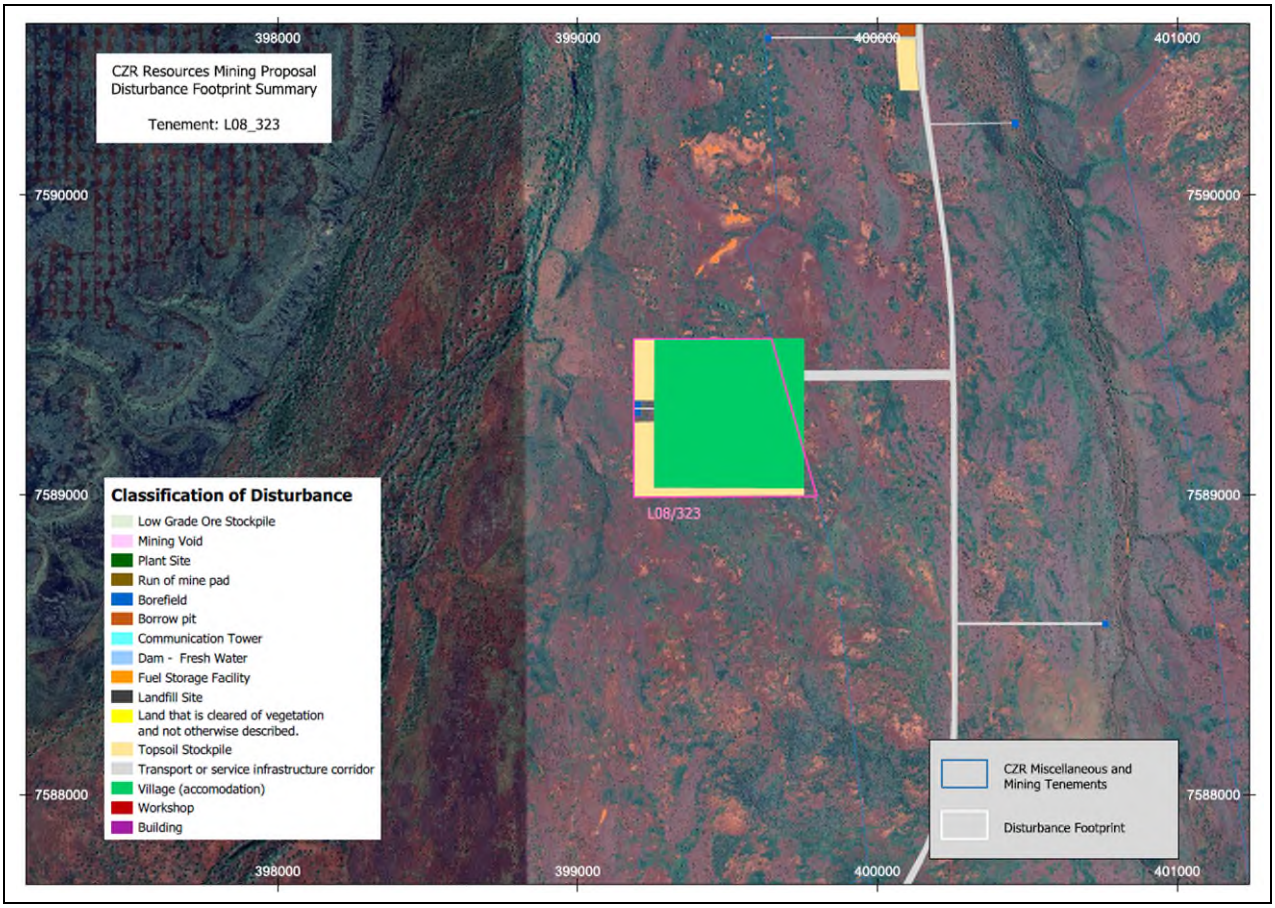
5.2.9 L08/323 Activity Details

Adjustment of earlier Village position due to flood modelling and positioning camp on higher ground (Figure 5.2.9).

Table 5.2.9 : Mine Activity Details by Tenement – L08/323

Activity Type	Mine Activity Reference	Proposed area (Ha)	Current Approved Area (Ha)	Total Area (Ha)
Key Mine Activities				
N/A		0	0	0
Other Mine Activities				
Borefield	x			
Borrow pit or shallow surface excavation				
Buildings (other than workshop) or camp site				
Communication Tower				
Core Yard				
Dam – fresh water				
Diversion channel or drain				
Fuel storage facility				
Landfill Site				
Land that is cleared of vegetation				
Laydown or hardstand area				
Sewage Pond				
Topsoil stockpile	x			
Transport or service infrastructure corridor	x			
Village (accommodation)	Robe Mesa Village			
Workshop				
Total Other Mine Activity Area		27.2	0	27.2
TOTAL TENEMENT ACTIVITY AREA		27.2	0	27.2

Figure 5.2.9 : L08/323 Activity Details



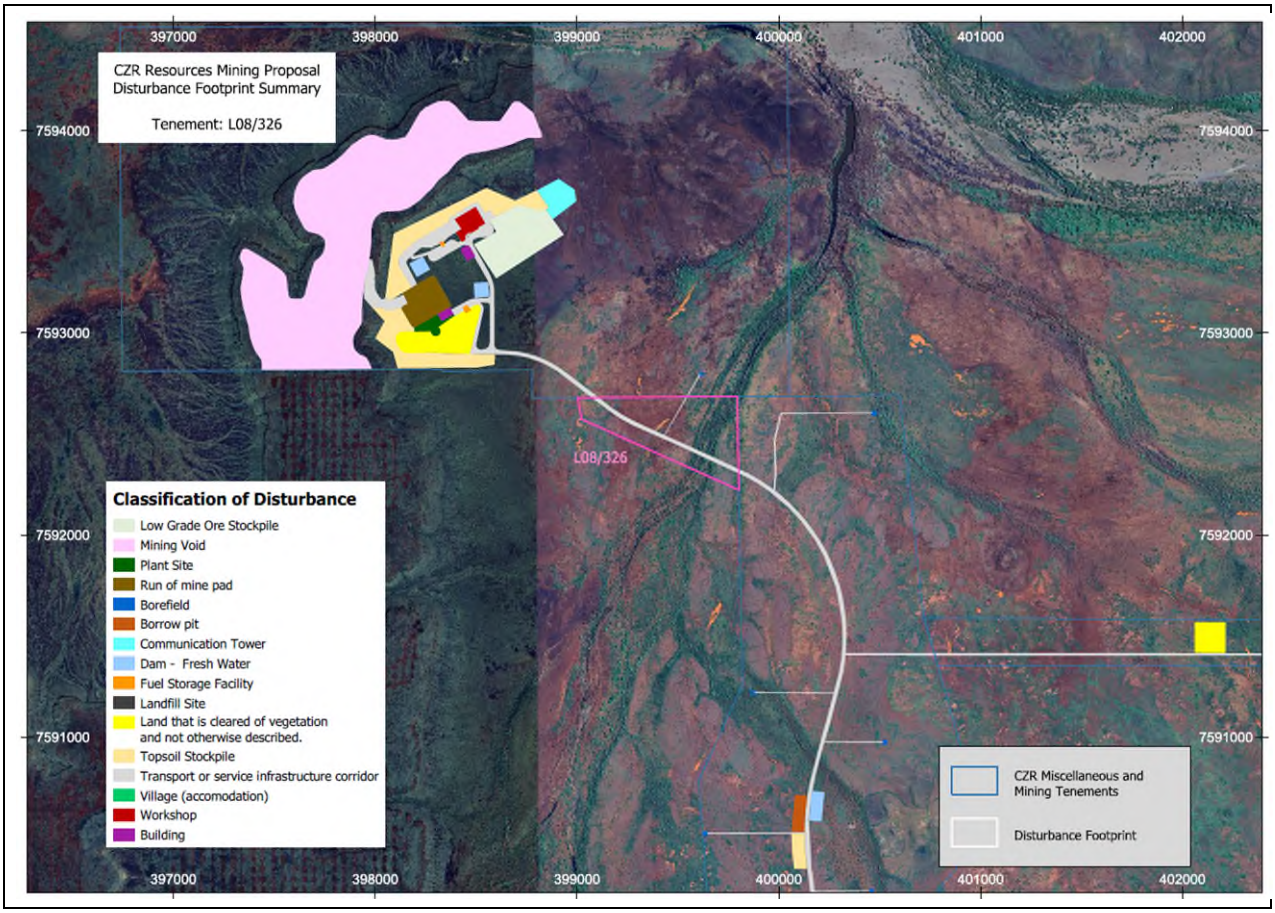
5.2.10 L08/326 Activity Details

Site access road, tenement required due to cultural heritage survey requesting road modification (Figure 5.2.10).

Table 5.2.10 : Mine Activity Details by Tenement – L08/326

Activity Type	Mine Activity Reference	Proposed area (Ha)	Current Approved Area (Ha)	Total Area (Ha)
Key Mine Activities				
N/A		0	0	0
Other Mine Activities				
Borefield				
Borrow pit or shallow surface excavation				
Buildings (other than workshop) or camp site				
Communication Tower				
Core Yard				
Dam – fresh water				
Diversion channel or drain				
Fuel storage facility				
Landfill Site				
Land that is cleared of vegetation				
Laydown or hardstand area				
Sewage Pond				
Topsoil stockpile				
Transport or service infrastructure corridor	x			
Village (accommodation)				
Workshop				
Total Other Mine Activity Area		1.5	0	1.5
TOTAL TENEMENT ACTIVITY AREA		1.5	0	1.5

Figure 5.2.10 : L08/326 Activity Details



5.2.11 All tenements Activity Details

Table 5.2.11 : Mine Activity Details by Tenement

Tenement – Total Tenement Activity Area	Proposed area (Ha)	Current Approved Area (Ha)	Total Area (Ha)
M08_533	115.0	0	115.0
L08_295	64.1	0	64.1
L08_297	20.4	0	20.4
L08_303	10.2	0	10.2
L08_319	1.0	0	1.0
L08_320	7.1	0	7.1
L08_321	8.1	0	8.1
L08_322	15.2	0	15.2
TOTAL TENEMENT ACTIVITY AREA	269.7	0	269.7

Please refer to **Figure 5.6.1** (Site Plan) for overall view of tenement disturbance and Activities.

5.3 Additional detail of Key Mine Activities

5.3.1 Mining Void – Robe Mesa Mine Pit

The Robe Mesa mine pit will be above water table and progressively backfilled with waste material. As mining will only occur above the groundwater table, no dewatering is required.

Progressive mining and backfilling of waste will result in no waste rock landforms outside the mine pit footprint. Progressive mining will generally occur from the north to south, using conventional open pit mining methods, within the elevated mesa surface.

A mesa edge buffer zone will ensure that the mine pit is setback a minimum of 50m (and up to 250-300m in places) to protect valuable mesa edge habitat.

A detailed description of the Robe Mesa mining void is provided in **Table 5.3.1**.

Table 5.3.1 : Key Mine Activity – Robe Mesa Mine Pit	
Activity Type: Mining Void (depth greater than 5m – above groundwater)	
Mine Activity Reference	Robe Mesa Mine Pit
Total Area (ha)	68 ha
Area per tenement (ha)	M08/533 = 68 ha
Design description	*Volume* The volume of ore within the Robe Mesa mine pit is 33.4 Mt@ 55%Fe, with a 0.6 waste to ore strip ratio. The total volume of waste material expected to be produced is 19.3 Mt *Pit Dimensions* The open pit consists of a ~1 200m strike length, a width that ranges between ~450m and 610m, and a void that is no deeper than 60m. Excavation will be terminated at the nominated grade or at the water table. The planned minimum floor elevation is notionally 87.5mRL. The mining nodes across the southern, central and northern sectors of the Robe Mesa mine void are presented in **Figure 5.3.1** and as cross sections in **Figure 5.3.2**. *Pit Wall Description* Berm design will depend on batter height. • 4m high batters will have 3m berms; • 8m high will have 6m berms; • 12m high will have 8m berms. Bench height will range between 4 and 8m. **Figure 5.3.3** shows Landform plan view, **Figure 5.3.4** to **Figure 5.3.6** present pit shell cross sections (and final landforms), showing bench height details. *Backfill and Post Mining Landform* Waste material will be returned to the mine pit void. **Figure 5.3.3** shows the proposed post mining landform of the Robe Mesa mine void, inclusive of natural surface, cut ramp, exposed pit walls and final fill surface.

Table 5.3.1 : Key Mine Activity – Robe Mesa Mine Pit			
Activity Type: Mining Void (depth greater than 5m – above groundwater)			
	This plan view references three cross sections in **Figure 5.3.4**, **Figure 5.3.5** and **Figure 5.3.6**. **Figure 5.3.7** and **Figure 5.3.8** present the final fill surface at Robe Mesa, which occurs as fill material above the pre-mining surface (complete fill) and fill material which is below the pre-mining surface (partial fill). Image contains elevation points for reference. There are two areas of the mine void where final fill surface extends higher than the pre-mining natural surface (pink polygon in **Figure 5.3.7**). The highest point of the waste fill in the northern section is 166m RL, against a proximal contour height of 149.9m RL. In the central part of the pit there is a waste surface at 144m RL against a proximal contour surface at 140m RL. It is important to note that waste dumps above the natural surface, have been designed so that the toe-out point meets the pit wall to ensure that there is minimised risk of erosion and run-off of the waste dump onto the natural contour surface. Section B-B' in **Figure 5.3.5** illustrates this feature. There are also two areas of the pit void where backfill will not occur to the full extent, with the final surface defined by pit-walls and fill material occurring below the pre mining contour level (blue polygon in **Figure 5.3.7**). In the central part of the pit there is a partial fill area where the fill level is 128m RL against a proximal contour surface of 149m RL. In the south of the pit, there is a partial fill area where the fill level is 96.21m RL against a proximal contour surface of 140m RL. *Abandonment Bunds:* Due to the steep terrain of the Mesa Landform, the post-mining surface is mostly constrained by contour. As a result of this, there is only two abandonment bunds required to completely restrict access to post-mining pit voids. This includes a 650m long bund directly to the south of the Robe Mesa pit to restrict access from the neighbouring Mesa F (Rio Tinto), and a 150m long bund at the crest of the Robe Mesa Ramp. Bunds have been designed with a 2m height and 3m width of base which is considered sufficient to restrict access. The two abandonment bund locations and cross sections are presented in **Figure 5.3.8** with cross sections shown in **Figure 5.3.9** and **Figure 5.3.10**. *Topsoil stockpiles:* Designated topsoil stockpile areas are allocated proximal to the areas of disturbance and support storage of all salvageable materials (see Section 8.3.1 for further topsoil and subsoil information).		
Material Characteristics	Fibrous minerals	Yes ☐ No ☒	No fibrous material identified
	Radioactive material	Yes ☐ No ☒	No radioactive material
	Materials capable of generating acid and metalliferous drainage, including neutral drainage and saline drainage	Yes ☐ No ☒	All samples classify as Non-Acid Forming (NAF), due to 'negligible-sulphides' (Total-S< 0.1 %) in a groundmass devoid of carbonates]. Refer to **section 8.3.2** for more details. Refer to GCA 2022 (Section 1.1. in **Appendix 8-01**)

Table 5.3.1 : Key Mine Activity – Robe Mesa Mine Pit			
Activity Type: Mining Void (depth greater than 5m – above groundwater)			
	Dispersive and/or erosive material that is capable of compromising the structure and stability of the pit or underground workings	Yes ☐ No ☒	Some finer material is likely to be susceptible to increased dispersion with disturbance. However, only a small amount of finer material is present compared with the mostly cobbly/ blocky nature of most of the mine waste. Refer to GCA 2022 (Section 3.2 and 4.0 in **Appendix 8-01**)
Backfill	Will the mining void be backfilled?	Yes ☒ No ☐	Progressive backfilling of the Robe Mesa pit will occur and be incorporated into the mine planning and scheduling. Refer to Sterilisation Report (**Supplement C** to this MP)

Figure 5.3.1 : Robe Mesa Pit

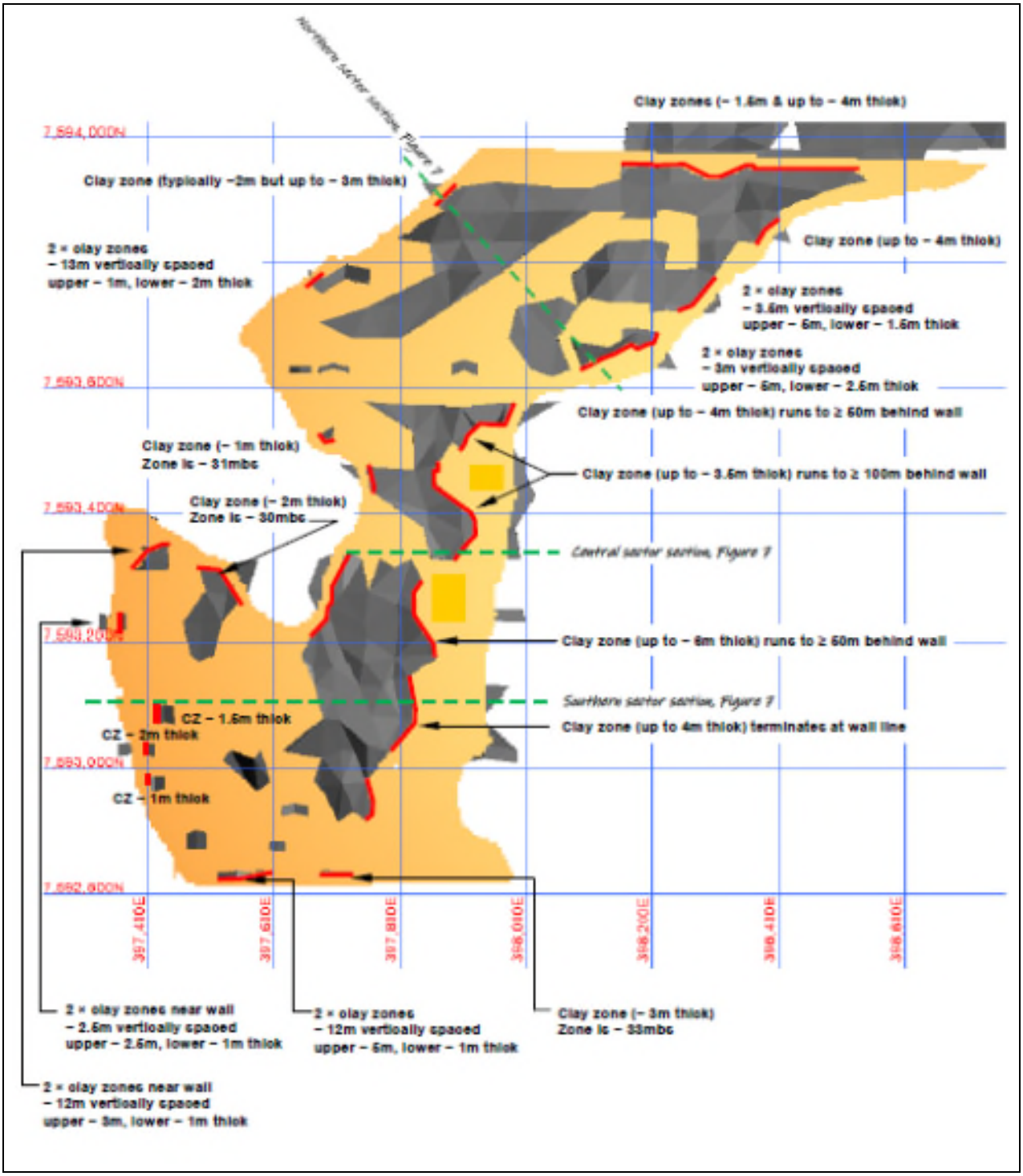


Figure 5.3.2 : Cross Sections of Robe Mesa mining Void

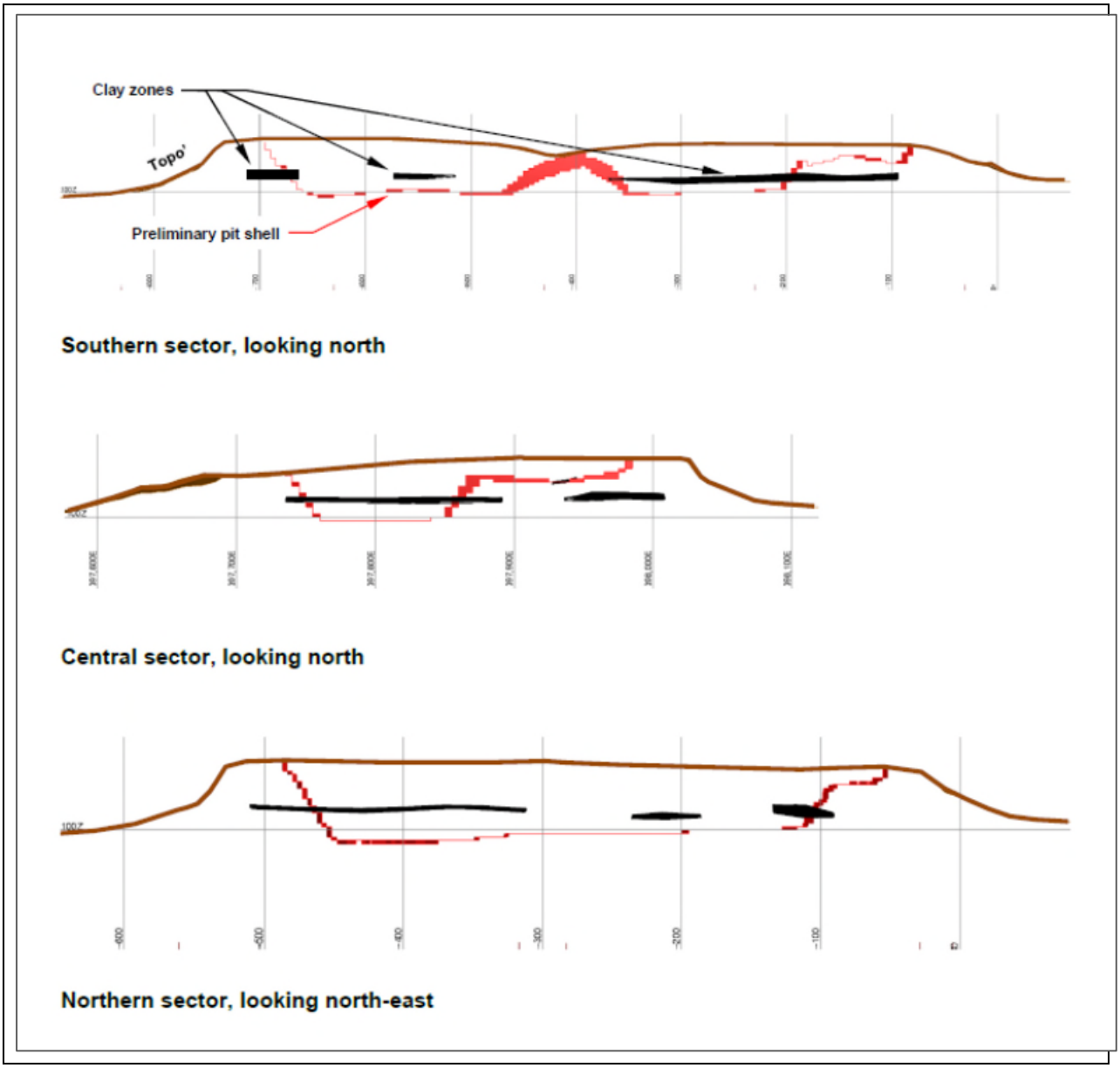


Figure 5.3.3 : Robe Mesa Final Landform Plan View

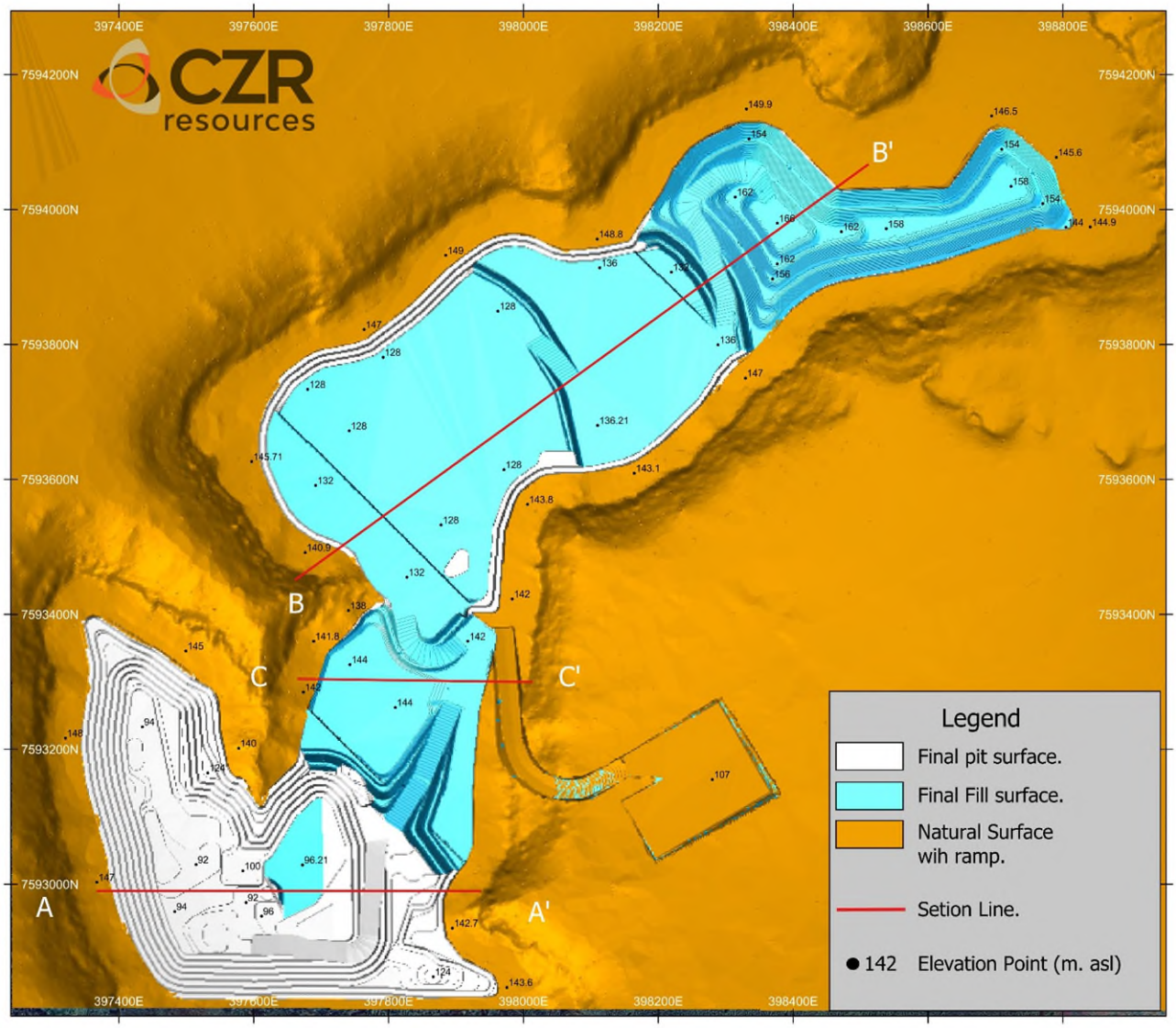


Figure 5.3.4 : Cross Section A to A′ with bench height detail

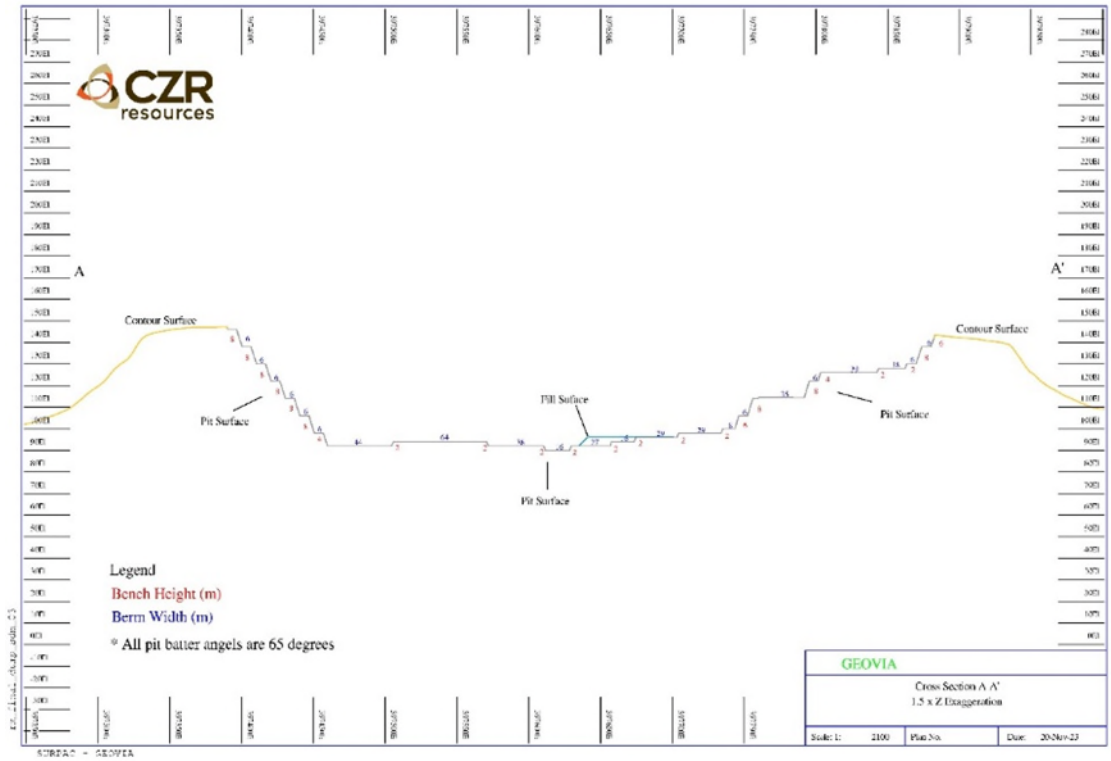


Figure 5.3.5 : Cross Section B to B′ with bench height detail

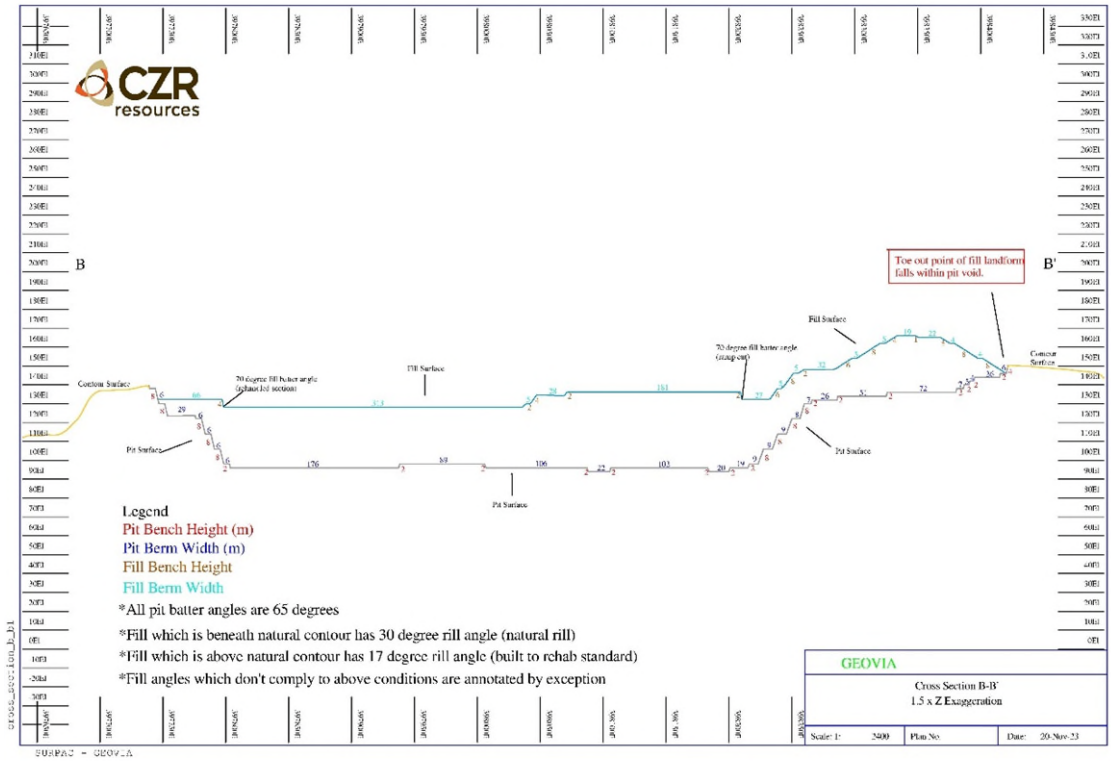


Figure 5.3.6 : Cross Section C to C'

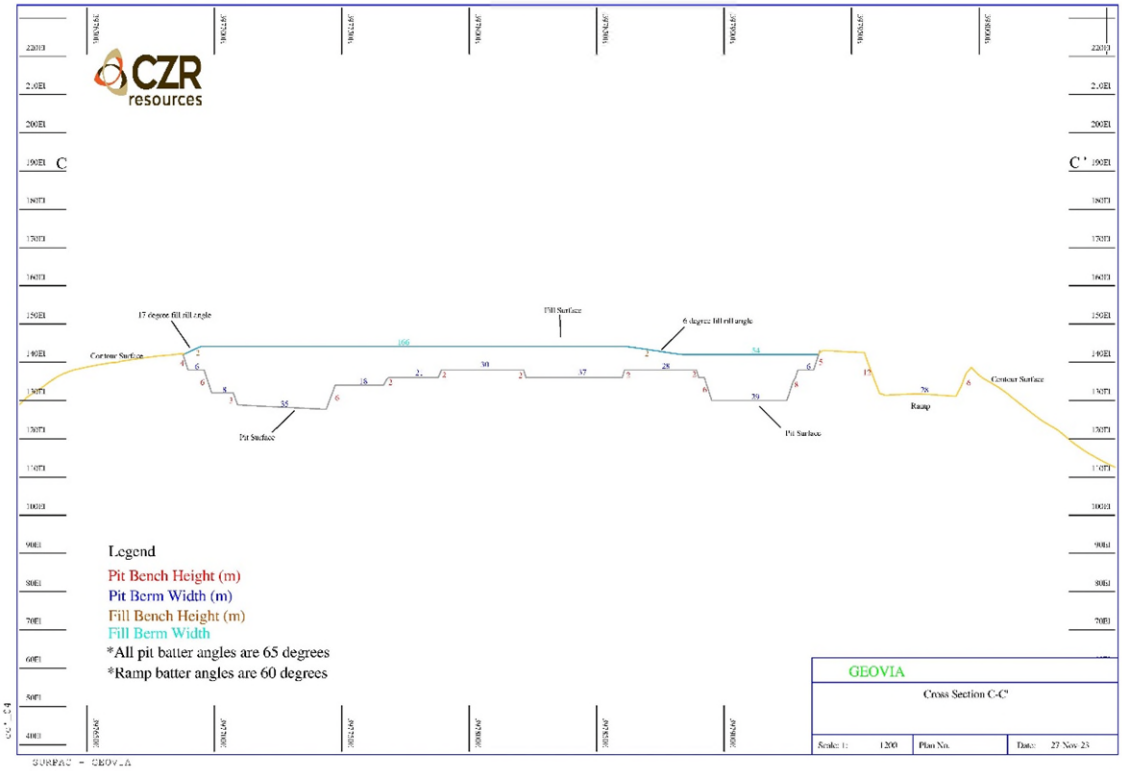


Figure 5.3.7 : Robe Mesa Backfill Detail

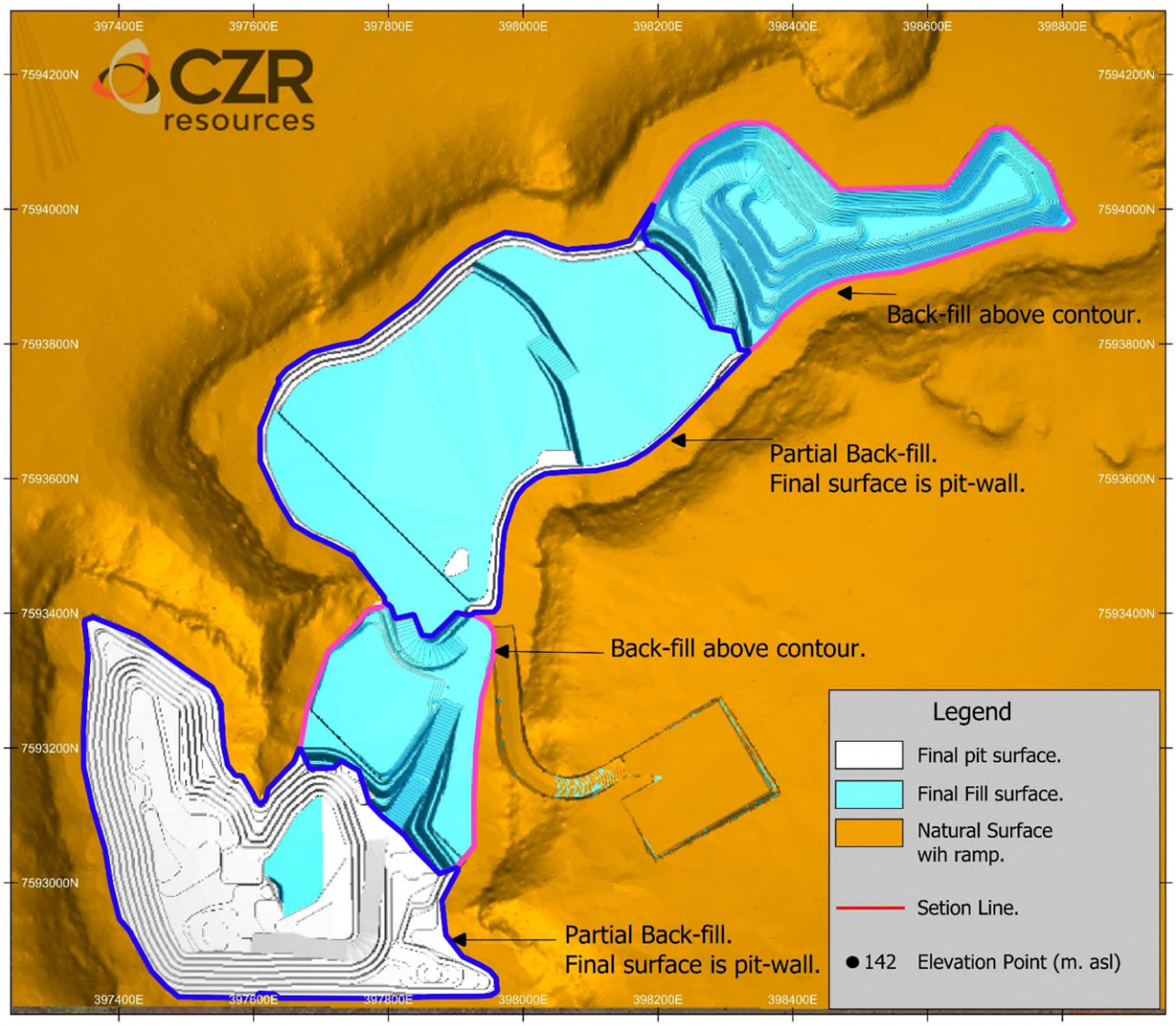


Figure 5.3.8 : Robe Mesa Post Mining Landform with Abandonment Bund Detail

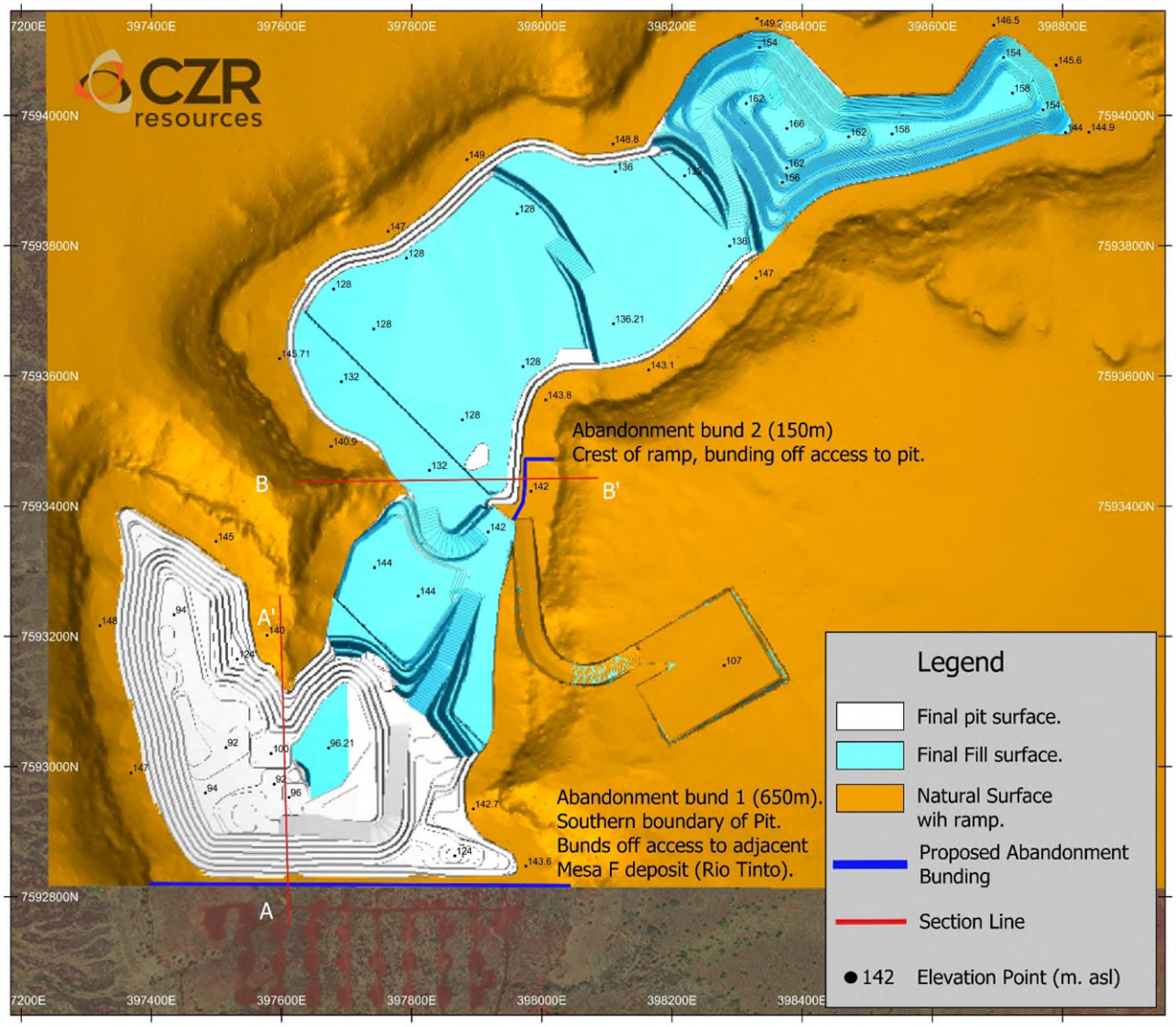


Figure 5.3.9 : Cross Section A to A' with abandonment bund

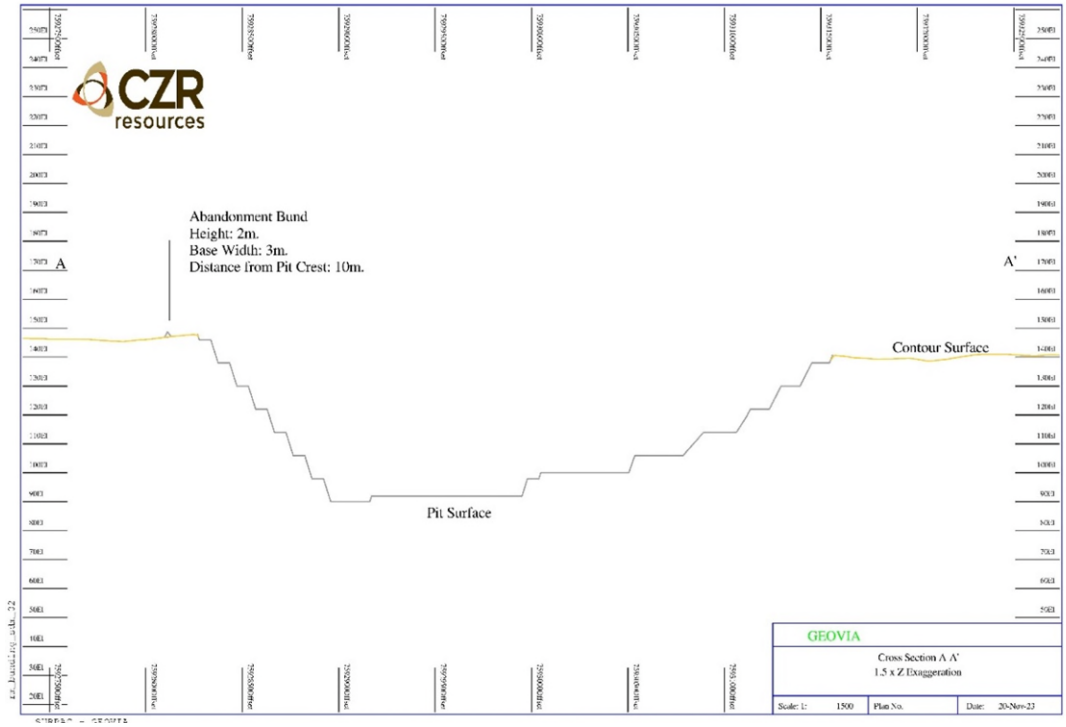
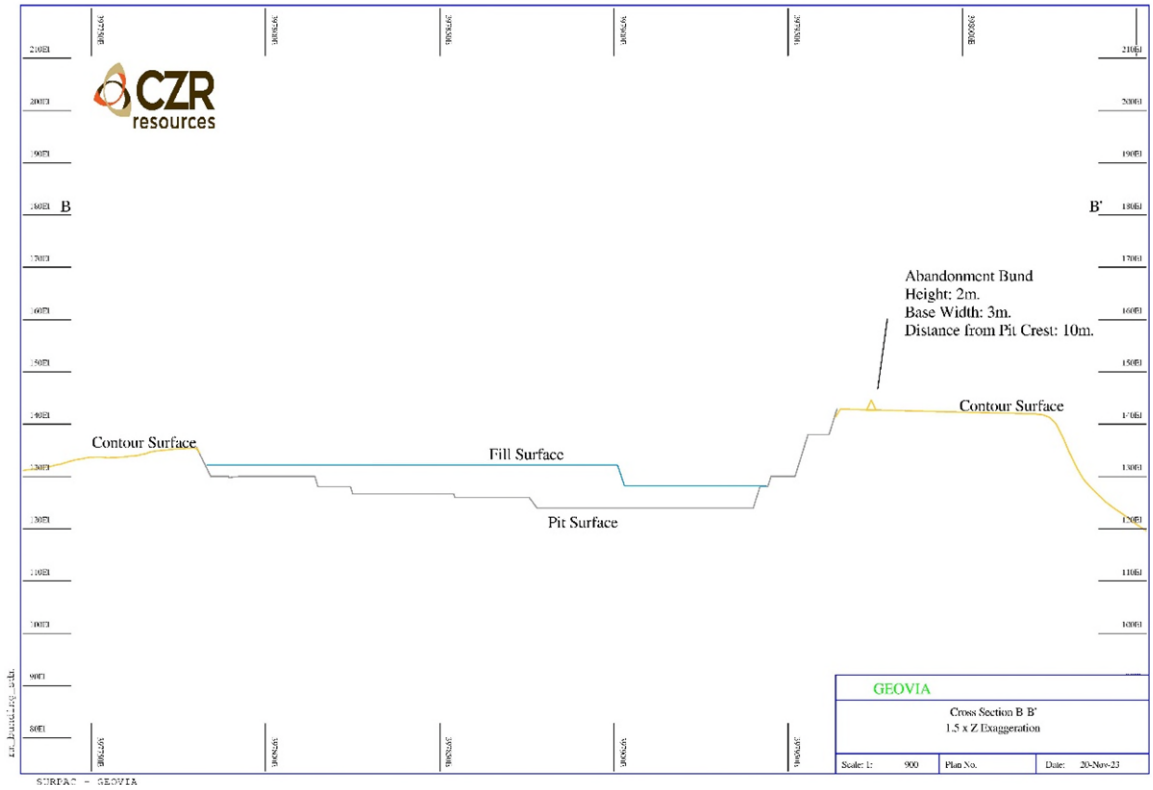


Figure 5.3.10 : Cross Section B to B' with abandonment bund



5.3.2 Run of Mine (ROM) – Robe Mesa ROM Pad

Located to the east of the Robe Mesa, the ramp descending from the Mesa will provide entry to the ROM Pad. The ROM ramp will be approximately 370 m long and consist of a cut section (approximately 250 m long) and a fill section (approximately 120 m long) as shown in **Figure 5.3.11** and Sections **Figure 5.3.12** and **Figure 5.3.13** with a 1:10 gradient.

Figure 5.3.11 : ROM Ramp

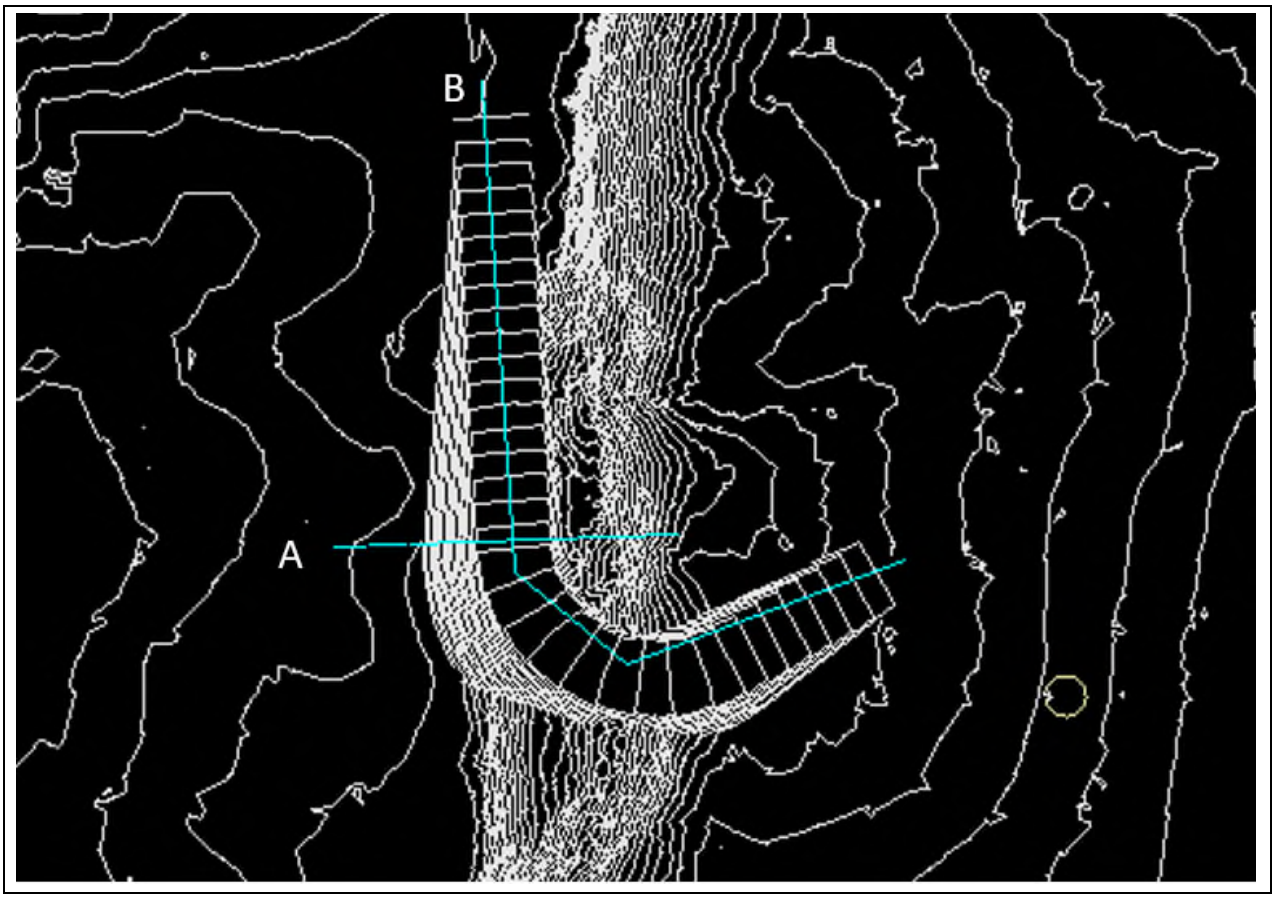


Figure 5.3.12 : ROM Ramp Section A

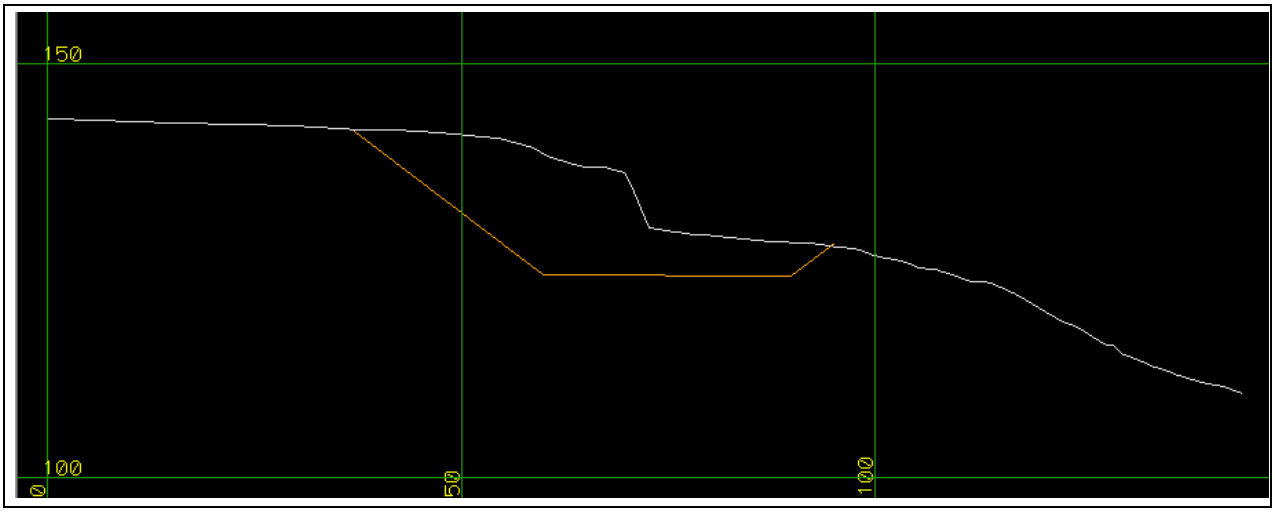
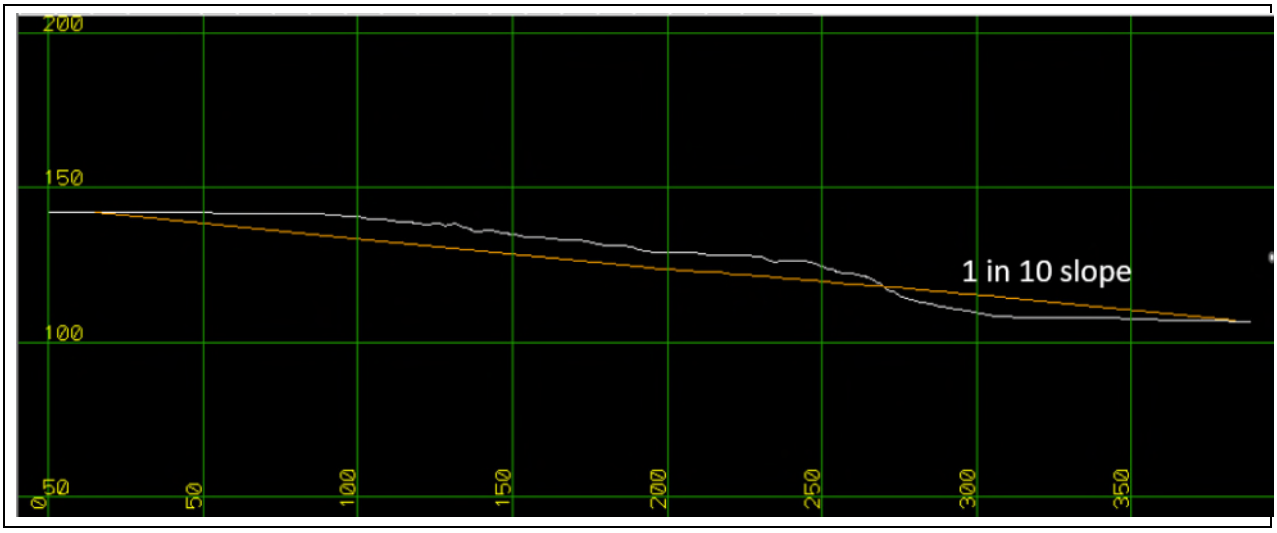


Figure 5.3.13 : ROM Ramp Section B



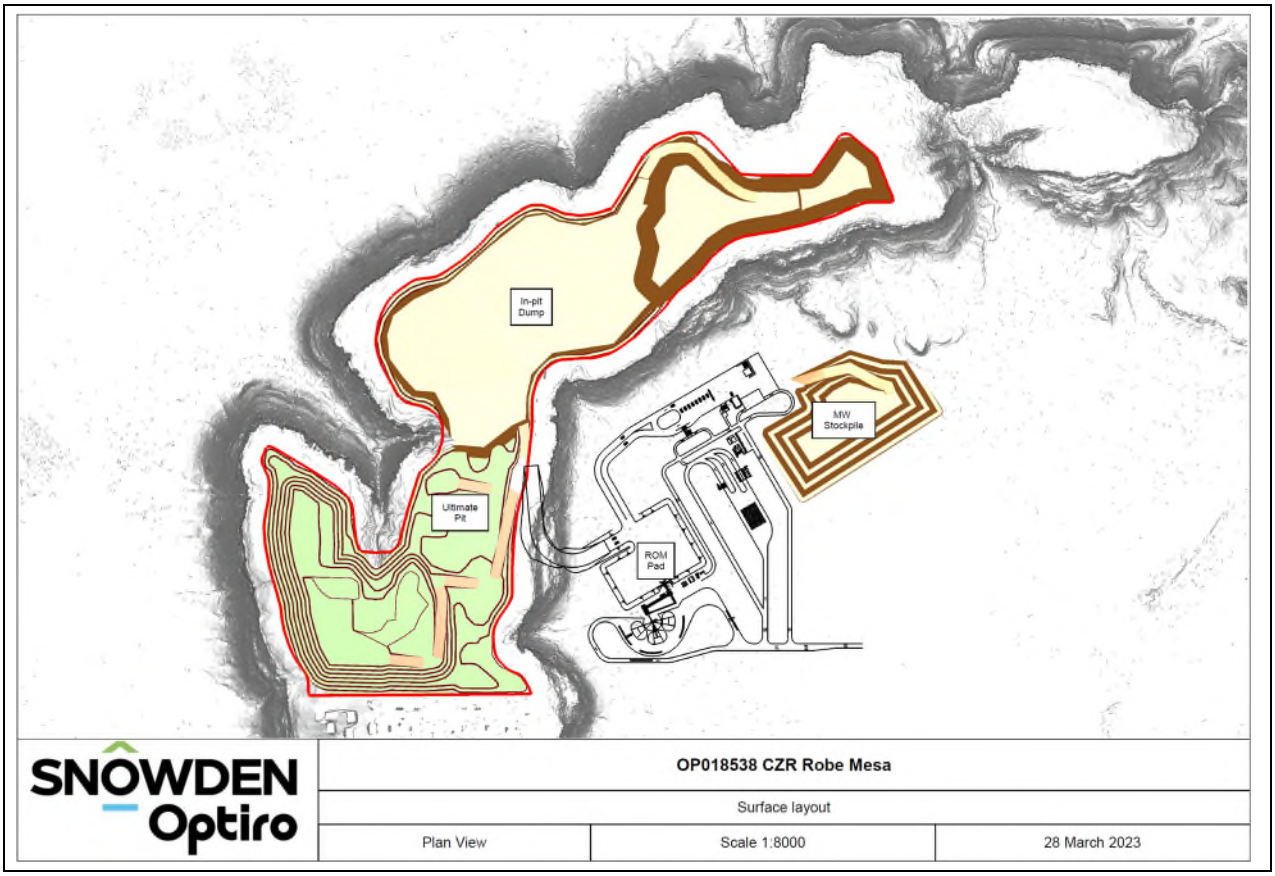
The ROM pad has been designed to be a maximum of 5 m high and be built up from natural surface to form a level surface, with any material required to level the area sourced from the open pit and Mine Admin pre-strip and waste rock material (**Figure 5.3.14**).

The ROM pad will be 3.3 hectares and result in 3.8 hectares of ground disturbance.

Mined ore will be delivered by haul truck and tipped onto grade fingers on the ROM Pad. A FEL will withdraw material from the ROM fingers and load the ROM Bin to feed the crushing plant. No direct-truck tip into the ROM Bin will occur.

Table 5.3.2 : M08/533 Key Mine Activity - Run-of-Mine (ROM) Pad			
Activity Type- Run-of-Mine (ROM) Pad			
Mine Activity Reference	Robe Mesa ROM Pad		
Total Area (ha)	3.8 ha		
Area per tenement (ha)	M08/355 = 3.8 ha		
Design description	ROM Pad will be located off the Mesa and be 5 m high with an area of 3.3 hectares and result in 3.8 hectares of ground disturbance		
Material Characteristics	Fibrous minerals	Yes ☐ No ☒	No fibrous material identified
	Radioactive material	Yes ☐ No ☒	No radioactive material
	Materials capable of generating acid and metalliferous drainage, including neutral drainage and saline drainage	Yes ☐ No ☒	Material *classifies as Non-Acid Forming (NAF), due to 'negligible-sulphides' (Total-S< 0.1 %) in a groundmass devoid of carbonates (GCA 2022)*
	Dispersive and/or erosive material that is capable of compromising the structure and stability of the pit or underground workings	Yes ☐ No ☒	

Figure 5.3.14 : Robe Mesa Mine Layout with ROM Pad and LG/MW Stockpile



5.3.3 Low-Grade Stockpile

The single low-grade stockpile has 10 m berm width with 10 m lifts. LG is stockpiled at this location until full, and any future LG will be sent to the waste dumps. The stockpile has a capacity of 3.4 Mt (**Figure 5.3.14**).

Table 5.3.3 : M08/533 Key Mine Activity – Low-Grade stockpile			
Activity Type – Low-Grade stockpile			
Mine Activity Reference	Robe Mesa Low Grade Stockpile		
Total Area (ha)	8.6 ha		
Area per tenement (ha)	M08/355 = 8.6 ha		
Design description	The low-grade stockpile is a run of mine product and will be fully reclaimed by the end of the proposed mining operation at Robe Mesa. Low-grade material during mining will be stored at this location until full, prior to processing. If the low-grade stockpile reaches capacity during operations, low-grade material will be stored within pit waste dumps until processing. The low-grade design is comprised of three lifts, with each lift having a height of 10m and 10m berms widths implemented. Total height of the stockpile is 30m. The toe of the stockpile is 100m RL and the crest is 130m RL. Natural rill angle of 30 degrees has been applied in the design. The stockpile has a capacity of 1.5M lcm (3.4 Mt).		
Material Characteristics	Fibrous minerals	Yes ☐ No ☒	No fibrous material identified
	Radioactive material	Yes ☐ No ☒	No radioactive material
	Materials capable of generating acid and metalliferous drainage, including neutral drainage and saline drainage	Yes ☐ No ☒	*All samples classify as Non-Acid Forming (NAF), due to 'negligible-sulphides' (Total-S< 0.1 %) in a groundmass devoid of carbonates (*GCA 2022)
	Dispersive and/or erosive material that is capable of compromising the structure and stability of the pit or underground workings	Yes ☐ No ☒	LG ore is expected to be 'fines rich' (GCA 2022) and will need to be managed appropriately to constrain erosion in stockpiles. Note, material remaining outside the pit will be returned to the pit (inside the mesa) at decommissioning, with erosion-control measures implemented during operations redundant post closure (GCA 2022).

5.3.4 Plant site

A flowchart for the Processing Facility is shown in **Figure 5.3.15**.

The current design of the processing plant consists of a staged crushing and screening plant that produces DSO fines only product.

ROM ore will be reclaimed from the ROM pad via FEL and transported to the crushing circuit and passed over vibrating screens (grizzly screens) which remove the fine material, with the oversized material reporting to

jaw crushers. Crushed rock from the jaw crushers then joins the undersize material from the grizzly screens, before being transported via the primary conveyor to the secondary crushing circuit.

The processing circuit will likely involve three stages of crushing and will indicatively require material from the primary crushing circuit to be screened prior to secondary crushing. The undersize material reports directly to the product conveyor while the oversize is fed to the secondary crushers and then to the tertiary screens. The tertiary screen undersize material also reports directly to the product conveyor while the tertiary oversize material is processed through tertiary cone crushers. The tertiary crusher product re-circulates through the secondary and tertiary circuits until it is fine enough to pass through the tertiary screens.

Additionally, the processing plant will produce approximately 7 000 tpa of stemming material, by primary and secondary crushing lower grade product in campaigns as required for drill and blast activities.

The product is conveyed to the product stockyard where it will be stacked by radial stacker into one of three stockpiles. Sampling of the product will be conducted to confirm compliance with product specifications and chemical composition. One stockpile is for completed product ready for haulage off site, one product is awaiting analysis and one active stockpile which is being built.

A FEL will pick fines product up from the completed stockpile and load road trains which transport the ore to the port facility.

The crushing, screening, stockyard, and road train load-out will be capable of processing up to 700 tonnes per hour, or approximately 4 - 5 Mtpa, operating up to 24 hours per day.

No waste or tailings will be produced by the processing facilities for the Proposal. Water misting sprays, skirting seals and dust box covers will control dust levels within the plant. Water will be used to condition the products prior to transport to the port. Water carts will manage dust around the plant.

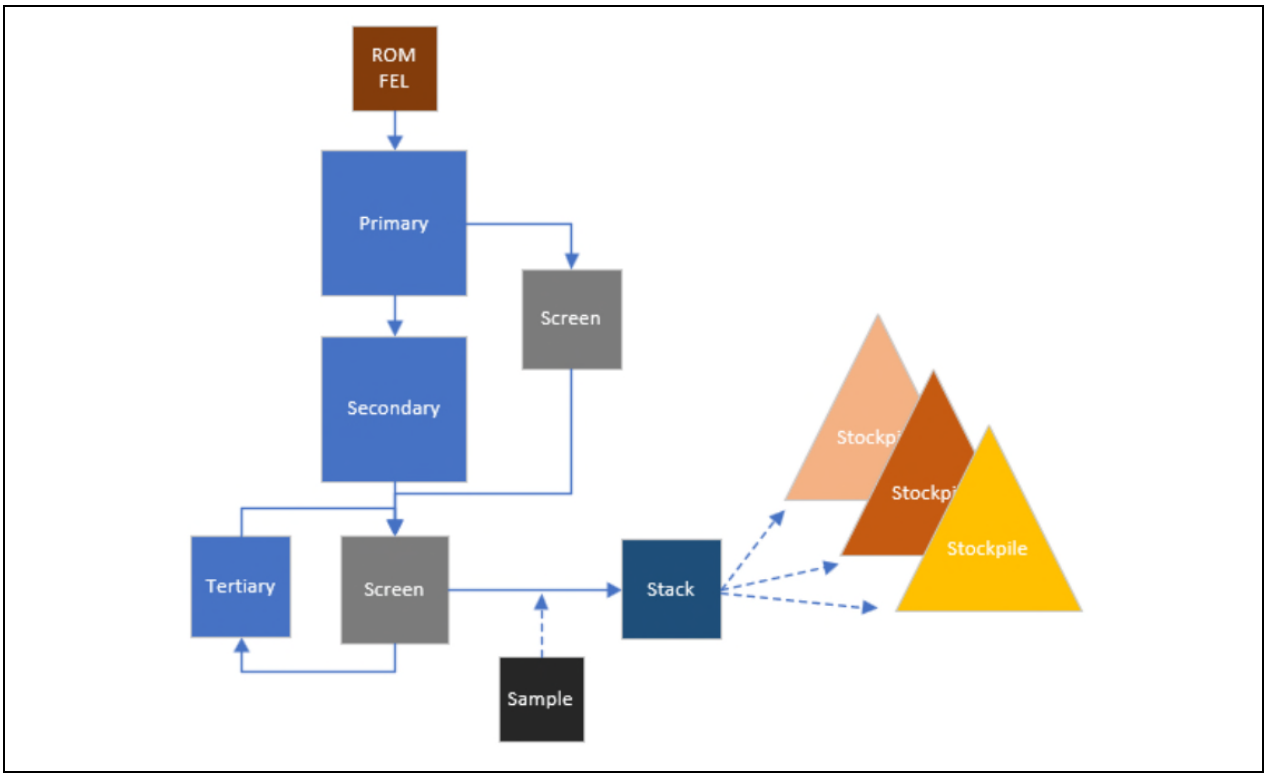
Mobile crushing and screening equipment may be utilised on an ad-hoc basis at various locations within the Proposal Disturbance Envelope, to supply construction material or supplement ore production feed while routine maintenance works on the processing plant are undertaken.

Activity details for the Processing Facility are summarised in **Table 5.3.4**.

Table 5.3.4 : M08/533 Key Mine Activity - Plant Site	
Activity Type - Plant Site	
Mine Activity Reference	Plant
Total Area (ha)	0.9 ha
Area per tenement (ha)	M08-533 - 0.9 ha
Design description	ROM ore will be reclaimed from the ROM pad via FEL and transported to the crushing circuit and passed over vibrating screens (grizzly screens) which remove the fine material, with the oversized material reporting to jaw crushers. Crushed rock from the jaw crushers then joins the undersize material from the grizzly screens, before being transported via the primary conveyor to the secondary crushing circuit. The processing circuit will likely involve three stages of crushing and will indicatively require material from the primary crushing circuit to be screened prior to secondary crushing. The undersize material reports directly to the product conveyor while the oversize is fed to the secondary crushers and then to the tertiary screens. The tertiary screen undersize material also reports directly to the product conveyor while the tertiary oversize material is processed through tertiary cone crushers. The tertiary crusher product re-circulates through the secondary and tertiary circuits until it is fine enough to pass through the tertiary screens.

Table 5.3.4 : M08/533 Key Mine Activity - Plant Site	
Activity Type - Plant Site	
	The product is conveyed to the product stockyard where it will be stacked by radial stacker into one of three stockpiles. Sampling of the product will be conducted to confirm compliance with product specifications and chemical composition.

Figure 5.3.15 : Robe Mesa Process Flow Diagram



5.4 Other Mine Activities

The other mining activities associated with the Proposal, listed alphabetically, include;

- Borefield, Dams – fresh water, water supply infrastructure
- Borrow pit or shallow surface excavation
- Buildings (other than workshop) or camp site
- Communication Tower
- Core Yard
- Diversion channel or drain
- Explosive Magazine
- Fuel storage facility
- Landfill facility
- Land (other than land under rehabilitation or rehabilitated land) that is cleared of vegetation and not otherwise described.
- Laydown or hardstand area
- Low grade stockpile class 2 (less than 15 m in height)

- Sewage Pond
- Topsoil and subsoil stockpile
- Transport or service infrastructure corridor
- Village (accommodation)
- Wastewater treatment plant
- Workshop

Infrastructure appropriate to support the site operations is planned with the facilities being temporary or modular in nature to suit the short term mine life. All facilities will be constructed and installed to meet statutory building regulations and codes and be in accordance with the State and shire permitting and approval requirements. The details of each activity are summarised in the Sections below.

5.4.1 Borefield, fresh water dams, and water supply infrastructure

Water will be sourced from a local bore field. Several sites have been identified within the tenement for water drilling and supply. In December 2022 CZR conducted extended pump testing of Production Bore 13 (PB-13), within the Duck Creek Dolomite Formation, approximately 8 km southeast of Robe Mesa. PB13 demonstrated it can supply the Robe Mesa demand of 17 litres a second, with excellent potable water quality, and as such CZR has purchased PB-13 from API. A Ground Water Licence (GWL) Number 180637 (3) was issued to API Management Pty Ltd (**APIM**) for the abstraction of 95 000 L per annum. As part of the PB-13 transaction an amendment to GWL for the entitlement of 540 000 kL/pa is under assessment with Department of Water and Environmental Regulation (DWER) (Application Reference number 056535) under the *Rights in Water and Irrigation Act 1914* (RiWI Act) to facilitate construction and operations of the Proposal. Additional 26D and 5C licences will be applied for to secure water supply alternative production bores, provide monitoring bore locations and allow operational rotation of bores to appropriately manage the aquifer.

Groundwater will be circulated to infrastructure via below ground water pipeline. Additional bores will be located on the Eastern side of Robe Mesa Area, within the Village Area and temporary road construction bores will be located along the access road. The sizes of water storage are based on 24-hour water demand. Several 50 m by 50 m Turkeys Nest will be constructed in various locations to support the Proposal. Dams and Turkey Nests will be fenced to prevent livestock access.

- 2 ML of storage at the mine process plant requiring approximately 3 600 m^2 land (60 x 60 m). The Pond will be constructed via cut out/fill earthworks construction and a HDPE lining. Turkey Nest Pond approximate size: 30 x 30 m base with 3:1 side slope and 2.5 m total depth (including 0.5 m freeboard).
- 100 m^3 of water storage at the village.

Operation of the Borefield will be undertaken in accordance with GWL conditions and associated Groundwater Operating Strategy (**GWOS**).

Although PB13 water supply is of potable water quality, a water filtration plant will be installed at the Robe Mesa Village. Water within the Proposal Area is fresh and able to be utilised directly (without processing) for site activities.

The daily requirement to support the Village demand, mining, and processing plant operation, including for dust suppression along the haul roads, is estimated to be 1.5 ML litres of water. Water carts will utilise water from the storage dam for dust suppression and a HDPE pipe will convey water to the storage tank at the crushing plant.

5.4.2 Borrow pit or shallow surface excavation

Several borrow targets have been identified within the Proposal Area. This borrow material will support construction activities and general maintenance over the life of Proposal, including use for subbase, base pavement layers and sheeting material for road construction.

Borrow pit target locations are spaced 5-7 km apart along the 38 km access road, still pending further site investigations for geotechnical assessment to be completed so the material can be assessed, and appropriate sites and volume requirements determined. Target borrow sites are

- Borrow nominated site 1: 1.5755 ha
- Borrow nominated site 2: 1.0738 ha
- Borrow nominated site 3: 1.0198 ha
- Borrow nominated site 4: 1.922 ha
- Borrow nominated site 5: 2.1067 ha
- Borrow nominated site 6: 1.085 ha

This borrow will be removed during the construction stage, and the borrow pit filled with suitable material (to natural surface level) to geotechnical support construction of the plant and ancillary infrastructure.

If required, the borrow material will be crushed and screened via a mobile crushing plant that will be used where required. A Works Approval and Licence under Part V of the EP Act will be sought for this activity.

5.4.3 Buildings (other than workshop) or camp site

An administration area will be constructed for the Proposal that includes office workspaces, ablutions, crib rooms, parking areas and other general office facilities. Buildings will be relocatable demountable ("dongas"), complexed together and the main communications facilities will be housed in this facility.

5.4.4 Communications Tower

The communication towers will be constructed with a steel frame and steel cabling for the support anchors. The tower will rest on a concrete base and solar panels will be used to power the facility. Communication towers will be installed at the Village and Mine Administration area with a microwave path hopping across telecommunication sites to complete the connect.

Site communications will be via a new microwave link and Wi-Fi will be used to distribute communications within the administration and workshop facility areas and accommodation facility. A UHF 2-way radio system will be used for control of the operations at the site and general site management.

5.4.5 Core yard

For future exploration activities of surrounding areas, a small core yard may be installed at either the Village, or Mine site on land that is already marked for disturbance. As the requirement for the core yard is yet to be confirmed, the exact location is yet to be defined.

5.4.6 Dam – fresh water

See Borefield above.

5.4.7 Diversion channels or drains

To protect the critical infrastructure, the following measures have been allowed for:

Roads on the perimeter of the mine site and within the 100-year flood level have been raised a minimum 500mm above the estimated 100-year flood level. This will protect the mine infrastructure from the 100-year

flood extents. In addition, the roads have also been designed with floodways at 300mm above the estimated 100-year flood level to allow the internal mine site basins to overtop at controlled sections of the road to protect upstream infrastructure.

Runoff from all built infrastructure has been directed to basins with all external catchments to be diverted around site and released to natural.

A high-level drainage model using XP-STORM software has been prepared for preliminary sizing of open drains, culverts, and basins.

Due to the limited area for basin locations, two basins have been proposed (rather than one larger basin) and the basin catchment areas separated as follows:

- Basin 1: Haulage Contractor Area and Process Plant.
- Basin 2: Mine Office/Administration Areas.
- Stormwater basins to be sized for 1:20 ARI, 24 hr event with 150mm freeboard to road pavement subgrade (minimum 450mm to road floodway shoulder). CZR will monitor basin water levels and regularly pump out the basins to ensure basins are empty and capacity is maintained for the next significant storm event. Water will be used for road dust suppression and process stockpile ore conditioning to bring product moisture to dust extinction moisture (DEM) level of 6.91%. For larger events, and for situations where the basins have not been regularly pumped dry, the roads adjacent to the basins have been designed with floodways to allow the internal mine site basins to overtop at controlled sections of the road to protect upstream infrastructure.

Culverts and drains to be sized for the critical 1:20 ARI event with minimum 300mm freeboard to shoulder. Drains have been designed at minimum 0.3 m below pavement subgrade. Culverts are designed with rock protection at the culvert outlets to reduce scour potential due to the likely erosivity of the soil.

5.4.8 Explosive Magazine

The Explosive Magazine has been separated from other facilities by minimum distances specified in Table 3.2.3.2 of AS2187.1 Explosives - Storage, Transport and Use - Western Australia. The ANFO facility has been placed along the Eastern borefield access track 3.1 km away from Village, 3.8 km from the mine administration area and 4.35 km from the Pit. These facilities will be constructed in accordance with statutory requirements.

A licence under the Dangerous Goods Safety (Security Sensitive Ammonium Nitrate) Regulations 2007 will be obtained by the Mining Contractor. The drill and blast team will be responsible for licensing, construction, and day-to-day management of the facility.

The Explosives Magazine will be used to house the bulk ammonium nitrate and will be managed in accordance with safety guidelines when producing bulk ANFO for blasting operations.

5.4.9 Fuel Storage facilities

Fuel storage facilities will include above ground, self-bunded tanks located indicatively at the Processing Plant, Haulage Area, Mine Administration and Village. Fuel tanks are designed and manufactured to AS1940 and AS1692.CAT.3 and fitted with spill grates for each tank to ensure the capture of any fuel spills whilst refuelling.

The storage and handling of fuel is managed in accordance with the site Safety Management Plan and under the Dangerous Good Act 2004 (WA). A Works Approval will be sought for the approval of these facilities as required under Part V of the EP Act and a Dangerous Goods Licence obtained from DEMIRS prior to installation.

5.4.10 Landfill facilities

A landfill for putrescible waste disposal of up to 3,000 tonnes per annum will be located away from Robe Mesa, positioned within 1 km from the Robe Mesa Village on L 08/297.

A Works Approval will be sought for the approval of these facilities prior to site activities commencing.

5.4.11 Land that is cleared of Vegetation

Land (other than land under rehabilitation or rehabilitated land) that is cleared of vegetation and not otherwise described.

5.4.12 Laydown or hardstand areas

Several laydown and hardstand areas will be required for the Proposal, mainly within the Robe Mesa Mine Operations Area, NPI areas, Processing Plant, Drilling Contractor, and Village areas.

These areas will be utilised to store miscellaneous equipment.

5.4.13 Low-grade ore stockpile (class 2)

A low-grade stockpile will be positioned off the mesa to the east of the mine administration area, the stockpile will not exceed 15 m in height. Refer to 5.3.3.

5.4.14 Mobile Plants

Mobile plants may be operational onsite to support construction activities and operational activities on an ad hoc basis. These plants may include:

- Crushing and Screening Plant;

All activities will be undertaken in accordance with a Works Approval which will be sought if they are required.

5.4.15 Power Generation

Power generation throughout the site will be by high efficiency diesel powered relocatable gensets. The gensets will be located as close to the power load as possible, and if required will have supplementary fuel tanks to minimise refuelling events.

The main power consumption will be within the crushing and screening plant, mine operations centre administration and Village areas. Adequate redundant capacity will be installed to ensure continuity of supply.

All electrical works will be undertaken by licensed electricians.

5.4.16 Topsoil and Subsoil stockpiles

Topsoil and sub-soil will be stored near the areas that will be cleared and used for progressive rehabilitation. Based on industry experience in the area, topsoil and subsoil can be stripped to depths of 0.10 m and 0.30 m respectively, however topsoil to a depth of 0.20 m will be salvaged, for a maximum combined depth of 0.50m.

Topsoil and subsoil will be stockpiled on flat areas that utilise future pit areas in addition to areas adjacent to infrastructure. Stockpiles will be paddock tipped and pushed up for a batter angle of natural rill. Topsoil will be stored at a maximum height of 2 m, and subsoil 4 m.

Topsoil will be preferentially stripped and stored over subsoil, and where possible the Proponent will salvage and store subsoil as an alternate growth medium to topsoil to support rehabilitation. As this is only an additional source of material, it is not considered necessary to salvage all of this material. Therefore, storage for the full balance of subsoil that may be possible to salvage, has not been made for the purpose of limiting disturbance to vegetation.

Major areas of disturbance will occur for the transport corridor (107 ha), Robe Mesa Pit (68 ha), ROM Pad and Mine Administration Area, and Village (25 ha) with a total disturbance of 270 ha for the whole Proposal. Included in this value, is the availability of 24.9 ha for topsoil and subsoil stockpile allocations. These locations have been identified to minimise rehandling of materials and encourage rehabilitation. There will be adequate stockpile rehabilitation material volumes available within the Proposal Area to meet the rehabilitation, with the soil utilised as soon as possible whenever practical within the Disturbance Envelope.

5.4.17 Transport or service infrastructure corridor

Ore will be hauled from Robe Mesa Processing Plant stockpile to the North West Coastal Highway via the purpose-built unsealed mine site access road, which will handle light vehicle and road trains. The main access road is designed with an 8 m unsealed main surface and 1 m gravel shoulder of either side of the road.

Other access roads within the Proposal will be unsealed and provide light vehicle access to borefield, explosive magazine, access borrow material and facilitate alternative access/egress from site in case of emergency. The pastoralist will be consulted prior to undertaking work on shared access roads and tracks.

Within the Proposal Area, infrastructure corridors have been designed to capture all disturbance for pipelines, roads, easements, and topsoil stockpiles, if required. The proposal does not include the provision of overhead powerlines or gas pipelines.

5.4.18 Village Accommodation

The Accommodation Village will be constructed to accommodate approximately 120 persons. The Village will include single person ensuite demountable units ("dongas"), they will be supported by an industry standard dry mess and dining room, social hub, first aid room, laundry and ablution blocks, outdoor recreation areas, fuel storage, vehicle parking, communications tower, and Waste Water Treatment Plant (**WWTP**) (see Section 5.3.2.14).

The facility will be sited to provide an aesthetic outlook for the residents, and minimally landscaped with local native trees and shrubs.

The facility will be serviced by a containerised wastewater treatment facility and evaporation spray field. Potable water will be processed onsite from raw water sourced from bores. Power will be provided by diesel powered generators located at the facility.

The facility will be constructed and installed to meet statutory building regulations and codes and be in accordance with the State and Shire permitting and approval requirements.

A smaller temporary construction / exploration camp accommodating up to 60 people will be established on the Village footprint to allow construction workforce to be housed.

5.4.19 Wastewater Treatment Plant (WWTP) and Associated Sprayfield

The Robe Mesa Village will be equipped with a Wastewater Treatment Plant and associated spray fields (for the discharge of treated effluent)

The Mine Operations area will have a septic system installed.

A Works Approval will be sought for the approval of these facilities prior to site activities commencing.

5.4.20 Workshops and Construction compounds

Workshops will be utilised at the Mine for Heavy Mobile Equipment servicing, boilermaker services and drill maintenance will be constructed adjacent to the administration buildings and will include a warehouse, office, wash bay with oil/water separator, sediment control structures, and Go Line and Dead Line areas.

The Processing Facility will have a small workshop facility comprised of sea containers with a dome shelter and will include an office / control room facility.

The Haulage Facility will have a small workshop and office.

Construction compounds will be used for Robe Mesa NPI construction and incorporated into store/warehouse facilities during normal operation.

The facilities will generally consist of covered repair and servicing bays, with gravel hardstand work areas surrounding them. The facilities will be supported with water and compressed air services, where needed, and be adequately lit for night works. Disposal of used oil products from servicing of vehicles will comply with statutory requirements.

5.5 Disturbance envelopes for activities

The calculated disturbance envelope is 270 ha and is shown in **Figure 5.5.1.** An ESRI shapefile for the disturbance envelope has been provided with the online submission of this Mining Proposal

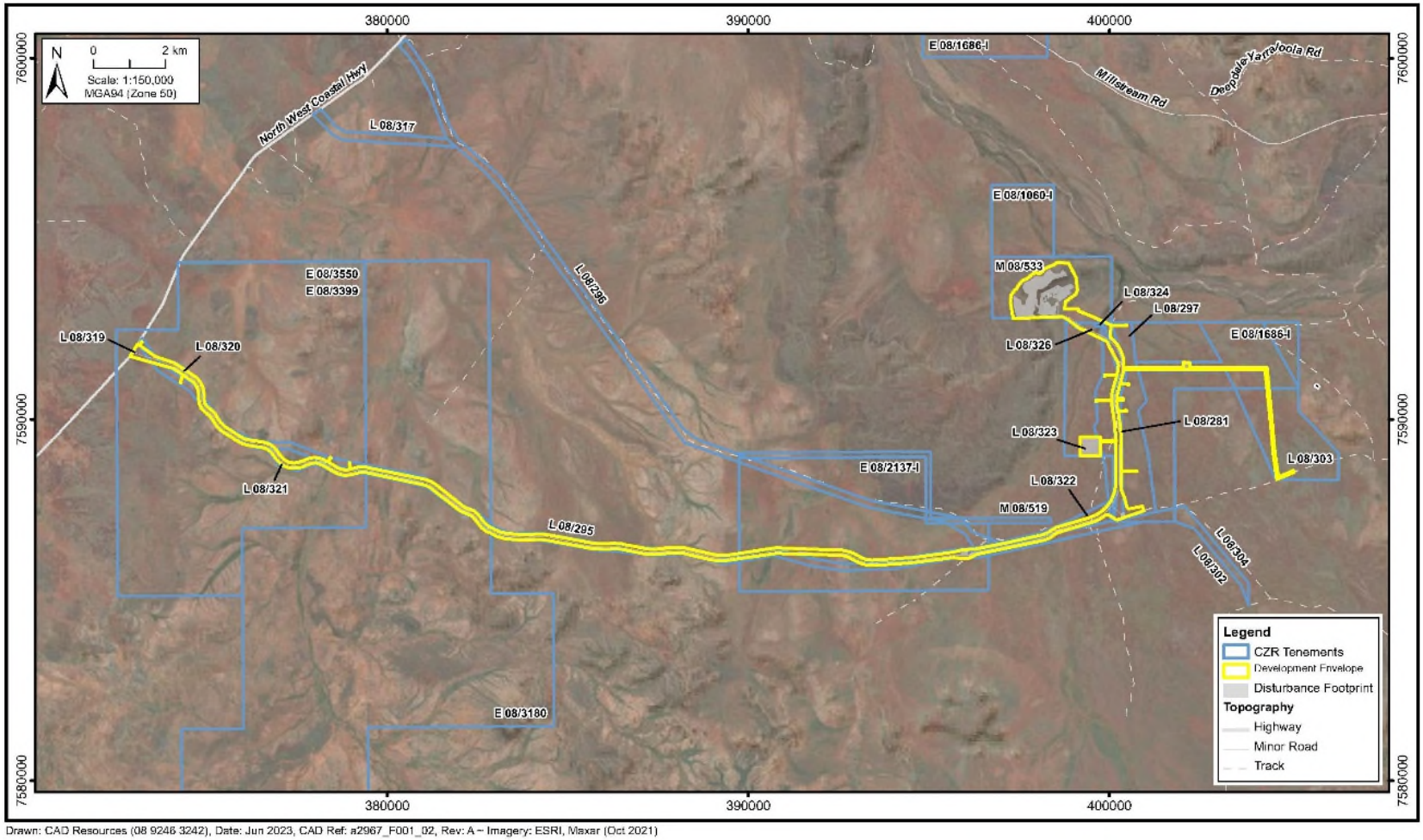
5.6 Site Plan

Please refer to Proposal Site Plan (**Figure 5.6.1**) showing disturbance and activities. Individual tenements and disturbance activities have been provided in section 5.2.

5.7 Design details for tailings storage facilities

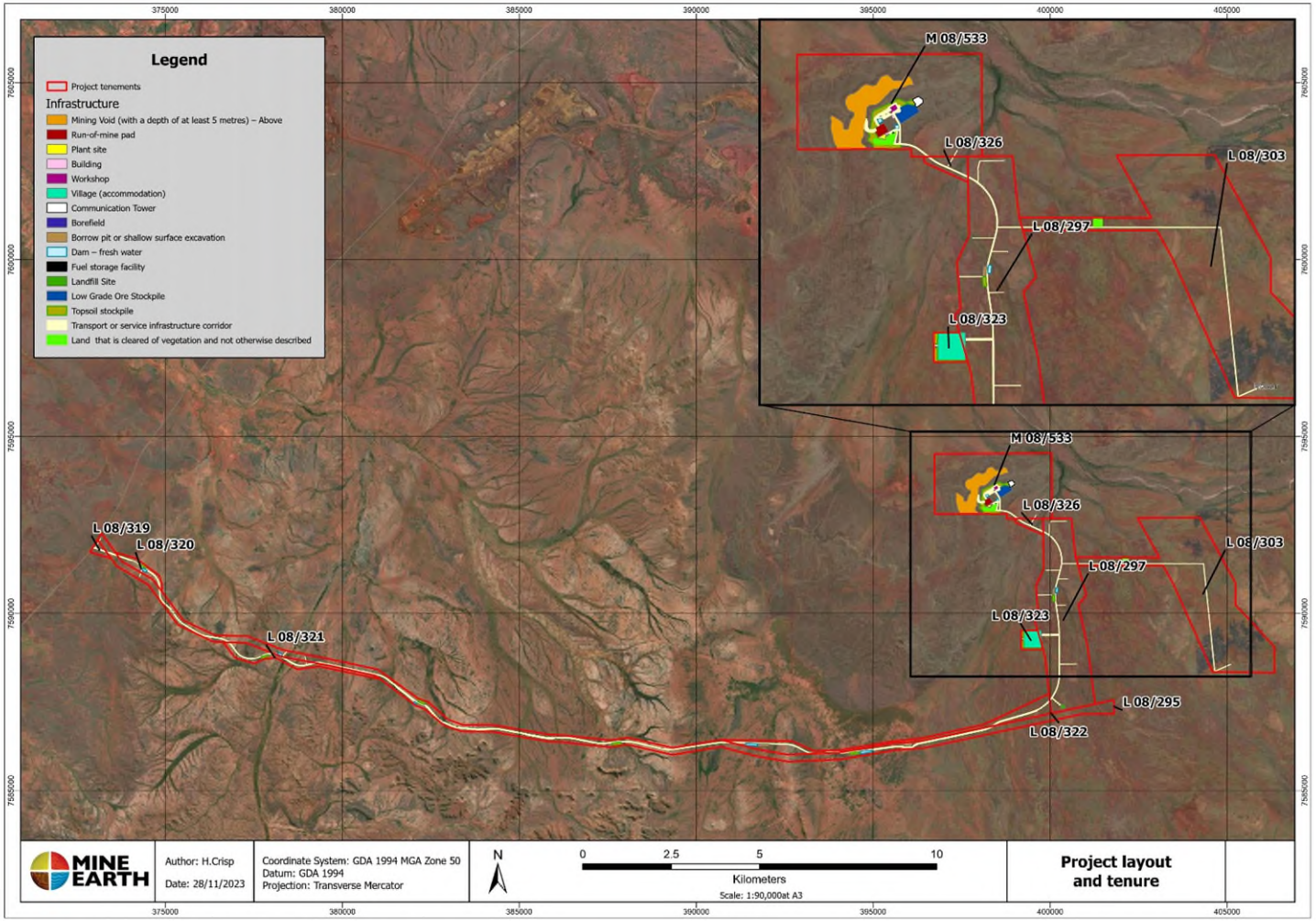
The Proposal is for a dry processing operation and no Tailings Storage Facility (**TSF**) is required. All material crushed at the site will with be transported off site as product or used as stemming in drill and blast practices.

Figure 5.5.1 : Proposal Disturbance Envelope



Drawn: CAD Resources (08 9246 3242), Date: Jun 2023, CAD Ref: a2967_F001_02, Rev: A – Imagery: ESRI, Maxar (Oct 2021)

Figure 5.6.1 : Proposal Site Plan



6. Environmental Legislative Framework

The key environmental approvals and statutory requirements relevant to the Proposal are outlined in **Table 6.1.1**.

Table 6.1.1 : Key Approvals and Environmental Legislation

Relevant legislation	Environmental factor regulated/affected	Relevant approval/requirement and status of relevant approval
Environmental Protection and Biodiversity Conservation Act 1999	• Biodiversity: Matters of NES	Referral under EPBC Act – if project is considered likely to have a significant impact on Matters of NES. Environmental investigations of fauna and flora on site have determined that the proposal will not have a significant impact on Matters of NES.
Environmental Protection Act 1986 • (Part V) Native Vegetation Clearing Permit	• Flora and Vegetation • Terrestrial Fauna • Inland Waters	CZR are proposing that the project be assessed via the Native Vegetation Clearing Permit (**NVCP**) process, under Section 51(E) of the EP Act. A NVCP application was submitted in June 2023 and is currently being assessed (CPS 10248/1). The Application Area aligns with this Mining Proposals Disturbance Envelope.
Mining Act 1978 • Mining Proposal • Mine Closure Plan	• Biodiversity • Water Resources • Land and Soils • Rehabilitation • Social Surroundings	This Mining Proposal includes auditable outcomes for key DEMIRS factors, to be approved by DEMIRS to ensure that the impacts on the key DEMIRS factors are mitigated to an acceptable level. The Mine Closure Plan that accompanies this Mining Proposal will be revised every 3 years or with subsequent Mining Proposal applications. It will include auditable closure and rehabilitation outcomes and criteria which will be defined and approved by DEMIRS to ensure that impacts on key DEMIRS factors are mitigated to an acceptable level. Environmental monitoring programmes during operations and for some time post closure will be conducted in accordance with the approved schedules to confirm the achievement of the set environmental outcomes. Annual Environmental Report on compliance with tenement conditions, commitments made in the MP and MCP submitted to DEMIRS for assessment.

Table 6.1.1 : Key Approvals and Environmental Legislation		
Relevant legislation	**Environmental factor regulated/affected**	**Relevant approval/requirement and status of relevant approval**
Environmental Protection Act 1986 (Part V) • Works approval • Environmental Licence	• Emissions and discharges to air, land, and water from a Prescribed Premises • Environmental Pollution	Prescribed premises categories required for the Project include: • Category 5 - Processing or beneficiation of metallic or non-metallic ore • Category 85 - Sewage Treatment and Discharge • Category 89 – Putrescible Rubbish Tip / Landfill Works Approval Applications are to be submitted in Q1 2025. It is yet to be confirmed if a Works Approval will be required for construction activities involving category 12 - Borrow material produced by a mobile crushing and screening plant.
Rights in Water and Irrigation Act 1914 • Licence to construct a bore (26D) • Licence to take water (5C)	• Abstraction of groundwater the Hamersley Fractured Rock aquifer and/or Combined Fractured Rock West aquifer. • Groundwater quality and quantity • Groundwater Dependent Ecosystems	5C licence has been sought to take groundwater within the Hamersley Fractured Rock Aquifer. CZR acquired bore PB13-3 from API Management Pty Ltd (APIM) in April 2023. PB13-3 will supply the 17 L/s Robe Mesa project water demand. Following the granting of L08/303, on 2 June 2023, CZR applied to transfer PB13-3 from the APIM held GWL, to a new CZR GWL (Water Online Ref 056535). This GWL application also included a request to increase the water allocation to 540 ML/a and a level H2 Assessment Report (AQ2 2023 and 2024b). Multiple 26D Licences have also been sought to construct groundwater bores for exploration and monitoring (CAW207170; CAW207770; CAW207771; CAW207772).
Aboriginal Heritage Act 1972; • Section 18 Permit	• Aboriginal heritage • Disturbance to matters of Aboriginal heritage significance	CZR and Robe River Kuruma People have signed a Native Title Agreement that defines requirements for heritage surveys on CZR tenements. A Cultural Heritage Management Plan has also been developed with the Robe River Kuruma People.
Dangerous Goods Safety Act 2004 • Dangerous Good Licence	• Contamination of soils, groundwater, and surface water (hydrocarbon spills) • Fire risk (combustion of stored flammable goods)	The storage and management of hydrocarbons will be regulated under Part V of the EP Act and the Mining Proposal / MCP however the DG Licence provides additional mitigation for the design and storage of larger volumes of dangerous goods (if large volumes of hydrocarbons (>100,000 L) are required to be stored on site). Dangerous Goods Licence for the diesel storage at the Mine, Processing Plant and Village is anticipated to be submitted in Q1 2025, with the successful Mining Contractor also applying to DEMIRS for Dangerous Goods Licence to for ANFO and Drill and Blast requirements in 2026.

Table 6.1.1 : Key Approvals and Environmental Legislation		
Relevant legislation	**Environmental factor regulated/affected**	**Relevant approval/requirement and status of relevant approval**
Health Act 1911 (Treatment of Sewage and disposal of Effluent and Liquid Waste) Regulations 1974 • Permit to construct apparatus for the treatment and disposal of sewage	• Treat and dispose sewage and wastewater	If discharge of waste water does not trigger a prescribed activity under Part V of the EP Act, the Health Act Permit is the primary approval to regulate health and environmental matters associated with the treatment and potential discharge of waste water effluent on site.

7. Stakeholder Engagement

7.1 Overview of stakeholder engagement strategy

Platform Communications and CZR is also developing a Stakeholder Engagement Plan, which will:

- detail stakeholder engagement objectives, communication protocols and documentation procedures
- identify and classifies stakeholders according to level of interest and influence and the types of issues they are likely to be concerned about, as well as current perceptions of CZR resources
- identify stakeholder risks and sensitivities and provides mitigation strategies to deal with them
- assess social risks and opportunities with the Project and management measures
- propose engagement processes for the life of the mine and resources required to deliver the process
- evaluate/assess the effectiveness of stakeholder and community engagement

CZR is focussed on building and maintaining strong relationships with key stakeholders and community members interested in, or affected by, the Project. This is achieved by maintaining regular contact with stakeholders and keeping open lines of communication.

To date, meetings have been held with a range of key stakeholders, aimed to:

- Inform stakeholders about the proposed project
- Identify areas in which stakeholders would or may be affected
- Collect feedback and stakeholder's concerns regarding the proposed project
- Ensure there are mechanisms in place for stakeholders to exchange information and discuss concerns with CZR.

To date, stakeholder engagement has resulted in;

- Native Title Agreement for Robe Mesa with RRK people
- Negotiations over land access agreements
- Regular updates with stakeholders on the Project
- Understanding and mitigating potential social risks and enhance opportunities
- Strong relationships with stakeholders and the community

7.2 Key Stakeholders

Since acquiring tenements in 2014, CZR has consulted broadly during ongoing investigations, design, and evaluation of the Project. The key stakeholders and their areas of interest are summarised in **Table 7.2.1**. A stakeholder register and records of engagement are maintained and is provided in Supplement D.

Table 7.2.1 : Stakeholder and Area of Interest

Stakeholder Group	Stakeholder	Area of Interest
Federal Government Department	Department of Climate Change, Energy, the Environment and Water	• Administers the EPBC Act 1999, environmental impact assessments of matters of national environmental significance.
State Government	Department of Water and Environmental Regulation (DWER)	• Administers the *Environmental Protection Act 1986* • Environmental impacts and assessments • Provision of licences to take water and permits to construct bores • Groundwater quality and quantity. • Part V (EP Act), Control of Pollution

Table 7.2.1 : Stakeholder and Area of Interest		
Stakeholder Group	**Stakeholder**	**Area of Interest**
	Department of Mines, Energy, Industry Regulation and Safety (DEMIRS)	• Administers *Mining Act 1978* and Regulations • Tenement conditions • Mining proposals, programs of work • Mining rehabilitation fund • Rehabilitation standards • Safety in resource sector
	Department of Biodiversity Conservation and Attractions (DBCA)	• Administers *Biodiversity Conservation Act 2016* • Flora, fauna and habitat conservation. • Interest in projects that are located on DBCA managed land • Baseline surveys and authority to take flora and fauna
	Pilbara Ports Authority	• Responsible authority for the operation and expansion of the Port of Ashburton. • Proposal development and positioning – marine and landside • Development applications and approvals • Multi-user facilitation • Unlocking stranded assets • Innovative trade growth utilising existing infrastructure • Ashburton Northern Strategic Industrial Area (**ANSIA**)
	Main Roads Western Australia (MRWA)	• Management and use of public roads, including Restricted Access Vehicles network.
Local Government	Shire of Ashburton	• Benefits to local economy and community • Minimise impacts to local community and infrastructure • Use of public roads and traffic management • Dust mitigation • Enhance local employment / contracting opportunities • Compliance with building, health, sewage and other local government regulation.
Traditional Owners	Robe River Kuruma Aboriginal Corporation Buurabalayji Thalanyji Aboriginal Corporation	• Early engagement • Cultural heritage values • Local indigenous employment and business opportunities • Indigenous sponsorship / funding opportunities • Native title rights
Regional Organisations	Regional Development Australia – Pilbara	• Economic development of Pilbara region
	Pilbara Development Commission	• Job creation and promotion of economic and social development within the region • Collaboration benefits – reduction in transport, haulage diesel
	Ashburton Northern Strategic Area (ANSIA)	• Regional development • Innovative solutions to industry development
	Development WA	• State development • Unlocking stranded assets • ANSIA - future development
Industry	Peers / Competitors	• Collaboration opportunities • Multi-user facilities
	Industry Associations	• Innovative project design • Job creation and supplier opportunities
	Suppliers	• Impacts to existing supplier and service arrangements and requirements • Ongoing contract/employment opportunities

Table 7.2.1 : Stakeholder and Area of Interest		
Stakeholder Group	**Stakeholder**	**Area of Interest**
Pastoral stations	Yarraloola Pastoral Station Red Hill Pastoral Stations	• Land management (weeds, feral animals, fire). • Vehicle movements.
Community Groups	Town of Onslow Community	• Local development • Job creation • Potential benefits, impacts and risk-mitigation • Community funding / collaboration activities
	Environmental Interest Groups	• Fauna rescue • Environmental surveys, significance of data and impact assessments
	Tour Operators	• Potential benefits and impacts • Proposal updates

7.3 Ongoing engagement and access agreements

Community and stakeholder engagement is continuing to assist with the management of stakeholder communication and interaction as the Project progresses through regulatory approvals and prepares for implementation.

Access agreements have been entered into with the following parties, demonstrating the stakeholder engagement developments.

7.3.1 Rio Tinto

An access agreement has been entered into between CZR and Robe River Mining Co. Pty Ltd (operated by Rio Tinto), covering overlapping infrastructure tenements (L08/296 and 297) on Robe River Mining Co. Pty Ltd exploration licences (E08/1148 and 1196).

7.3.2 Pastoralists

The Robe Mesa project is located on Yarraloola Pastoral Lease (N49500), held by Robe River Mining Co. Pty Ltd, and the De Grey-Mullewa Stock Route (excised from Yarraloola Station).

Yarraloola Station is operated through a sub-lease by Leanne Corker, John (Digby) Corker, and Dylan Corker (sub-lessees). The sub-lessees, who hold Red Hill Station to the south and south east of Yarraloola, undertake pastoral operations on Yarraloola Station, and advise that the cattle on Yarraloola and Red Hill are managed as one herd. They run between 400 to 600 cows and up to 450 weaners on the Yarraloola land south east of the NWCH (which is fenced), and south of the Mesa A-Mesa F mines operated by Rio Tinto.

A land access agreement between CZR and Yarraloola Station has been entered into.

7.3.3 Mineral Resources Limited

CZR has entered into the following access agreements with subsidiaries of Mineral Resources Limited:

- Cape Preston Logistics Pty Ltd and Buckland Minerals Transport Pty Ltd in respect of CZR tenements L08/295, L08/296, L08/297, L08/302, L08/303, L08/304, L08/317 and L08/322 overlapping L08/100, L08/101 and L08/120
- Red Hill Iron Ore Joint Venture and Red Hill Minerals Ltd (not a subsidiary of Mineral Resources Limited), in respect of CZR tenements L08/295, L08/296, L08/297, L08/302, L08/304 and L08/322 overlapping E08/1289

7.3.4 API Management

An access agreement has been entered into between CZR and API Management Pty Ltd, covering overlapping infrastructure tenements (L08/295, L08/296, L08/302, L08/303 and L08/304) on API Management Pty Ltd exploration licences (E08/2858 and E08/2766).

7.4 Consultation with RRK on Cultural Heritage of the Robe Mesa Project area

Consultation and negotiations about the RRK Cultural heritage were undertaken within the context of the agreement making process for the Robe Mesa Agreement (the Agreement) related to the native title agreement.

In addition to the on-ground cultural heritage surveys undertaken from 2014 onward listed in Mining Proposal Section 8.6.2 Robe Mesa History and engagement with Traditional Owners, Robe River Kuruma people have participated in cultural heritage/Social Impact Assessment consultations that were based on the information provided by the Robe Mesa Project by CZR Mining.

These consultations comprised participatory workshops with the Robe River Kuruma apical family groups and included the provision of information and discussion about, among other things, the potential social, cultural, environmental, and economic impacts of the Robe Mesa Project. The impact assessment methodology and risk management-based approach used was consistent with international best practice for impact assessment and the application of the principles of Free, Prior and Informed Consent.

The consultations and cultural information collected is subject to confidentiality provisions contend within the Agreement that includes but is not limited to Robe River Kuruma law and culture, traditional structures, traditional laws and decision-making processes, and the nature and location of Aboriginal cultural and heritage sites. Culturally Confidential Information must not be disclosed publicly without the express written permission of the Robe River Kuruma PBC and remains the intellectual property of that person or persons, or the Robe River Kuruma People as a whole or the Current PBC, as the case may be.

Further information about the consultations held and future communications and consultation if required can be requested from the Robe River Kuruma PBC.

Aboriginal cultural heritage information has been recorded over the area of the tenements for more than 30 years. CZR has reviewed over forty historic survey reports identifying the fifty (50) Aboriginal sites recorded on the Aboriginal Heritage Inquiry System (AHIS) (30 Registered sites and 20 Other Heritage Places) including water sources, burials, mythological, ceremonial sites, artefact scatters and camping sites.

The frequency of cultural heritage surveys and abundant cultural information on the public record means that there is a very low probability that unrecorded significant Aboriginal sites exist within the area of the tenements, meaning CZR has high confidence in its knowledge of the Aboriginal heritage site profile of the Project area.

Archaeological sites (scar trees, rock shelters and artefact scatters) and Ethnographic sites have been identified. Of particular cultural value is the Robe Pools area and Northern aspects of Robe Mesa, which have been deemed as No-Go Areas. Cultural Mapping of the area has also been undertaken by RRK. As a result of the various surveys RRK have provided No-Go area determinations and given full heritage approval for ground disturbance clearance in areas surveyed.

The implications of this heritage work is that a good relationship has been established with RRK, resulting in the Heritage Agreement being signed on 21 Dec 2022 and ongoing development of the CHMP. The RRK CHMP Application Area for the Robe Mesa Project does not include any part of a protected area. CZR's access agreements and ongoing cultural heritage engagement with RRK provide CZR with a high degree of confidence that ongoing access, exploration, and project development will continue to be achieved.

The RRK 2023 Annual report Robe River Kuruma 2022/2023 Annual Report – RRKAC states on page 10:

> "CZR Agreement Signing
>
> In December 2022, RRKAC signed the CZR Agreement following the resolution to endorse this Agreement at a meeting of common law holders on 18 November 2022 in relation to the Robe Mesa Project.
> This Agreement sets in place a new benchmark in agreement-making with several positive commitments including: no mining below the water table; agreed pit outline; limits on water; and the development of a Cultural Heritage Management Plan and Environmental Protocol.
> Subject to a Final Investment Decision in Q2 2024, construction may begin in the middle of 2024 with first ore in Q2 2025."

In the 22 Dec 2022 ASX Announcement Pivotal Mining Agreement Signed with Native Title Holders, Agreement with Robe River Kuruma Aboriginal Corporation paves way for the grant of Mining Leases at Robe Mesa

> "RRKAC CEO Anthony Galante said, "For RRKAC this is a new benchmark in how agreements with mining companies are achieved. We have managed to secure an Agreement that provides economic and social benefits while carefully managing cultural and environmental considerations. We look forward to the ongoing partnership with CZR and congratulate them for their respectful approach to negotiations."

The 21 Dec 2022 Heritage Agreement with RRK outlines Decommissioning of the Robe Mesa Project and Handover Rights to RRKAC.

8. Baseline Environmental Data

8.1 Climate

8.1.1 Climatic Zone

The Proposal is located within an arid climate that is defined by two distinct seasons characterised by hot to very hot summer periods generally from November to April and mild to hot winter periods from May to October. The area is subject to tropical cyclones which generally occur between January and June and can result in over 200 mm of rainfall in one day. Cyclones normally weaken to a rain-bearing depression after crossing the Western Australian coastline and are a strong influence on the distribution of rainfall across the Pilbara region, often resulting in flooding (Bureau of Meteorology (**BOM**), 2022

8.1.2 Temperature

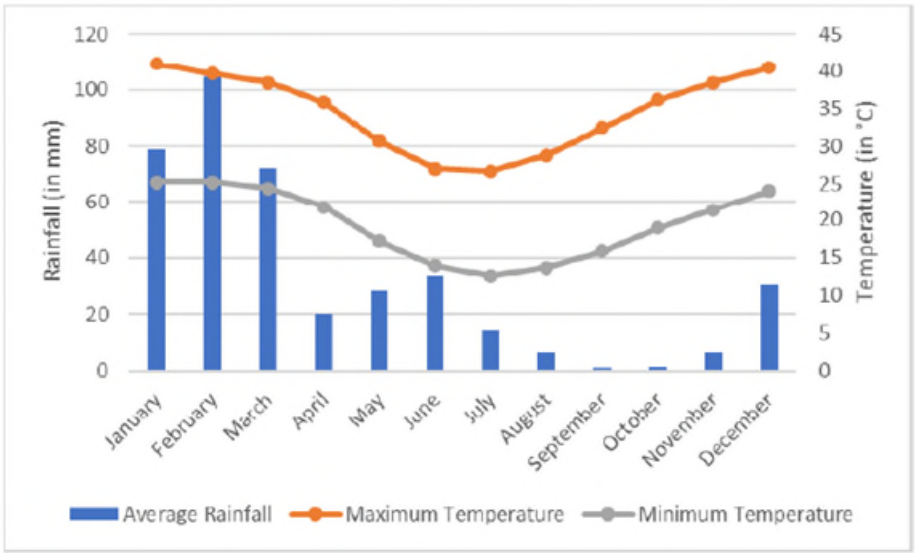
The BOM weather station at the Pannawonica townsite (Site Number 005069), located northeast of the Proposal Area, is the nearest weather station to the Proposal. Based on data from this weather station, it is understood that January is the hottest month with a mean maximum temperature of 41.0°C and temperatures up to 48°C recorded in 2003 (BoM 2022). July is the coldest month with a mean minimum temperature of 12.6°C (**Figure 8.1.1**) with temperatures of 5°C recorded in 1973 (BoM 2022).

8.1.3 Rainfall

Summer rainfall generally results from cyclonic activity moving south from northern Western Australia in January, February, and March. The annual rainfall recorded at Pannawonica is 404.1 mm with the highest average monthly rainfall occurring in February at 104.5 mm, this has been adopted as average for the Proposal Area (BoM 2022). The driest part of the year is experienced from August to November. The total rainfall over this period averages 16.6 mm, and the lowest rainfall occurs in September, with an average rainfall of 1.3 mm (**Figure 8.1.1**).

Rainfall Intensity, Frequency and Duration is described in **Table 8.1.1.** A 1 in 100-year 72-hour rainfall event is 358.6 mm and a one in 100-year 24-hour event is 280.8 mm (BoM 2012).

Figure 8.1.1 : Weather statistics for Pannawonica Weather Station (Site No 005069)



8.1.4 Historical Flooding and Maximum Rainfall Events

The most significant daily rainfall event recorded by the BOM Pannawonica weather station (Site No 005069) occurred in February 2009, with 244.6 mm recorded in a 24-hour period (BoM 2022). The largest annual rainfall at that station was recorded in 1995, with a total of 443.8 mm.

Table 8.1.1 : Rainfall Intensity, Frequency and Duration for the Proposal Area

Duration	Average Recurrence Intervals (Years)						
Event Duration	1	2	5	10	20	50	100
5 minutes	6.2	8.2	11.3	13.3	15.8	19.3	21.9
10 minutes	9.4	12.5	17.5	20.7	24.7	30.0	34.3
1 hour	22.2	29.8	43.2	51.8	62.8	77.9	89.9
12 hours	37.7	52.9	86.9	111.6	142.8	188.4	226.8
24 hours	46.6	65.5	108.0	138.7	177.4	234.0	280.8
48 hours	58.6	82.6	133.0	169.0	214.4	279.4	334.1
72 hours	63.8	89.3	143.3	181.4	230.4	300.2	358.6

8.1.5 Seasonal and Long-Term Climatic Trends

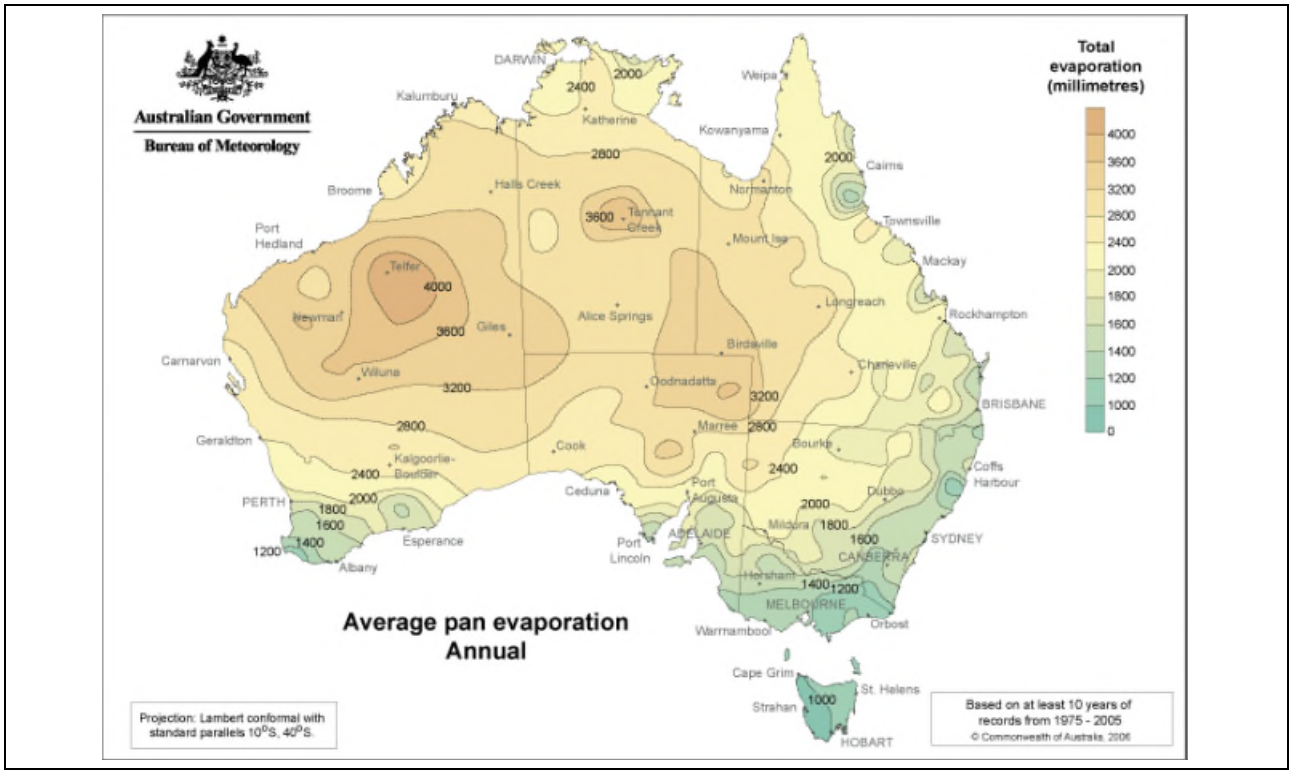
Climate projections for the Pilbara under various emissions scenarios show (CSIRO and BOM, 2021):

- There is very high confidence in continued substantial increases in projected mean, maximum and minimum temperatures. For the near future (2030), the annually averaged warming across all emission scenarios is projected to be ~0.6 to 1.5 °C above the climate of 1986–2005. By late in the century (2090), for a high emission scenario, the projected range of warming is 3.1 to 5.6°C and, under an intermediate scenario, the projected warming is 1.5 to 3.1 C;
- Extreme temperatures are projected to increase at a similar rate to mean temperature, with a substantial increase in the temperature reached on hot days, the frequency of hot days and the duration of warm spells;
- Fewer, but more intense tropical cyclones are predicted (medium confidence);
- There is high confidence that potential evapotranspiration will increase in all seasons;
- In the near future (2030) natural variability in rainfall is projected to predominate over trends due to greenhouse gas emissions. Changes to rainfall are possible, but the direction of change cannot be confidently projected given the spread of model results;
- A future increase in the intensity of extreme rainfall events is predicted with high confidence, although the magnitude of the increases cannot be confidently projected; and
- Time spent in drought is projected, with medium confidence, to increase over the course of the century.

8.1.6 Evaporation

The Australian average annual evaporation map indicates that the area has an annual evaporation rate of 3,200 mm (**Figure 8.1.2**). Based on an average rainfall of 404.1 mm for Pannawonica, the average annual evaporation rate exceeds rainfall by a factor of seven.

Figure 8.1.2 : Average Annual Evaporation

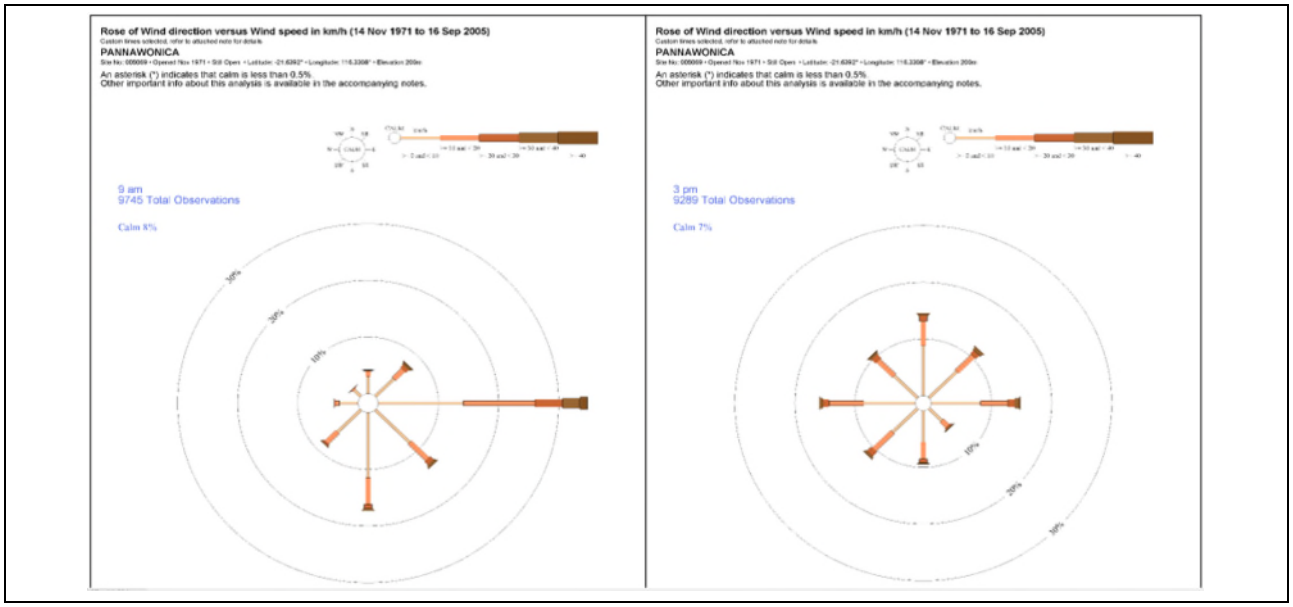


Source: BOM (2021)

8.1.7 Wind

Winds for the Pannawonica weather station (Site Number 005069) for 9 am are predominantly from the east to the south with speeds up to and greater than 40 km/h (**Figure 8.1.3**) (BoM 2022). Winds at 3 pm are more distributed from most directions with an increase in westerlies, northerlies and easterly winds being more dominant (**Figure 8.1.3**).

Figure 8.1.3 : Wind Speed and Direction (Pannawonica Weather Station - Site No 005069)



8.1.8 Implications for Risk Assessment, Treatments and Environmental Outcomes

The implications for the Proposal resultant of its geographic and climatic location, including the rainfall and evaporative characteristics of the climate include:

- With evaporation rates significantly higher than rainfall and variable wind, the Proposal can experience conditions that require dust suppression measures to ensure potential impacts from the Proposals operations remain low.
- It is recognised that CSIRO has recommended that impact assessment consider the risk of both a drier and wetter climate. Changes in temperature and other aspects related to the weather in the region in the near future (2030) have been identified with medium to very high confidence (depending on the parameter under consideration). However, natural variability in rainfall is projected to predominate over trends due to greenhouse gas emissions in the near future (2030).
- Regional climatic conditions will inform the scheduling and implementation of rehabilitation works, including timing of topsoil handling and seeding.

Mitigation and management measures for the above risks will be managed through the Environmental Management System (EMS) and discussed in Section 9.

8.2 Landscape

8.2.1 Regional Landscape

The Hamersley Province is located approximately 1,000 km north of Perth in the north-west of WA and covers approximately 80,000 km2. The Proposal is located along the western margin of the Hamersley Ranges, which are some of the highest ranges in Western Australia.

8.2.2 Bioregion

The Interim Biogeographic Regionalisation for Australia (**IBRA**) divides the Australian continent into 85 bioregions and then into 405 subregions according to the major geomorphic and biological features in each bioregion (Environment Australia 2000). The Proposal is located in the Hamersley subregion (PIL03) of the Pilbara bioregion, with the main characteristics outlined in **Table 8.2.1**.

The Hamersley subregion covers an area of 6,215,092 ha and is characterised by mountainous areas of Proterozoic sedimentary ranges and plateaux, dissected by gorges (basalt, shale, and dolerite). Mulga low woodland over bunch grasses on fine textured soils in valley floors, and Eucalyptus leucophloia over Triodia brizoides on skeletal soils of the ranges. The climate of this subregion is described by Kendrik (2001) as semidesert tropical and averaging 300 mm of rainfall per annum. Rainfall is usually in summer cyclonic or thunderstorm events, but winter rain is not uncommon (Kendrick 2001).

The Pilbara bioregion is a major centre for biodiversity within Western Australia. In recognition of this high species diversity and the high levels of endemism in the region, the Hamersley subregion is considered one of the 15 national biodiversity hotspots in Australia. A description of the Pilbara region and the Hamersley subregion and their extent in the Disturbance envelope is provided in **Table 8.2.2**.

This appears to be related to the diversity of geological, altitudinal, and climatic elements in the region, as well as being a function of its location in a transitional zone between the floras of the Eyrean (central desert) and southern Torresian (tropical) bioclimatic regions (see for example van Leeuwen and Bromilow (2002) for a detailed discussion of the significance of the Hamersley Range).

Table 8.2.1 : Characteristics of the IBRA Subregion – Pilbara 3 Hamersley	
Characteristic	**Descriptions and biodiversity values**
Dominant land uses	• Grazing • UCL and Crown Reserves • Native pastures • Mining • Conservation • Urban
Wetlands of national and subregional significance	• Karijini Gorges (national) • Weeli Wolli Spring (subregional) • Palm Spring, Duck Creek (subregional) • Mount Bruce coolibah claypan (subregional) • Springs and pools of the Robe River (subregional)
Riparian zone vegetation	• Fortescue and Robe Rivers

According to the 2019 Statewide Vegetation Statistics (Government of WA 2019), the Hamersley (PIL3) subregion is 5,608,386 ha in size and represents approximately 32% of the Pilbara region. The Hamersley subregion is described by Kendrick (2001) as "a mountainous area of Proterozoic sedimentary ranges and plateaux, dissected by gorges (basalt, shale, and dolerite). Mulga low woodland over bunch grasses on fine textured soils in valley floors and *Eucalyptus leucophloia* over *Triodia brizoides* on skeletal soils of the ranges. Drainage into either the Fortescue (to the north), the Ashburton to the south, or the Robe to the west".

Table 8.2.2 : Description of the IBRA region and subregion within the Robe Mesa Project					
Description	**Current Extent***	**Extent in Disturbance envelope**		**Extent in proposed Disturbance footprint**	
		ha	**%**	**ha**	**%**
PIL Pilbara Bioregion (PIL)					
The Pilbara bioregion is characterised by vast coastal plains and inland mountain ranges with cliffs and deep gorges. Vegetation is predominantly mulga low woodlands or snappy gum over bunch and hummock grasses (Bastin and ACRIS 2008).	17,731,764.8 ha (99.6% remaining)	902	0.005	270	0.002
Hamersley Subregion (PIL03)					
Mountainous area of Proterozoic sedimentary ranges and plateaus, dissected by gorges (basalt, shale, and dolerite). Mulga low woodland over bunch grasses on fine textured soils in valley floors and *Eucalyptus leucophloia* over *Triodia brizoides* on skeletal soils of the ranges (Kendrick 2003).	5,608,386.0 ha (99.5% remaining)	902	0.02	270	0.005

*Source: Government of WA (2019)

8.2.3 Land Systems

Land systems are composed of repeating patterns of topography, soils, and vegetation, which are described as a series of land units (Christian and Stewart 1953). A total of 105 land systems have been identified and

mapped in the Pilbara bioregion by the then Department of Agriculture. Land systems mapping covering the survey area was prepared by van Vreeswyk et al. (2004).

A total of nine land systems are mapped within the survey area, all of which are well represented in the region, with their total mapped extents ranging from 15,493 ha (Sherlock) to 281,592 ha (Stuart). As **Table 8.2.3** shows, the Disturbance envelope and Disturbance footprint intersect only very small portions of the extent of each land system in the Pilbara bioregion (**Figure 8.2.1).**

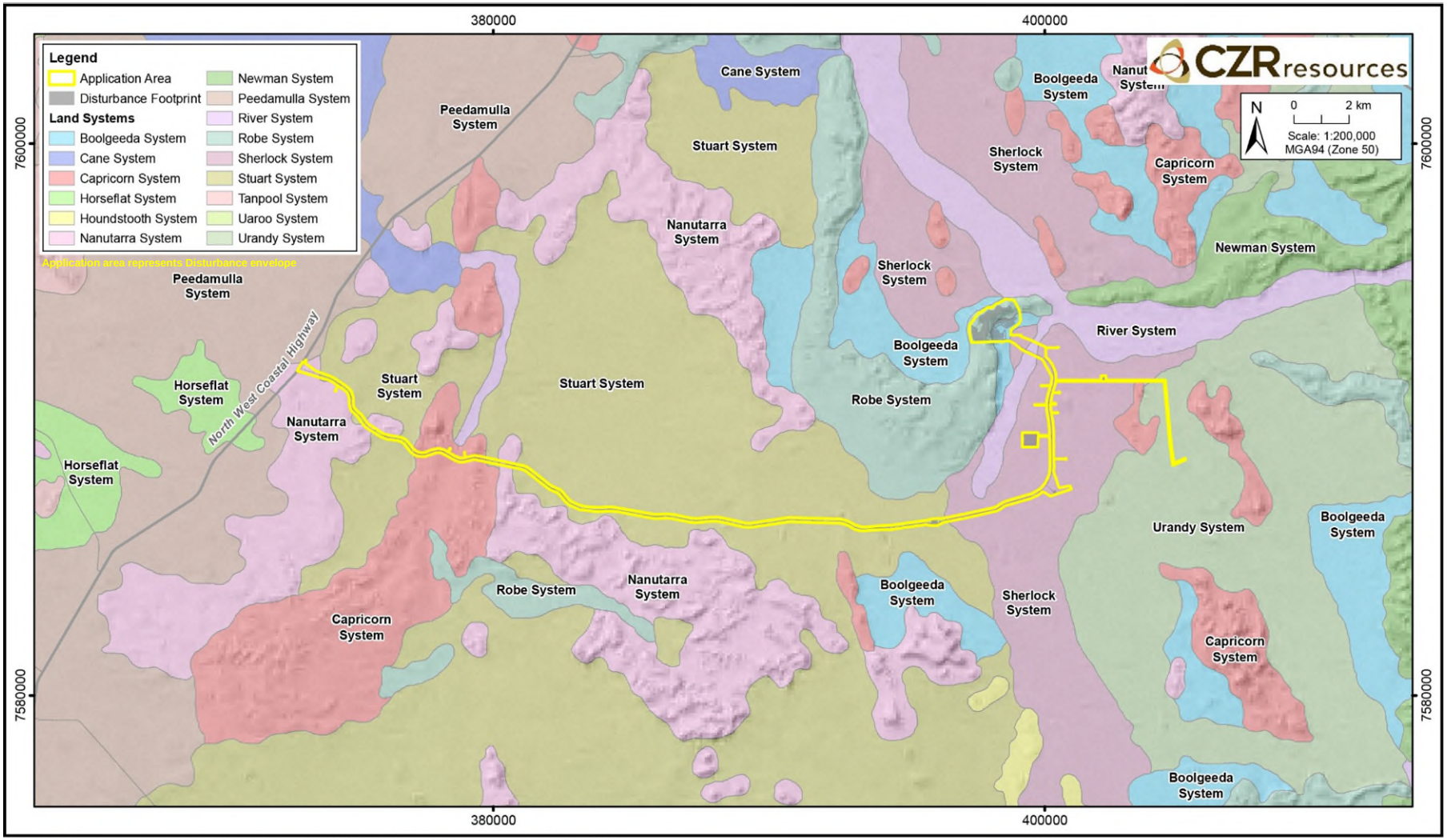
Table 8.2.3 : Land Systems of the Robe Mesa Project

Land System Unit and Description	Land System Extent	Extent of Disturbance envelope (ha). Proportion of surveyed extent (%)		Extent of Disturbance footprint (ha). Proportion of surveyed extent (%)	
	ha	ha	%	ha	%
202Pe Peedamulla: Gravelly plains supporting hard spinifex grasslands and minor snakewood shrublands.	59,201	0.1	0.0002	0.1	0.0001
296Bg Boolgeeda: Stony lower slopes and plains below hill systems supporting hard and soft spinifex grasslands or mulga shrublands.	40,259	66.3	0.2	41.1	0.1
296Cp Capricorn: Rugged sandstone hills, ridges, stony footslopes and interfluves supporting low acacia shrublands or hard spinifex grasslands with scattered shrubs.	117,459	42.5	0.04	9.9	0.008
296Nn Nanutarra: Low mesas and hills of sedimentary rocks supporting soft and hard spinifex shrubby grasslands.	77,493	48.3	0.1	7.0	0.009
296Ri River: Narrow, seasonally active flood plains and major river channels supporting tall shrublands or woodlands of acacias and fringing communities of eucalypts with tussock grasses/spinifex.	16,403	16.7	0.1	0.9	0.006
296Ro Robe: Low plateaux, mesas and buttes of limonite supporting soft spinifex and occasionally hard spinifex grasslands.	31,872	140.9	0.4	73.0	0.2
296Sk Sherlock: Stony alluvial plains supporting snakewood shrublands with patchy tussock grasses and spinifex grasslands	15,493	257.6	1.7	65.9	0.4
296St Stuart: Gently undulating stony plains supporting hard and soft spinifex grasslands and snakewood shrublands.	281,592	307.9	0.1	67.2	0.02
296Uy Urandy: Stony plains, alluvial plains and drainage lines supporting shrubby soft spinifex grasslands.	29,749	22.1	0.1	4.4	0.01

8.2.4 Implications for Risk Assessment, Treatments and Environmental Outcomes

There are no specific risks related to landscape. Soils and growth media are discussed in Section 8.3.1.

Figure 8.2.1: Land Systems of the Robe Mesa Project



Drawn: CAD Resources (08 9246 3242), Date: Jun 2023, CAD Ref: a2967_F001_04, Rev: A ~ Land Sys: DPIRD-064

8.3 Materials Classification

8.3.1 Soils

Five broad soil types are found across the Disturbance envelope, as per Northcote *et al.* (1960) (**Table 8.3.1** and **Figure 8.3.1**). The most abundant across the region is Oc66, which comprise mainly hard alkaline red soils on pediplains and plains, with small areas associated with occasional patches of calcrete. Soil types Oc65 and Oc66 are the most abundant of the disturbance envelope, although their extent in the envelope represents a very small portion of their total extent (0.74% and 0.03% respectively). Soil type MY1 represents the largest area of disturbance footprint of all the soil types mapped.

- B27 - Low terrace: Associated with mainstream channels: chief soils are loose sands (Uc1.22) with some (Um5.11) soils on patches of calcrete (kunkar).
- MY1 - Gently undulating plateau: The boundary of this unit is frequently formed by breakaways, but it may at times merge beneath the adjacent plain. These areas are capped by the Robe pisolite iron ore formation. The chief soils are gravelly acid red earths (KS-Gn2.11) with (Dr2.33) soils on the pediments.
- Oc65 - Low stony hills and steeply dissected pediments: Found in areas of fine-grained sandstone, shale, and dolomite. There may be small areas of ferruginous duricrust and Robe pisolite as a capping. The soils are often shallow and stony: chief soils are hard alkaline red soils (Dr2.33) with some (Uc5.11) soils. (Um5.11) soils may occur on calcrete (kunkar) in the narrow valley plains and on exposures of calcareous rocks. (KS-Gn2.11) soils occur on the small area of ferruginous duricrust and Robe pisolite.
- Oc66 – Pediplains: Gently undulating pediplains extending out from breakaways capped by Robe pisolite deposits and other related formations. There may be a few small flat-topped residuals rising above the pediplains: chief soils are hard alkaline red soils (Dr2.33). Small areas of (Um5.11) soils may be associated with occasional patches of calcrete (kunkar). Minor soil occurrences include (Uf6.71), (Ug5.37), (Gn2.13) and stony (Gn2.12) soils.
- Oc67 - Plains: Dominant soils are hard alkaline red soils (Dr2.33). Associated are extensive areas of (Um5.52) soils with (Ug5.38) soils in central landscape positions. Small areas of (Gn2.12) soils also occur as well as (Um5.11) on calcrete (kunkar).

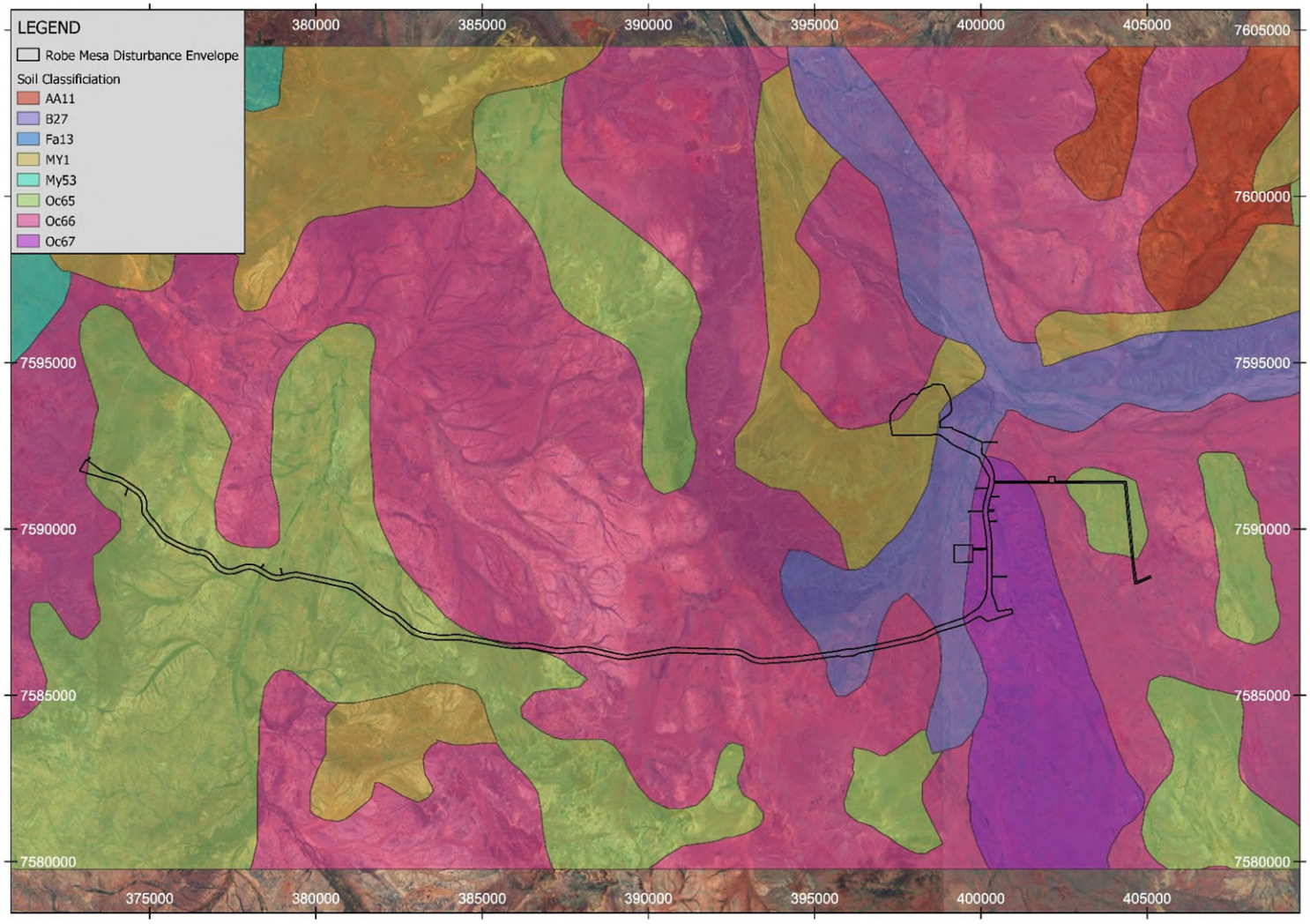
Table 8.3.1 : Soil types of the Robe Mesa Project

Soil type (Northcote et al. 1960)	Land System survey extent	Extent of Disturbance envelope (ha). Proportion of surveyed extent (%)		Extent of Disturbance footprint (ha). Proportion of surveyed extent (%)	
	ha	ha	%	ha	%
B27	33,355.5	140.7	0.42	40.0	0.12
MY1	21,440.9	165.1	0.77	99.6	0.46
Oc65	33,580.6	246.9	0.74	51.6	0.15
Oc66	771,745.4	219.2	0.03	53.3	0.01
Oc67	21,427.6	130.9	0.61	25.1	0.12

Topsoil from landforms associated with 'valley floor' and 'low hills / ridges' (i.e. Oc65, Oc66, Oc67) may be salvaged to a depth of 200mm in areas of disturbance, for use as a rehabilitation resource.

Topsoils from the 'ridgelines / rocky outcrops' (i.e. MY1) are also suitable for salvage and use as a rehabilitation resource, however, due to accessibility and the prevalence of outcropping rock, the salvage of these topsoils is likely to be limited to opportunistic stripping in accessible areas where topsoil is present. Salvage of topsoils from these areas will therefore be maximised.

Figure 8.3.1 : Soil types of the Robe Mesa Project



8.3.2 Subsurface Materials and Mining Waste

The volume of waste produced in the Robe Mesa Project will represent 19.3 Mt, all of which will be returned to the mine void on completion of the project.

Characterisation of waste material from the Project by Graeme Campbell and Associates (GCA) (2022, **Appendix 8-01**) found that all the samples tested (1,218 samples) classified as Non-Acid Forming (NAF) and circum-neutral (pH 6-9) with low to moderate contents of soluble-salts.

Overall, the waste material is considered inert with no fibrous or potentially acid forming material present.

All samples tested classify as Non-Acid Forming (NAF), due to 'negligible-sulphides' (Total-S< 0.1 %) in a groundmass devoid of carbonates. All mining-streams (Weathered-Surface-Zone, USI-waste, MSI-waste and Low-Grade ores) to be produced during the Project are inert, reflecting both the geology and age of the lithology units.

Geochemically, all mining-streams (Weathered-Surface-Zone, USI-waste, MSI-waste and LG ores) produced during the Robe Mesa Project are inert and may be handled and stored without restriction, and pose no concerns for impaired water-quality, and/or revegetation, over the longer-term (GCA 2022).

Analysis of waste material also identified the weather-surface zone, a waste unit with a shallow geologic-profile and a cobbly/blocky nature, as an important resource for physical-stabilisation (e.g., cladding / armouring) and rehabilitation applications.

Clay surface chemistry

Selected samples were tested for effective-Cation-Exchange-Capacity (eCEC), and tendency for dispersion of 'soil-colloids' when subjected to osmotic stress, as per Emerson dispersion Testing (**Table 8.3.2** :).

The eCEC values were typically within the range 3.4-8.1 cmol [+]/kg, with one sample (RM_WC09, USI) recording an eCEC value of 13 cmol [+]/kg, reflective of it containing smectite (Table 4 of GCA 2022, Appendix 8-01). Although this sample contained 'minor-smectite', it also contained 'accessory-calcite' such that the ESP was low (6 %) with Exchangeable-Ca forms predominating on the clay-exchange complex. Occurrence of 'clay-tactoids', due to Ca-occupancy of smectite-lamellae-exchange sites results in clay aggregates that are stable when wetted for this sample (GCA 2022).

When subjected to Emerson dispersion testing, the 'fine-earth' (-2 mm) fractions exhibited a range in tendency for 'soil-colloids' to disperse. Two of the four Weathered-Surface-Zone samples exhibited dispersion. However, in practice such dispersion tendency will be offset by the modest 'fine-earth' content, and the cobbly / blocky nature, of this mining-stream.

Erosion control and revegetation

GCA (2022) concluded that the USI-waste and MSI-waste streams, and LG-ores, are expected to be 'fines-rich' (i.e. quite "earthy"). These mining-streams therefore need to be managed appropriately to constrain erosion rates. GCA (2022) also noted that, the cobbly / blocky nature of the Weathered-Surface-Zone means that this mining-stream stands to be an important Project resource for a construction, physical-stabilisation (e.g. cladding / armouring), and rehabilitation applications.

Together with topsoil that has been salvaged during pre-strip operations, and stockpiled for later redeployment, the Weathered-Surface-Zone is the mining-stream of choice for use in site-wide rehabilitation works.

Due to the geochemical inertness of the various lithotypes, controlling erosion of the "earthy" variants is the key "environmental-demand" for mining-stream management for the Project during operations (e.g. LG-ore

stockpile outside the pit). However, since any mining-stream remaining outside the pit is to be returned to the pit (inside the mesa) at site decommissioning, any interim erosion-control measures implemented during operations become redundant for the longer-term.

Table 8.3.2 : Clay-Surface Chemistry and Emerson-Dispersion Testing of Mine-Waste Samples (Source: GCA 2022)

Sample ID	Lithology	eCEC (cmol [+]/kg)	ESP (%) (Na)	EMP (%) (Mg)	ECP (%) (Ca)	EPP (%) (K)	Emerson Class Number
RM_BULK_01	bulk-grab' sample (0-1 m nominal) from Weathered-Surface-Zone	4.0	4	32	58	6	5
RM_BULK_02	bulk-grab' sample (0-1 m nominal) from Weathered-Surface-Zone	3.4	14	37	45	4	3a
RM_BULK_03		3.0	5	39	51	6	3a
RM_BULK_04		4.0	13	34	48	5	5
RM_WC09	Upper-Sandy-Ironstone, USI	13	6	30	61	<1	4
RM_WC01	Middle-Sandy-Ironstone, MSI	5.8	15	39	45	<1	3b
RM_WC18	Middle-Sandy-Ironstone, MSI	5.8	15	30	53	2	3a
RM_WC05	Lower-Silty-Clay, LSC	8.1	8	49	42	2	3b

Notes: eCEC = Effective-Cation-Exchange Capacity; ESP = Exchangeable-Sodium Percentage; EMP = Exchangeable-Magnesium Percentage; ECP = Exchangeable-Calcium Percentage; EPP = Exchangeable-Potassium Percentage.
Determination of soil-exchange characteristics, and Emerson Dispersion Testing, conducted on 'fine-earth' (-2 mm) fractions.
Emerson Class Number:

- 3a 'fine-earth' fraction readily liberates 'soil-colloids' (clays/sesquioxides') when subjected to osmostic-stress upon inundation from rainfall (i.e. strong dispersion tendency)
- 3b 'fine-earth' fraction exhibits a weak dispersion tendency
- 4 calcite / gypsum presence inhibiting dispersion of 'soil-colloids'
- 5 though 'fine-earth' fraction does not disperse when subjected to 'osmotic-stress' from soaking in deionised-water, 'short-range' attractive forces between particle-surfaces
- insufficient for flocculation (i.e. following vigorous agitation, soil-suspension remains dispersed).

8.3.3 Implications for Risk Assessment, Treatments and Environmental Outcomes

The finer material is likely to be susceptible to increased dispersion with disturbance with the exception of one sample out of eight. However, there was only a small amount of finer material compared with the mostly cobbly/blocky nature of most of the mine waste.

Weathered-surface zone material will be used for construction, physical stabilisation (cladding and armouring) and rehabilitation. Together with topsoil that has been salvaged, this material is preferred for rehabilitation purposes.

8.4 Biodiversity

8.4.1 Pre-European Vegetation

Broad-scale vegetation mapping for the locality has been prepared at the 1:1,000,000 scale based on the work of J.S. Beard for the Pilbara (Beard 1975a). The survey area includes four of Beard's vegetation associations (**Figure 8.4.1**, **Table 8.4.1**).

The haul road corridor and mine area are dominated by the Stuart Hills 583 association, which comprises sparse Kanji (*Acacia pyrifolia*) shrubs over hard spinifex (*Triodia basedowii* and *T. wiseana*) hummock grasslands.

Sparse Mulga (*Acacia aneura* complex) woodlands of the Stuart Hills 29 association dominate the Mine Infrastructure area.

Very small areas of the Disturbance envelope fall within the Stuart Hills 620 and Stuart Hills 93 associations, which both comprise hummock grasslands with scattered shrubs or mallee.

8.4.2 Vegetation

Information in this section is primarily based on the following supporting studies:

- RPS (2021). Detailed Flora and Vegetation Assessment. Robe Mesa and Robe East extension deposits (Appendix 8-2)
- Biota (2023a) Robe Mesa Project Detailed Flora and Vegetation Survey (Appendix 8-3)
- Biota (2023b). Robe Mesa Project: Haul Road Realignment and Associated Vegetation Extrapolation and Consolidation (Appendix 8-4)

The primary landforms found throughout the survey area comprised:

- Drainage lines, ranging in scale from major drainages supporting riparian Eucalyptus, Acacia and Melaleuca open forests and woodlands, through to minor drainages of scattered Corymbia hamersleyana over mixed Acacia shrubs and Triodia epactia;
- Hills and slopes with stony substrates supporting spinifex hummock grasslands; these usually had an overstorey of Acacia spp. and Senna spp. shrubs over a hummock grassland typically dominated by Triodia wiseana;
- Stony or gravelly plains, sometimes with clay soils, supporting Snakewood (Acacia xiphophylla) shrublands over tussock/annual grasses; and
- Stony or gravelly plains higher in the landscape supporting spinifex hummock grasslands with a sparse to open cover of shrubs and occasional Corymbia trees.

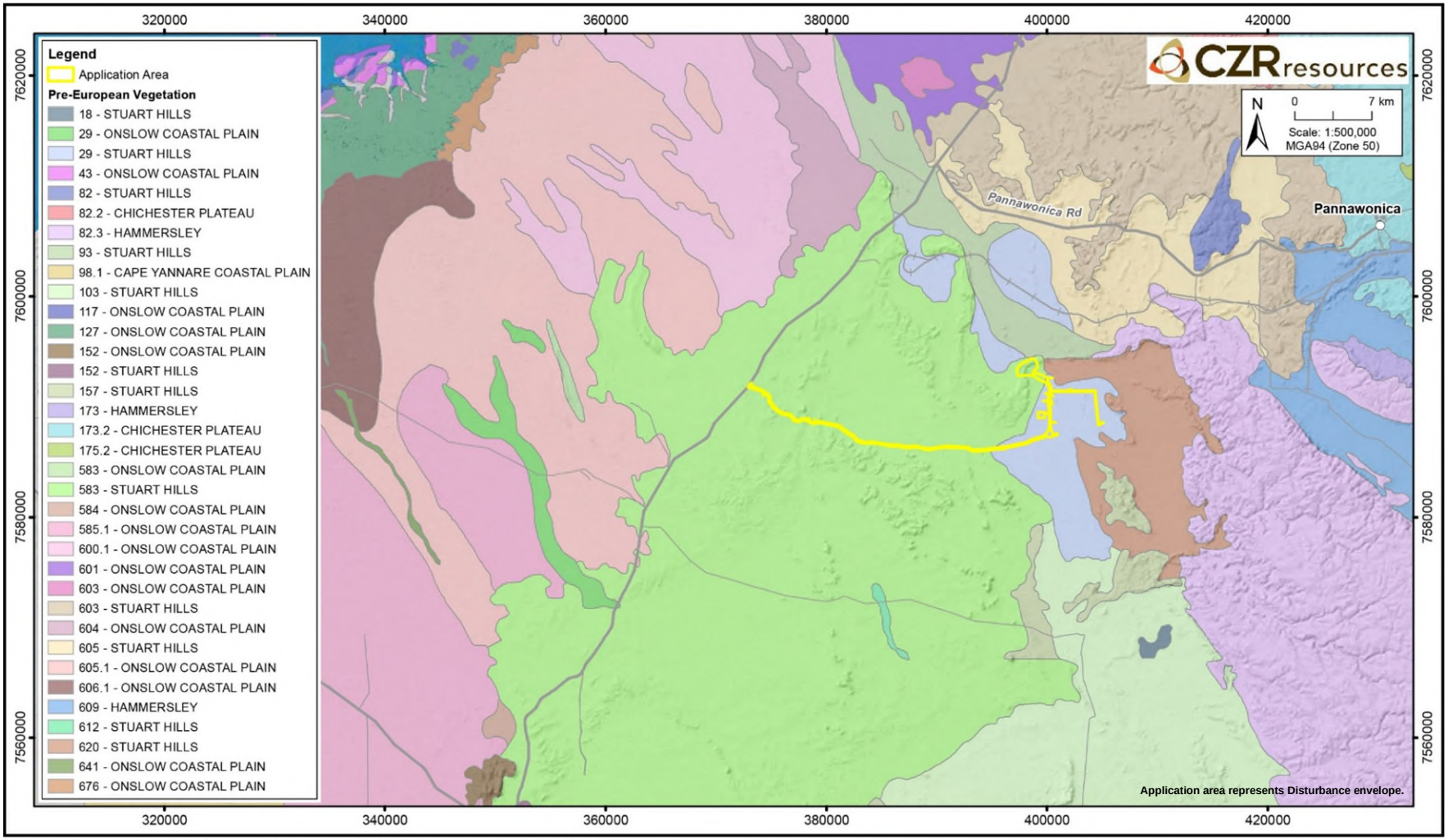
Photographs of the vegetation units of the Disturbance envelope are provided in **Figure 8.4.2** to **Figure 8.4.6**.

Based on the broad landforms, twenty-two (22) native vegetation units were mapped across the ~6,800 ha survey area, of which 18 were mapped within the Disturbance envelope and proposed Disturbance footprint. A summary of each mapped vegetation unit and any local significance is presented in **Table 8.4.2** and **Figure 8.4.7**.

Table 8.4.1 : Description of Beards vegetation associations within the Robe Mesa Project						
Description	**Current Extent in Bioregion PIL (ha) (% remaining) ***	**Current Extent in Subregion PIL03 (ha) (% remaining) ***	**Extent in Disturbance envelope and proportion of survey extent**		**Extent in Disturbance footprint and proportion of survey extent**	
			ha	**%**	**ha**	**%**
Stuart Hills 583						
Hummock grasslands, sparse shrub steppe; kanji and *Acacia bivenosa* over hard spinifex *Triodia basedowii* and T. *wiseana*.	243,111.7 ha (100% remaining)	240,724.2 ha (100% remaining)	628	0.3% of PIL bioregion 0.3% of PIL03 subregion	194	0.08% of PIL bioregion 0.08% of PIL03 subregion
Stuart Hills 29						
Sparse low woodland; mulga, discontinuous in scattered groups.	1,131,712.0 ha (99.9% remaining)	170,747.6 ha (99.2% remaining)	274	0.02% of PIL bioregion 0.2% of PIL03 subregion	76	0.007% of PIL bioregion 0.04% of PIL03 subregion
TOTAL			**902**	**0.07% of PIL bioregion 0.2% of PIL03 subregion**	**270**	**0.02% of PIL bioregion 0.07% of PIL03 subregion**

*Source: Government of WA (2019)

Figure 8.4.1 : Beard's Vegetation Associations of the Robe Mesa Project



Drawn: CAD Resources (08 9246 3242), Date: Jun 2023, CAD Ref: a2967_F001_10, Rev: A ~ PreEuroVeg: DPIRD-006

Table 8.4.2: Vegetation mapping of the Robe Mesa Project

Unit ID	Description	Significance - species associated with the vegetation unit	Survey extent (ha)	Disturbance envelope and proportion of survey extent		Disturbance footprint and proportion of survey extent	
				ha	%	ha	%
A1	*Acacia xiphophylla* tall shrubland over *Triodia epactia* open hummock grassland.	*Eragrostis crateriformis* (P3).	790.1	86.6	11.0	18.5	2.3
A2	*Acacia xiphophylla* tall shrubland over *Triodia wiseana* very open hummock grassland.	N/A	83.8	5.9	7.0	1.9	2.3
A3	Mixed *Acacia* spp. over *Triodia wiseana*.	N/A	686.0	60.1	8.8	8.9	1.3
A4	Mixed *Acacia* spp. over *Triodia epactia*.	*Eragrostis crateriformis* (P3).	1,388.3	155.9	11.2	37.8	2.7
A5	Mixed *Acacia* spp. over *Triodia longiceps*.	N/A	564.5	76.2	13.5	15.3	2.7
A6	*Acacia arida* over *Triodia wiseana*.	N/A	139.0	92.3	66.4	65.0	46.8
A7	*Acacia bivenosa* over *Triodia wiseana*.	N/A	209.5	23.8	11.4	13.8	6.6
A8	Asy.EcrTe - *Acacia synchronicia* Mid Open Shrubland over *Triodia epactia* Open Hummock Grassland (with intermittent clay pans with ephemeral Open Forbland and Open Tussock Grassland)	N/A	140.6	31.0	22.0	12.3	8.8
C1	*Corymbia hamersleyana* over mixed *Acacia* spp. over *Triodia epactia*.	*Eragrostis crateriformis* (P3).	548.8	78.5	14.3	30.1	5.5
C2	*Corymbia candida* subsp. *candida* over mixed *Acacia* spp. over *Triodia epactia*.	*Eragrostis crateriformis* (P3) and *Goodenia nuda* (P4)	593.3	78.8	13.3	20.7	3.5
C3	*Corymbia deserticola* subsp. *deserticola* over mixed *Acacia* spp. over *Triodia epactia*.	N/A	11.3	-	-	-	-
C4	*Corymbia zygophylla* over mixed *Acacia* spp. over *Triodia* spp.	N/A	162.4	23.7	14.6	7.0	4.3
C5	*Corymbia hamersleyana* over mixed *Acacia* spp. over *Triodia epactia*.	*Eragrostis crateriformis* (P3).	597.3	55.8	9.3	11.7	2.0
E1	*Eucalyptus leucophloia* subsp. *leucophloia* over mixed *Acacia* spp. over *Triodia wiseana*.	N/A	332.1	65.6	19.8	13.3	4.0
E2	*Eucalyptus victrix* (*Eucalyptus camaldulensis* subsp. *refulgens*) and *Melaleuca* spp. over mixed *Acacia* spp. over **Cenchrus* spp.	*Eragrostis crateriformis* (P3); and species associated with GDV.	179.2	13.9	7.8	1.5	0.8

Table 8.4.2: Vegetation mapping of the Robe Mesa Project							
Unit ID	**Description**	**Significance - species associated with the vegetation unit**	**Survey extent (ha)**	**Disturbance envelope and proportion of survey extent**		**Disturbance footprint and proportion of survey extent**	
				ha	**%**	**ha**	**%**
E3	El.Aa.TwTp - *Eucalyptus leucophloia* Low Isolated Clumps of Trees over *Acacia arida* Isolated Clumps of Shrubs over *Triodia wiseana* and *T. pisoliticola* Sparse Hummock Grassland	*Triodia pisoliticol*a (P3);	16.8	13.1	77.8	0.5	2.7
E4	El.AtuGr - *Eucalyptus leucophloia* Low Open Woodland over *Gossypium robinsonii* and *Acacia tumida* var. *pilbarensis* Tall Open Shrubland over *Acacia arida* Mid Open Shrubland Over *Triodia wiseana*, (*Triodia pisoliticola*) Open Hummock Grassland	*Triodia pisoliticola* (P3)	1.8	1.4	75.1	-	-
E5	AsyAsc.Te - *Eucalyptus victrix* and *Corymbia hamersleyana* Low Isolated Trees over *Acacia synchronicia* and *A. sclerosperma* subsp. *sclerosperma* Tall Sparse Shrubland over a mixed Low Open Shrubland / Forbland over *Triodia epactia* Sparse Hummock Grassland	Species associated with GDV	94.1	-	-	-	-
M1	MaEc.Mg.Cv - *Melaleuca argentea* and *Eucalyptus camaldulensis* subsp. *refulgens* Mid Open Forest over *Melaleuca glomerata* Tall Open Shrubland over *Cyperus vaginatus* Open Sedgeland	Species associated with GDV	0.3	-	-	-	-
S1	*Senna* spp. and *Acacia bivenosa* over *Triodia wiseana*.	N/A	100.6	5.3	5.3	1.1	1.1
T1	*Triodia longiceps* open hummock grassland.	N/A	159.2	19.3	12.1	2.6	1.6
T2	*Triodia epactia* hummock grassland.	N/A	44.0	8.0	18.2	2.6	6.0
D1	Cleared areas.	N/A	30.5	7.3	23.9	4.8	15.8

Figure 8.4.2 : Photographs of drainage line vegetation (units E2 and C5)

Figure 8.4.3 : Photographs of hills and slopes vegetation (units E1 and A6)

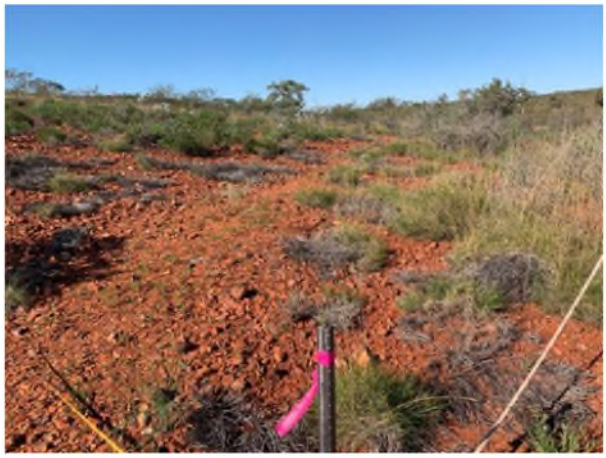
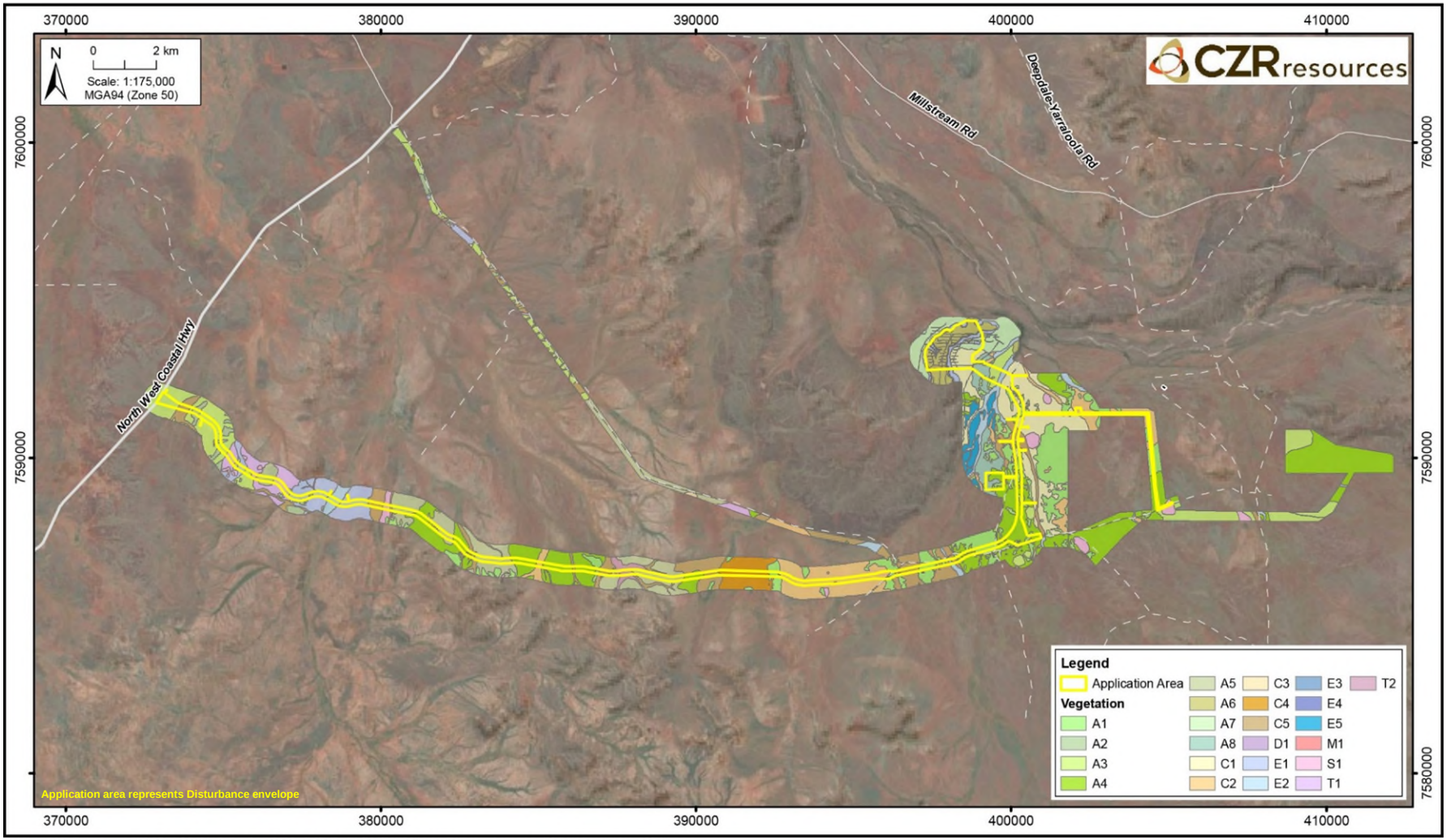


Figure 8.4.4 : Photographs of snakewood on plains vegetation (units A1 and A2)

Figure 8.4.5 : Photographs of stony plains vegetation (units T1 and T2)

Figure 8.4.6 : Photographs stony plains vegetation (units C2 and C3)

Figure 8.4.7 : Vegetation mapping of the Robe Mesa Project



Drawn: CAD Resources (08 9246 3242), Date: Jun 2023, CAD Ref: a2967_F001_11, Rev: A ~ Imagery: ESRI, Maxar (Oct 2021)

8.4.2.1 Conservation Significant Vegetation

Only two Threatened Ecological Communities (TECs) are listed for the Pilbara: the "Themeda grasslands on cracking clays (Hamersley Station, Pilbara)" and the "Ethel Gorge aquifer stygobiont community". Neither of these occur within the locality and do not occur within the Disturbance envelope.

Forty-three Priority Ecological Communities (PECs) are listed for the Pilbara bioregion (DBCA 2022), with the management buffer of one vegetation-related PEC intersecting the Disturbance envelope (**Figure 8.4.8**):

> The Priority 3 "*Triodia pisoliticola* (previously *Triodia* sp. Robe River) assemblages of mesas of the West Pilbara" PEC intersects the EAA. "This community is typically restricted to mesas and cordillo landforms where the plant assemblages are dominated by or contain *Triodia pisoliticola* and are indicative of inverted landscapes; that is, where *Triodia pisoliticola* occurs in combination with species that are considered 'out-of-context' from their normal habitat. The community is a combination of *Triodia pisoliticola* with *Acacia pruinocarpa*, *A. citrinoviridis* on slopes or peaks of mesas. These two Acacias are generally found associated with Pilbara creeklines and their occurrence is probably indicative of the genesis of the mesa surfaces in wetlands, then erosion of the landscape and 'inversion of the landscape' such that the mesa slopes and peaks that were previously low in the landscape become high points" (DBCA 2022).

8.4.2.2 Triodia pisoliticola PEC

CZR would like to acknowledge the enormous contribution by API Management (APIM) to the understanding of the *Triodia pisoliticola* PEC. The surveys and investigations that has been undertaken and commissioned by APIM on the *Triodia pisoliticola* PEC since 2010 have been instrumental in defining the PEC and understanding its ecology and distribution (in particular, work undertaken with Newland Environmental and Western Botanical).

Regional surveys

CZR consulted APIM, who manage the West Pilbara Iron Ore Project and has worked extensively on the *Triodia pisoliticola* PEC since 2010. APIM has undertaken a series of regional surveys to refine and map the *Triodia pisoliticola* PEC across the west Pilbara, as a requirement of APIMs Ministerial Statement 881 and 1027.

APIM regional mapping of *Triodia pisoliticola* PEC (using aerial and foot traversed surveys) included Mesa F, the landform associated with the Robe Mesa Project. APIMs regional mapping recorded no *Triodia pisoliticola* PEC within the Robe Mesa Project area. The closest confirmed *Triodia pisoliticola* PEC mapped during regional surveys was recorded approximately 3-4km south of the mine area (Newland Environmental 2021; Western Botanical 2015).

Regional surveys identified and mapped many *Triodia pisoliticola* PEC populations in the west Pilbara, all of which were associated with mesa edges and gorgeous, generally from the Hamersley Range.

The location of the *Triodia pisoliticola* PEC (DBCA created) polygon, which intersects the Robe Mesa Project Disturbance envelope (associated with the PB13-3 bore location), is located on the Urandy (296Uy) Landsystem (**Figure 8.2.1**). The Urandy (296Uy) landsystem is described as stony plains, alluvial plains and drainage lines supporting shrubby soft spinifex grasslands and is not associated with the *Triodia pisoliticola* PEC.

DBCA (2022) describe the *Triodia pisoliticola* PEC as restricted to mesas and cordillo landforms. Such landforms are not present in the *Triodia pisoliticola* PEC (DBCA created) polygon, which intersects the Robe Mesa Project Disturbance envelope.

Identifying *Triodia pisoliticola* and/ or the *Triodia pisoliticola* PEC

The presence of *Triodia pisoliticola* does not necessary signify the presence of the *Triodia pisoliticola* PEC.

Triodia pisoliticola is easily identifiable during field assessments and even fly-over inspections (Western Botanical 2016, Newland Environmental 2021, Biota 2023). Mature flowering hummocks of *Triodia wiseana* and *Triodia pisoliticola* are easily differentiated from a distance, as the 'soft' (floppy) form of *Triodia pisoliticola* is distinctly different to the pungent and erect forms of other *Triodia* species that share similar habitats.

Following confirmation of *Triodia pisoliticola*, the presence of other species with *Triodia pisoliticola*, will determine if the vegetation type constitutes *Triodia pisoliticola* PEC.

Regional surveys by Western Botanical (2015) and Newland Environmental (2021) both found that *Triodia pisoliticola* PEC communities were easily identifiable visually with Acacia groves (*Acacia pruinocarpa* and/or *A. citrinoviridis)* on the edge of mesas and associated with soil loss and rocky substrates.

Defining the *Triodia pisoliticola* PEC

The description of the *Triodia pisoliticola* PEC has been revised and refined by DBCA, in consultation with APIM, since 2011. In general, the following components potentially represent the *Triodia pisoliticola* PEC (Western Botanical 2015; and Newland Environmental 2021):

Species composition and abundance elements:

- *Triodia pisoliticola* – must be dominant. It is not considered PEC if *Triodia pisoliticola* is solely present (i.e. without the suite of species listed below).
- *Acacia citrinoviridis* and/or *Acacia pruinocarpa* – must be present (not required to be dominant). Ideal to have both species present with *Triodia pisoliticola*.
- Other species considered within the PEC include *Gossypium robinsonii*, *Petalostylis labicheoides* and *Stylobasium spathulatum* – but must also be present with *Acacia citrinoviridis* or *Acacia pruinocarpa*).
- It is not considered PEC if *Eucalyptus leucophloia* is dominant, although this species may be scattered (in very low abundance) within the PEC.

Landform elements

- Mesa and cordillo landforms.
- Robe pisolite mesas and breakaway slopes.

Potential *Triodia pisoliticola* PEC at the Robe Mesa Project

Following field inspection, the habitat and the vegetation of the Robe Mesa Project area was considered unlikely to support the *Triodia pisoliticola* PEC. This community typically occurs on the edges and upper slopes of geologically distinct mesas, immediately below mesa edge breakaways.

Landforms assessed as potentially containing *Triodia pisoliticola* PEC, present more as a steep rocky hills with large boulders, rather than a mesa with exposed vertical faces on the margins. The vegetation of these landforms mapped as A6, and comprised *Acacia arida, Senna glutinosa* subsp. *pruinosa* tall open shrubland over *Triodia wiseana* open hummock grassland. Characteristic indicator species of the *Triodia pisoliticola* PEC, *Acacia pruinocarpa* and *A. citrinoviridis*, were also not observed or recorded. The section of Robe Mesa Project Disturbance envelope that intersects the buffer of the *Triodia pisoliticola* PEC did not record species typical of the *Triodia pisoliticola* PEC (**Table 8.4.3**).

The section of Robe Mesa Project Disturbance envelope that intersects the buffer of the *Triodia pisoliticola* PEC also requires very minimal clearing (1.4 ha) (**Figure 8.4.8**). This part of the Disturbance envelope accommodates an already cleared pad associated with the existing production bore PB13-3 (**Figure 8.4.9**). The pipeline route running north to the Project operations area (i.e. the mine, village, processing area etc.) will also lay along an existing track within the Disturbance envelope. The proposed clearing at the water supply bore (the existing PB13-3), and pipeline has been included to allow for any clearing of regrowth for project completeness.

Within the area of Disturbance envelope that intersected the *Triodia pisoliticola* PEC, no vegetation units contained species that were consistent with the *Triodia pisoliticola* PEC (**Table 8.4.3** and **Figure 8.4.10**). It should also be noted that disturbance within this area is restricted to the plains (location of the existing production bore) and is not associated with any topographical landforms.

It should also be noted that the part of the Disturbance envelope that sits within the buffer of the *Triodia pisoliticola* PEC does not require clearing (**Figure 8.4.8**). This section of the Application area will accommodate the already cleared pad associated with the existing production bore PB13-3. The pipeline route running north to the project site will lay along an existing track within the Application area. The water supply bore, and pipeline have been provided in the application for project completeness, in order that the Application area incorporates all components of the Mining Proposal.

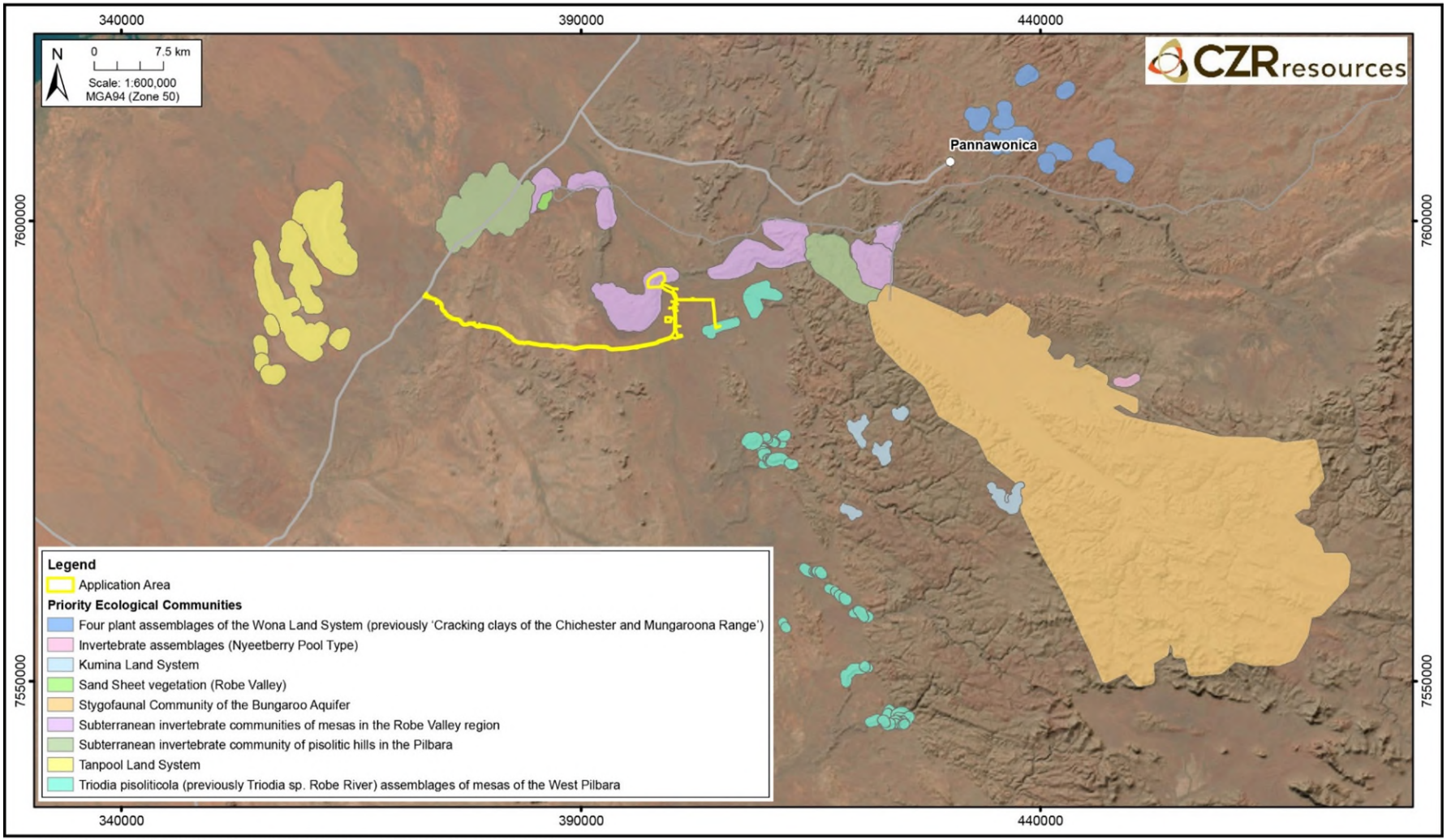
Table 8.4.3 : Vegetation Units associated with *Triodia pisoliticola* PEC polygon that intersects the Robe Mesa Project

Veg ID	Vegetation Unit Description	Key Species*	Area within Disturbance Envelope (ha), Portion of survey extent (%)	Area within Disturbance Footprint (ha), portion of survey extent (%)
A4 -	Mixed Acacia spp. over *Triodia epactia*.	*Acacia inaequilatera* *A. synchronicia* *A. trachycarpa* *Bonamia erecta* *Indigofera boviperda* *Senna artemisioides* subsp. *oligophylla* *Gossypium australe* *Ptilotus astrolasius* *Hibiscus sturtii* *Bulbostylis barbata* *Chrysopogon fallax* *Eriachne pulchella* *Sporobolus australasicus*	3.99 (0.3%)	0.87 (0.1%)
S1 -	Senna spp. and *Acacia bivenosa* over *Triodia wiseana*.	*Corymbia hamersleyana* *Acacia ancistrocarpa* *A. synchronicia* *A. trachycarpa* *A. wanyu* *Gossypium australe* *Sida echinocarpa* *Triumfetta clementii* *Trichodesma zeylanicum* var. *zeylanicum* *Cymbopogon ambiguous* *Enneapogon caerulescens* *E. polyphyllus* *Eriachne mucronate* *Paspalidium clementii*	1.61 (1.6%)	0.47 (0.5%)
A3 -	Mixed Acacia spp. over *Triodia wiseana*.	*Acacia inaequilatera* *A. synchronicia* *Bonamia erecta* *Indigofera boviperda* subsp. *boviperda* *Ptilotus astrolasius* *Senna notabilis* *S. glutinosa* subsp. *pruinosa* *Trichodesma zeylanicum* var. *zeylanicum* *Aristida holathera* var. *holathera*	0.16 (0.02%)	0.04 (0.005%)

Table 8.4.3 : Vegetation Units associated with *Triodia pisoliticola* PEC polygon that intersects the Robe Mesa Project				
Veg ID	**Vegetation Unit Description**	**Key Species***	**Area within Disturbance Envelope (ha), Portion of survey extent (%)**	**Area within Disturbance Footprint (ha), portion of survey extent (%)**
		Eriachne pulchella *Paraneurachne muelleri* *Triodia epactia*		

*key species required for *Triodia pisoliticola* PEC: *Triodia pisoliticola, Acacia citrinoviridis*, *Acacia pruinocarpa, Gossypium robinsonii*, *Petalostylis labicheoides*, *Stylobasium spathulatum* – none of which are listed in this Table.

Figure 8.4.8 : Ecological Communities of the Robe Mesa Project



Drawn: CAD Resources (08 9246 3242), Date: Jun 2023, CAD Ref: a2967_F001_12, Rev: A ~ PEC: DBCA

Figure 8.4.9 : The Robe Mesa Project and the *Triodia pisoliticola* PEC

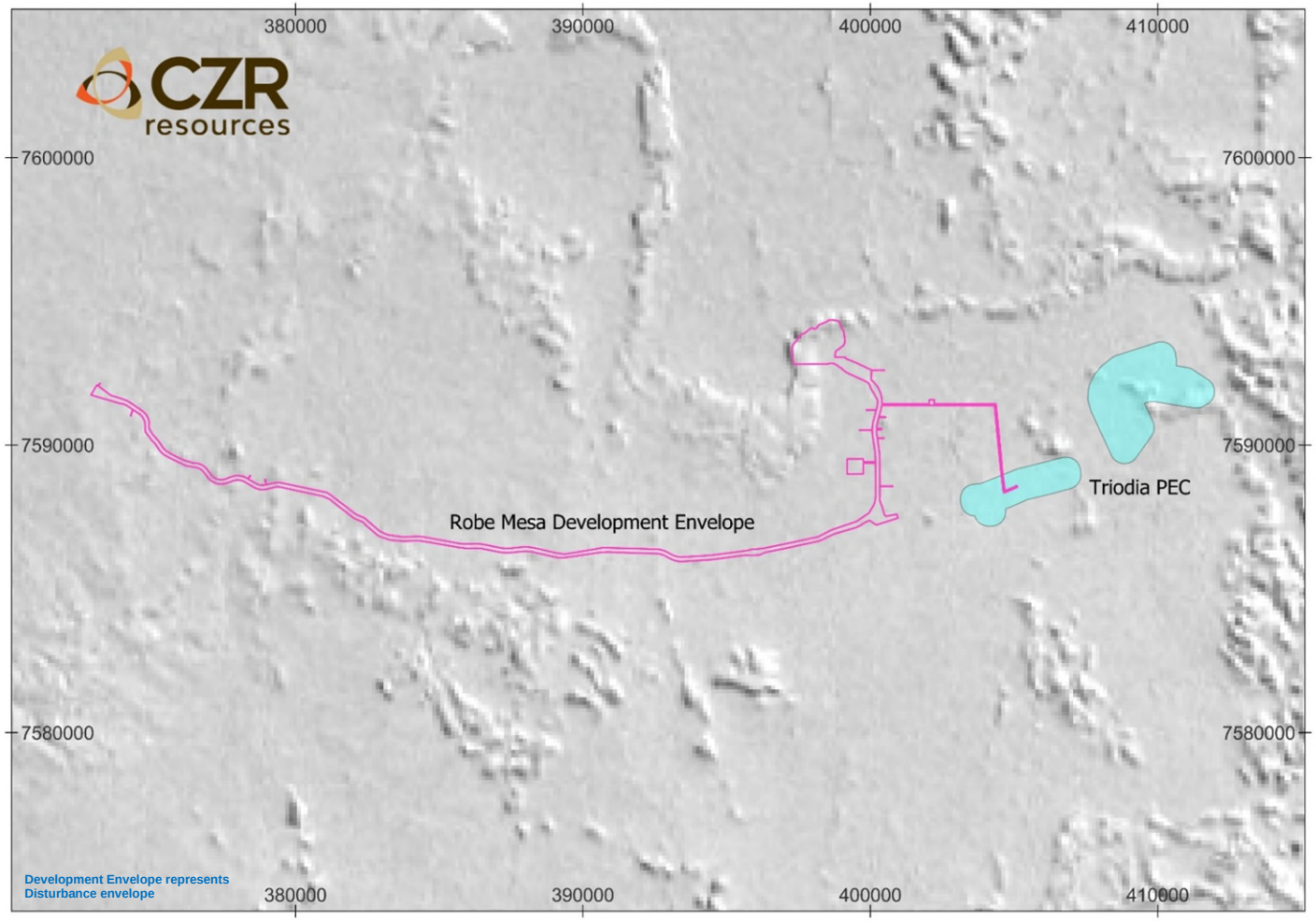
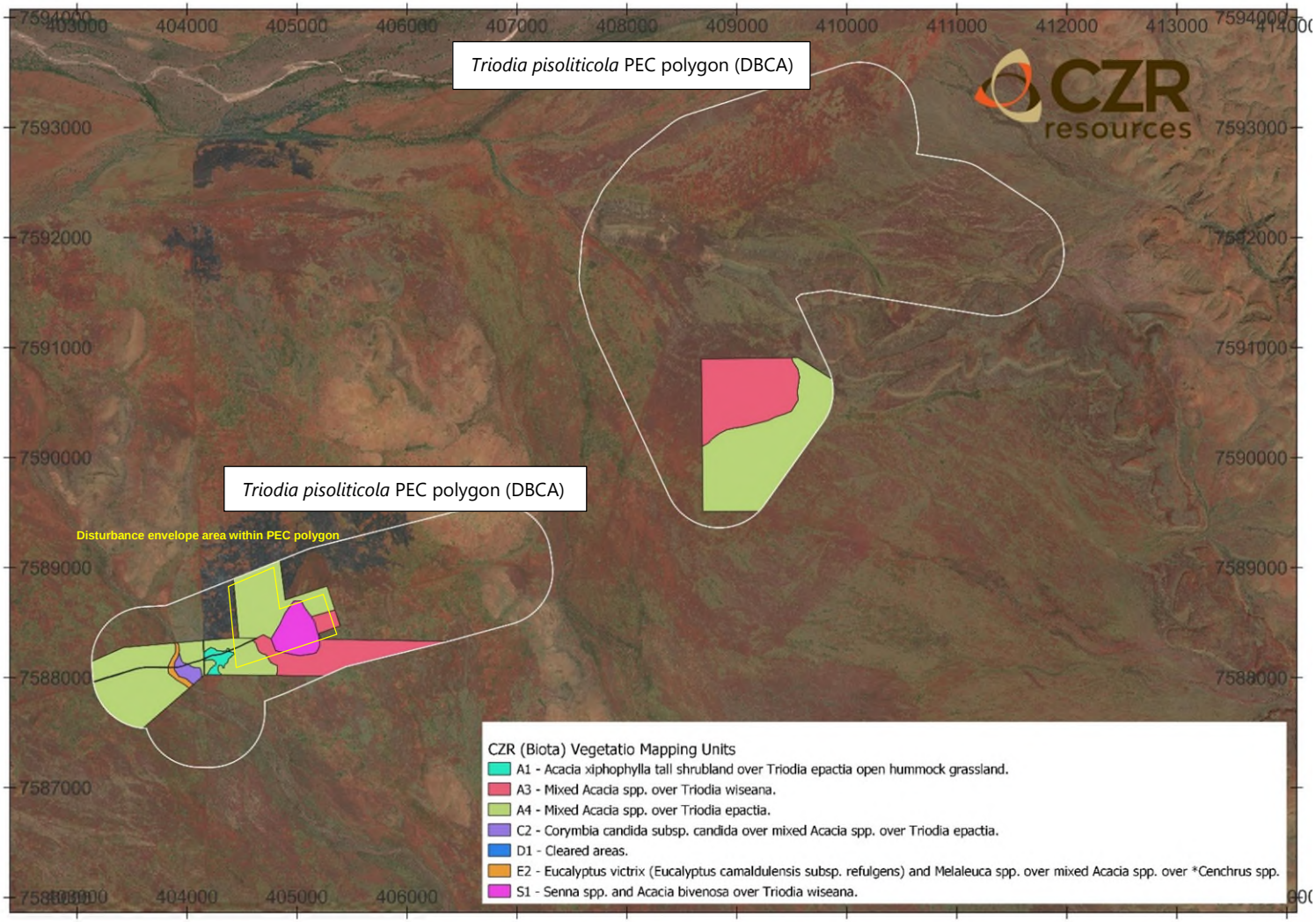


Figure 8.4.10 : Vegetation mapping of the Robe Mesa Project within *Triodia pisoliticola* PEC



Other potential Triodia PEC of the project area

Triodia pisoliticola plants are present within two mapped vegetation types of the Robe Mesa Project Disturbance envelope (RPS 2021), El.Aa.TwTp and El.Aa.TwTp. The presence of *Triodia pisoliticola* alone does not necessarily represent the PEC.

As described above, the description of the *Triodia pisoliticola* PEC has been revised and refined by DBCA, in consultation with APIM, since 2011. In general, the following components potentially represent the *Triodia pisoliticola* PEC (Western Botanical 2015; and Newland Environmental 2021):

Species composition and abundance elements:

- *Triodia pisoliticola* – must be dominant. It is not automatically considered PEC just because *Triodia pisoliticola* is present.
- *Acacia citrinoviridis* and/or *Acacia pruinocarpa* – must be present (not required to be dominant). Ideal to have both species present with *Triodia pisoliticola*.
- Other species considered within the PEC include *Gossypium robinsonii*, *Petalostylis labicheoides* and *Stylobasium spathulatum* – but must also be present with *Acacia citrinoviridis* or *Acacia pruinocarpa*).
- It is not considered PEC if *Eucalyptus leucophloia* is dominant, although this species may be scattered (in very low abundance) within the PEC.

Landform elements

- Mesa and cordillo landforms.
- Robe pisolite mesas and breakaway slopes.

Two vegetation types mapped with the Robe Mesa project Disturbance envelope contained *Triodia pisolitica* (Vegetation E3 and E4). Of these, only E3 was recorded within the proposed disturbance footprint, and represented 0.5 ha disturbance (**Table 8.4.4**). This vegetation type is associated with the mesa edge and the disturbance proposed is associated with the access ramp to the mesa top. A minimal disturbance footprint is required within this vegetation type.

Following field inspections, it was noted by Biota (2023) that the vegetation was considered unlikely to support the *Triodia pisoliticola* PEC. This community typically occurs on the edges and upper slopes of geologically distinct mesas immediately below the mesa edge breakaway. Potential areas of the Robe Mesa Project area presented more as steep rocky hills with large boulders, rather than a mesa with exposed vertical faces on the margins. Characteristic indicator species of the PEC, such as *Acacia pruinocarpa* and *A. citrinoviridis*, were also not observed.

Table 8.4.4 : Vegetation mapping of the Robe Mesa Project

Unit ID*	Description (including RPS 2021 vegetation unit code)	Significant species associated vegetation unit	Survey extent (ha)	Disturbance envelope (Application area) (ha)	Disturbance footprint (ha)
E3	El.Aa.TwTp - *Eucalyptus leucophloia* Low Isolated Clumps of Trees over *Acacia arida* Isolated Clumps of Shrubs over *Triodia wiseana* and *T. pisoliticola* Sparse Hummock Grassland	*Triodia pisoliticola* (P3)	16.8	13.1	0.5
E4	El.AtuGr - *Eucalyptus leucophloia* Low Open Woodland over *Gossypium robinsonii* and *Acacia tumida* var.	*Triodia pisoliticola* (P3)	1.8	1.4	-

Unit ID*	Description (including RPS 2021 vegetation unit code)	Significant species associated vegetation unit	Survey extent (ha)	Disturbance envelope (Application area) (ha)	Disturbance footprint (ha)
	pilbarensis Tall Open Shrubland over *Acacia arida* Mid Open Shrubland Over *Triodia wiseana*, (*Triodia pisoliticola*) Open Hummock Grassland				

8.4.2.3 Groundwater Dependent Vegetation

Three vegetation units (E2; E5; and M1) represent groundwater dependent vegetation, comprising drainage systems that support *Eucalyptus victrix* (low to moderate dependence), *Eucalyptus camaldulensis subsp. refulgens* (moderate dependence) and/or *Melaleuca argentea* (high dependence). These three species are all indicator species of groundwater dependent vegetation (Rio Tinto 2020). Of these vegetation units, only E2 is mapped within the Disturbance envelope and only represents 0.5 ha of the disturbance footprint (associated with drainage crossing points along the transport corridor).

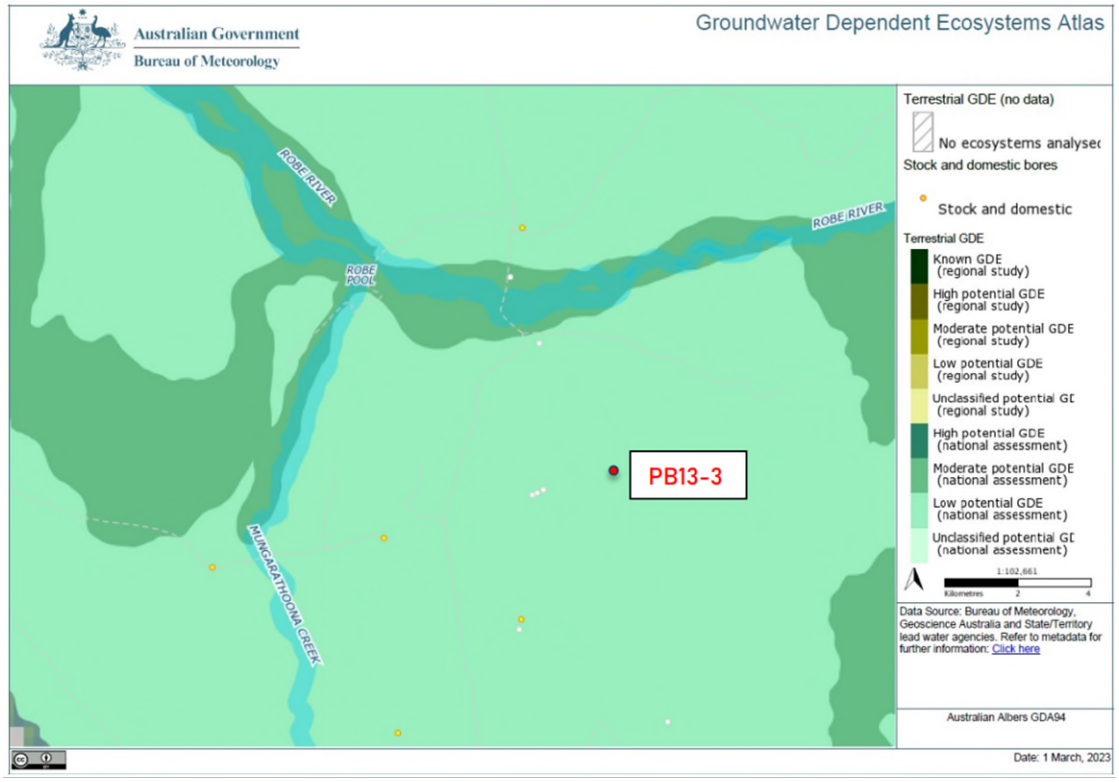
The Robe Mesa Project will not be dewatering the mine pit as current groundwater levels are approximately 50-60 m below the mesa surface and mine pits will extend no more than 40 m below the mesa surface.

There will be no drawdown of groundwater contours at the mine area. The groundwater supply for the project is based on an existing Production Bore (PB13-3), which is located approximately 8km southeast away from the Robe River pools and the mine area and any groundwater dependent vegetation, with no E2 vegetation unit mapped nearby.

There are no Groundwater Dependent Ecosystems or Vegetation (**GDEs** or **GDVs)** associated with the location of Production bore PB13-3 (**Figure 8.4.11**). The predicted drawdown impact of abstraction of 17 L/s from the PB13-3 are minimal. The cone of depression that would be generated by water supply pumping would be elliptical in shape, elongated in a north-south direction (along the fault zone). The maximum theoretical extent of the cone of depression is predicted to be 5.2 km along the fault zone and 1.5 km across the fault zone (in unfractured bedrock). This is a conservative assessment that assumes no recharge (AQ2 2024b).

PB13-3 is currently licensed under GWL180637 (APIM) to sustainably abstract up to 95,000 kLpa. CZR has applied to transfer PB13-3 from the APIM held GWL, to a new CZR GWL (Water Online Ref 056535). This GWL application seeks to increase the water allocation to 540,000 kLpa (AQ2 2024b).

Figure 8.4.11: Desktop GDE search of PB13-3 (BOM GDE Atlas) (Source: AQ2:2023)



8.4.2.4 Vegetation Condition

The condition of the vegetation ranged from 'Excellent' to 'Completely Degraded', with most (over 95%) ranked from 'Very Good' or better condition. Poor condition sites are generally associated with existing tracks and other pastoral infrastructure.

8.4.3 Flora

A total of 422 confirmed native flora species from 161 genera. The most common families recorded included Fabaceae, Malvaceae, Poaceae, Asteraceae, Amaranthaceae, Chenopodiaceae, Convolvulaceae, Cyperaceae.

8.4.3.1 Conservation Significant Flora

Three flora species, *Aluta quadrata, Quoya zonalis* and *Thryptomene wittweri*, are listed as Threatened for the Pilbara bioregion (**Table 8.4.5**). Based on their known distribution and habitat preferences, none of these species would occur within the Disturbance envelope (**Figure 8.4.12**).

No Threatened flora species were recorded from the survey area based on their preferred habitats.

Table 8.4.5 : Threatened Flora species listed for the Pilbara bioregion

Species	Significance		Distribution overlaps survey area
	State	Commonwealth	
Aluta quadrata	EN	-	No – restricted to southern Pilbara / northern Gascoyne (>200 km southeast)
Quoya zonalis (Pilbara Foxglove)	EN	EN	No – restricted to ranges of hills west of Marble Bar.
Thryptomene wittweri (Mountain Thryptomene)	VU	VU	No – known from a few widely separated locations on mountain tops in the southern Pilbara, western Gascoyne, and western Little Sandy Desert (>200 km southeast)

EN – Endangered; VU - Vulnerable

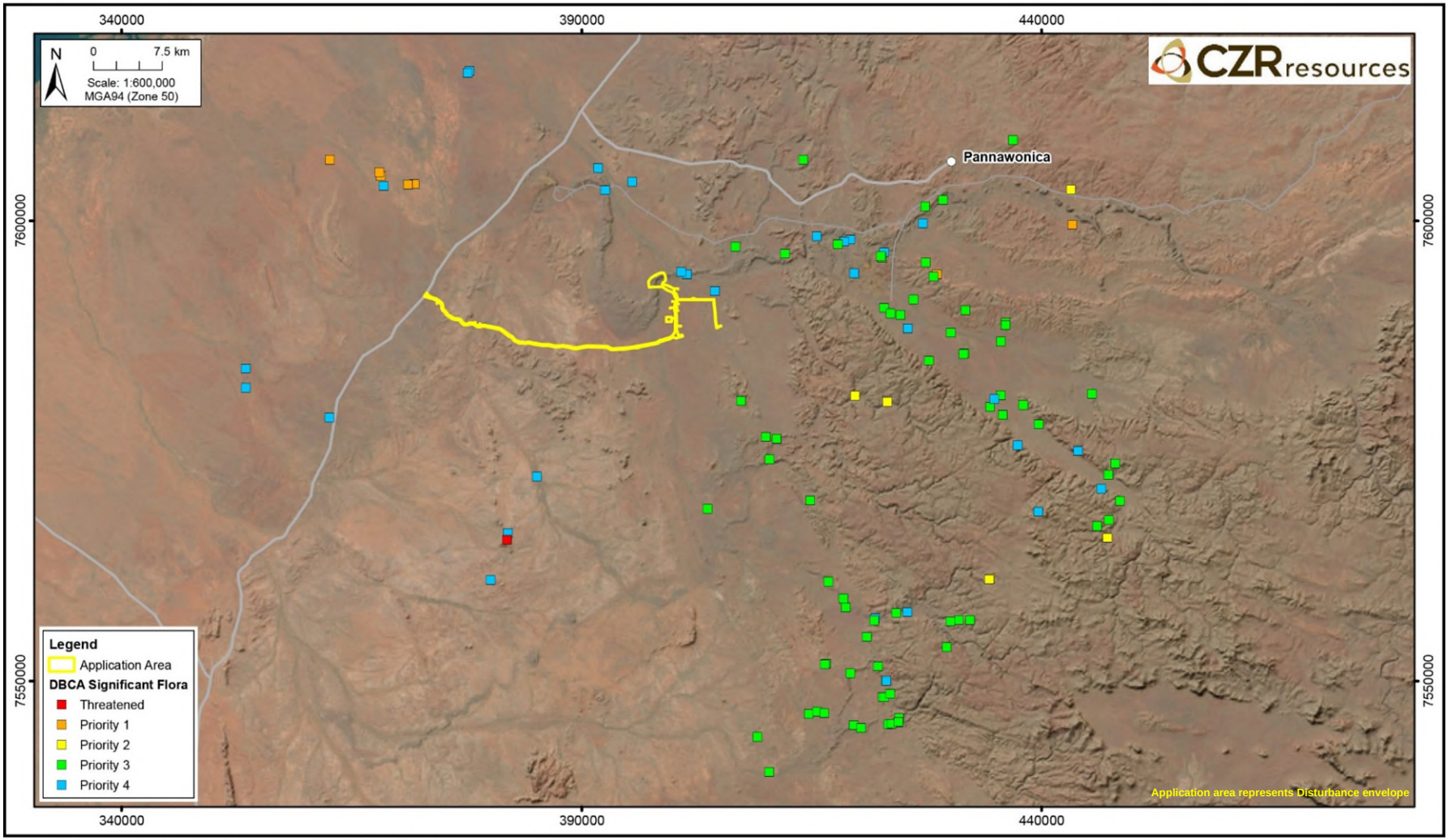
Six Priority Flora species were considered likely to, or may, occur, based on local records or potential habitat. These six species above formed the basis for targeted searches during surveys of the Disturbance envelope (RPS 2021, Biota 2023a):

- *Eragrostis crateriformis* (P3) was known to occur from previous surveys (RPS 2021).
- *Rhynchosia bungarensis* (P4) was recorded from numerous locations in the vicinity.
- *Triodia mallota* (P1) has potential to occur if suitable shale habitat was present.
- *Eragrostis surreyana* (P3) often occurs with Rhynchosia bungarensis (P3).
- *Solanum* sp. Red Hill (S. van Leeuwen et al. PBS 5415) (P3) may occur if suitable hills habitat was present.
- *Triodia pisoliticola* (P3) was recorded locally on the edges of mesas.

Three Priority species were confirmed from the surveys, *Eragrostis crateriformis* (P3) (**Figure 8.4.13**), *Goodenia nuda* (P4) (**Figure 8.4.14**) and *Triodia pisoliticola* (P3) (**Figure 8.4.15**).

The three recorded Priority Flora are described below and their distribution across the survey area is presented in **Figure 8.4.16** and **Figure 8.4.17**.

Figure 8.4.12 : Threatened and Priority Flora regional mapping, DBCA search.



Drawn: CAD Resources (08 9246 3242), Date: Jun 2023, CAD Ref: a2967_F001_13, Rev: A ~ Flora: DBCA

Eragrostis crateriformis (P3)

Eragrostis crateriformis is an annual grass growing to 40 cm tall and commonly found in clayey loam or clay on creek banks and depressions in the landscape (**Figure 8.4.13**).

Eragrostis crateriformis (P3) was recorded from 376 locations across the survey area (**Figure 8.4.16** and **Figure 8.4.17**), of which 70 records (18.6% of survey records) are within the Disturbance footprint (from 122 within the Disturbance envelope). A total of 3,481 individuals were recorded from six vegetation types within the Disturbance envelope (A1, A4, C1, C2, C5, E2).

Figure 8.4.13 : Photograph of Eragrostis crateriformis (P3)

Goodenia nuda (P4)

Goodenia nuda is an erect to ascending herb growing to 0.5 m high with yellow flowers (**Figure 8.4.14**). The species occurs on hardpan plains and along drainage lines on red clayey loam throughout the Pilbara region (WAH 2021).

A total of 117 individuals were recorded at 26 locations within the survey area within one vegetation unit, C2 (**Figure 8.4.16** and **Figure 8.4.17**). No records of *Goodenia nuda* are within the Disturbance footprint (or Disturbance envelope).

Triodia pisoliticola (P3)

Triodia pisoliticola is a 'soft' spinifex grass growing to 1 m high with sprawling pale green foliage (**Figure 8.4.15**). The species occurs on the slopes and crests of ironstone hills and mesas, on red-brown sandy loams with ironstone pebbles, stones, and outcropping rock (WAH 2021; Barrett and Trudgen 2018). Most of the known records are on the edges and tops of mesas capped with Robe Pisolite (Barrett and Trudgen 2018).

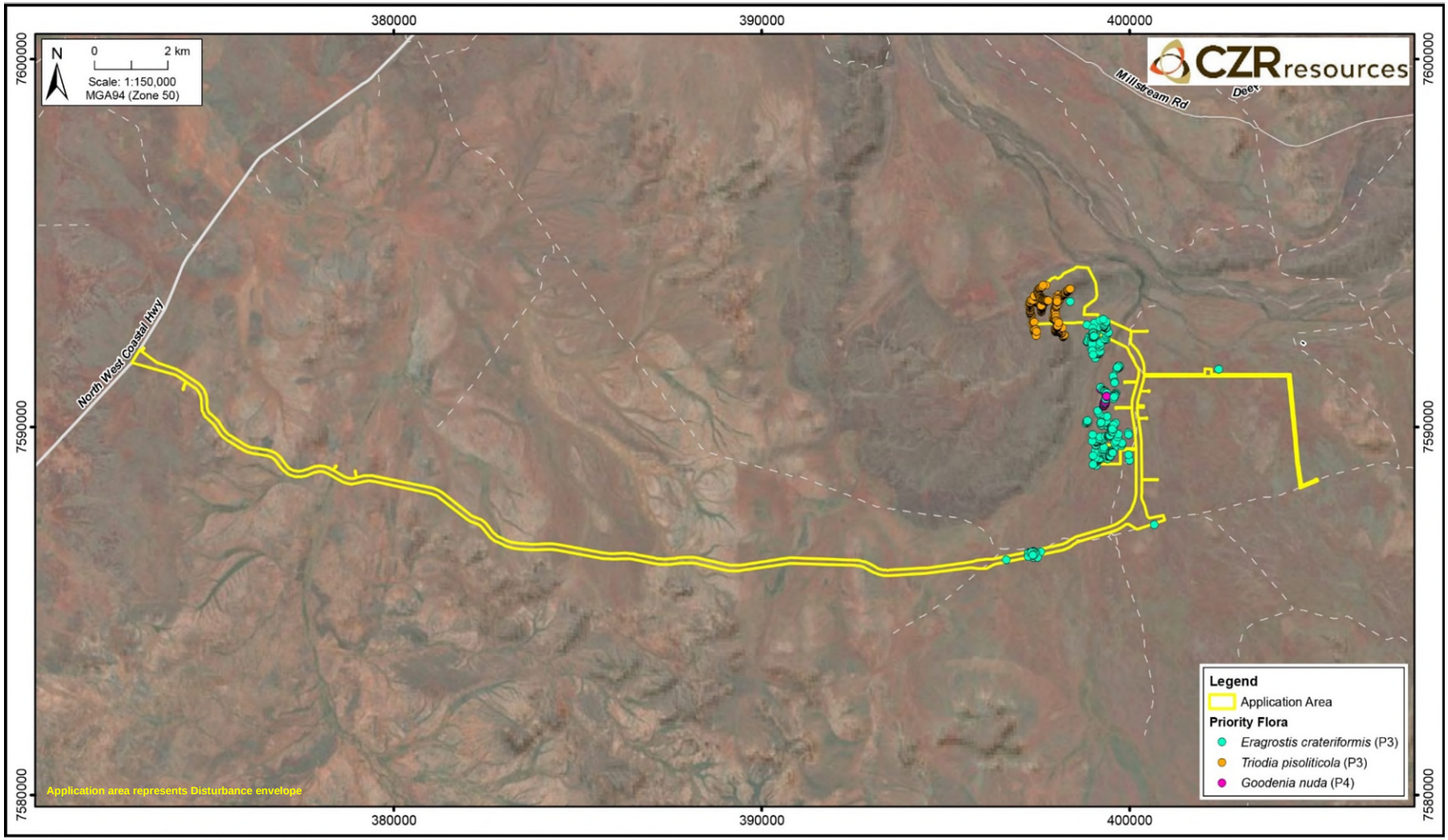
The species occurs in the west Pilbara region, with a range of about 200 km in the Robe River Valley.

More than 12,000 individuals were recorded from 412 locations within the survey area within two vegetation units, E3 and E4 (**Figure 8.4.16** and **Figure 8.4.17**). Of the 412 recorded locations, only 21 of these (5.1%) are within the Disturbance footprint.

Figure 8.4.14 : Photograph of Goodenia nuda (P4) on clay flats

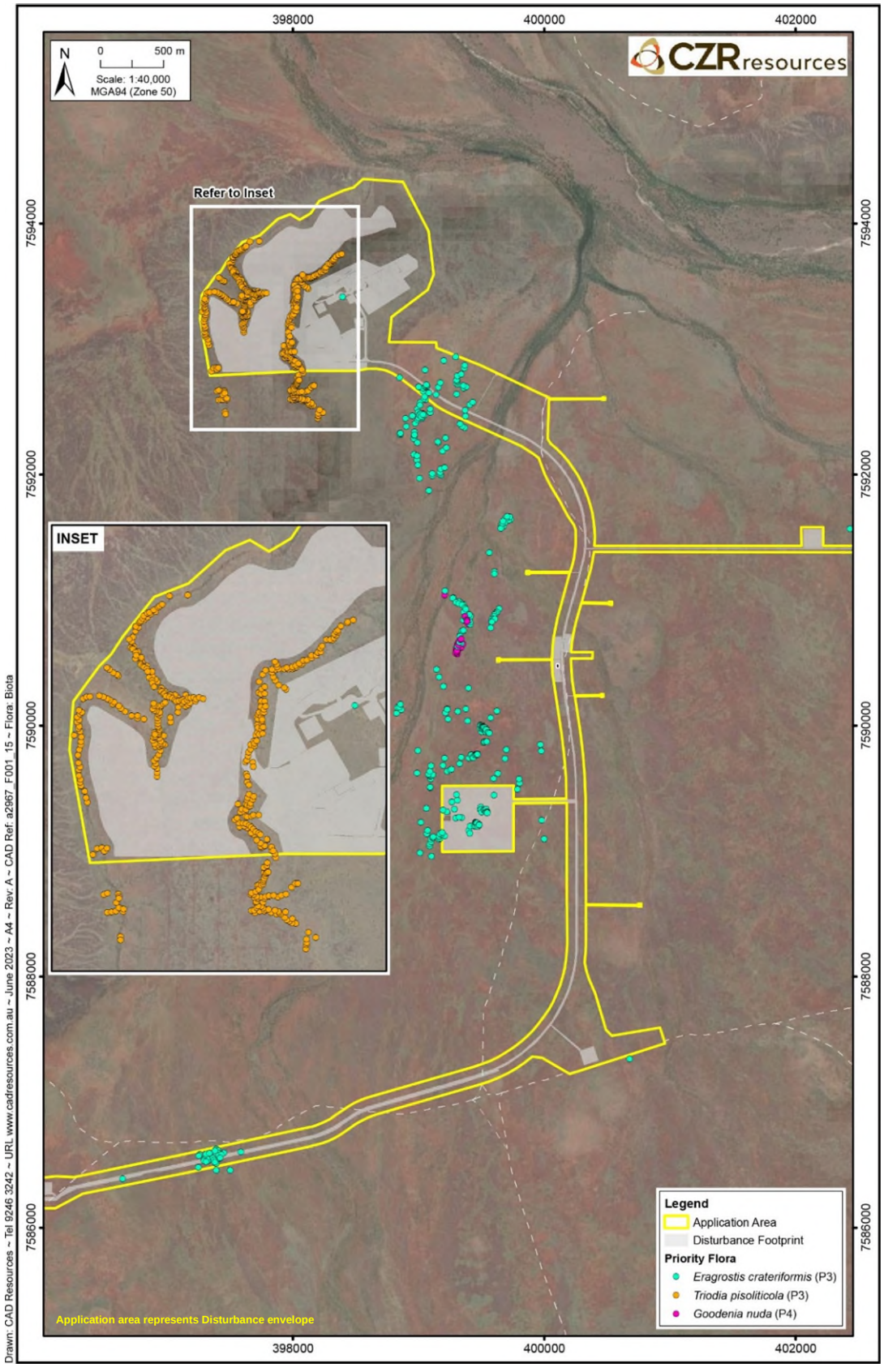
Figure 8.4.15 : Photograph of Triodia pisoliticola (Source: Barrett and Trudgen 2018)

Figure 8.4.16 : Priority Flora records from the Robe Mesa Project



Drawn: CAD Resources (08 9246 3242), Date: Jun 2023, CAD Ref: a2967_F001_14, Rev: A ~ Imagery: ESRI, Maxar (Oct 2021), Flora: Biota

Figure 8.4.17 : Priority Flora records from the Robe Mesa Project, Inset Map



8.4.3.2 Weeds

Eighteen weed species were recorded from the survey area (as well as sterile material referred to as **Cenchrus* sp., which is assumed to represent one of the three recorded *Cenchrus species). None of the species recorded are listed as WoNS (Thorp and Lynch 2000) or are Declared Pests under the WA Biosecurity and Agriculture Management Act 2007 (the BAM Act) (DPIRD 2022).

8.4.4 Terrestrial Fauna

Information in this section is based on the following supporting studies:

- Bamford Consulting Ecologists (2024a). CZR Resources Ltd. Robe Mesa Iron Ore Project Fauna Assessment. (Replaced BCE 2023 - Appendix 8-5)
- Lloyd George Acoustics (2023). Environmental Noise Assessment - Robe Mesa Project (Appendix 8-6)
- Bamford Consulting Ecologists (2024b). Robe Mesa Project, Fauna species Matters of National Environmental Significance Threats and Mitigation. Response to DEMRIS RFI. Memo report 14 Oct 2024.
- Bamford Consulting Ecologists (2024c). Robe Mesa Project. Response to comments provided by DEMIRS Feb and Aug 2024

8.4.4.1 Habitat

The Project area encompasses a mesa, scattered rocky hills, plains and drainage systems that range from minor creek lines to large river systems. Eight major Vegetation and Substrate Associations (VSA) or habitat types were identified in the overall project area, of which six are within the Disturbance footprint (**Table 8.4.6, Figure 8.4.18** and **Figure 8.4.19**).

These VSAs have been mapped based on project vegetation mapping (Biota 2023a and 2023b). This mapping combines vegetation types from Biota (2023a) and RPS (2021) which has been interpreted to match up vegetation types with corresponding BCE VSAs.

The mine is restricted to the mesa tops, which have low habitat value. The mine plant and other infrastructure is predominately within the VSA3 habitat, which is the most extensive habitat type of the project area.

The corridor to the North West Coastal Highway and the mine passes mostly over slightly undulating plains with scattered bloodwood over spinifex on gravelly loam (VSA3) (**Figure 8.4.18**).

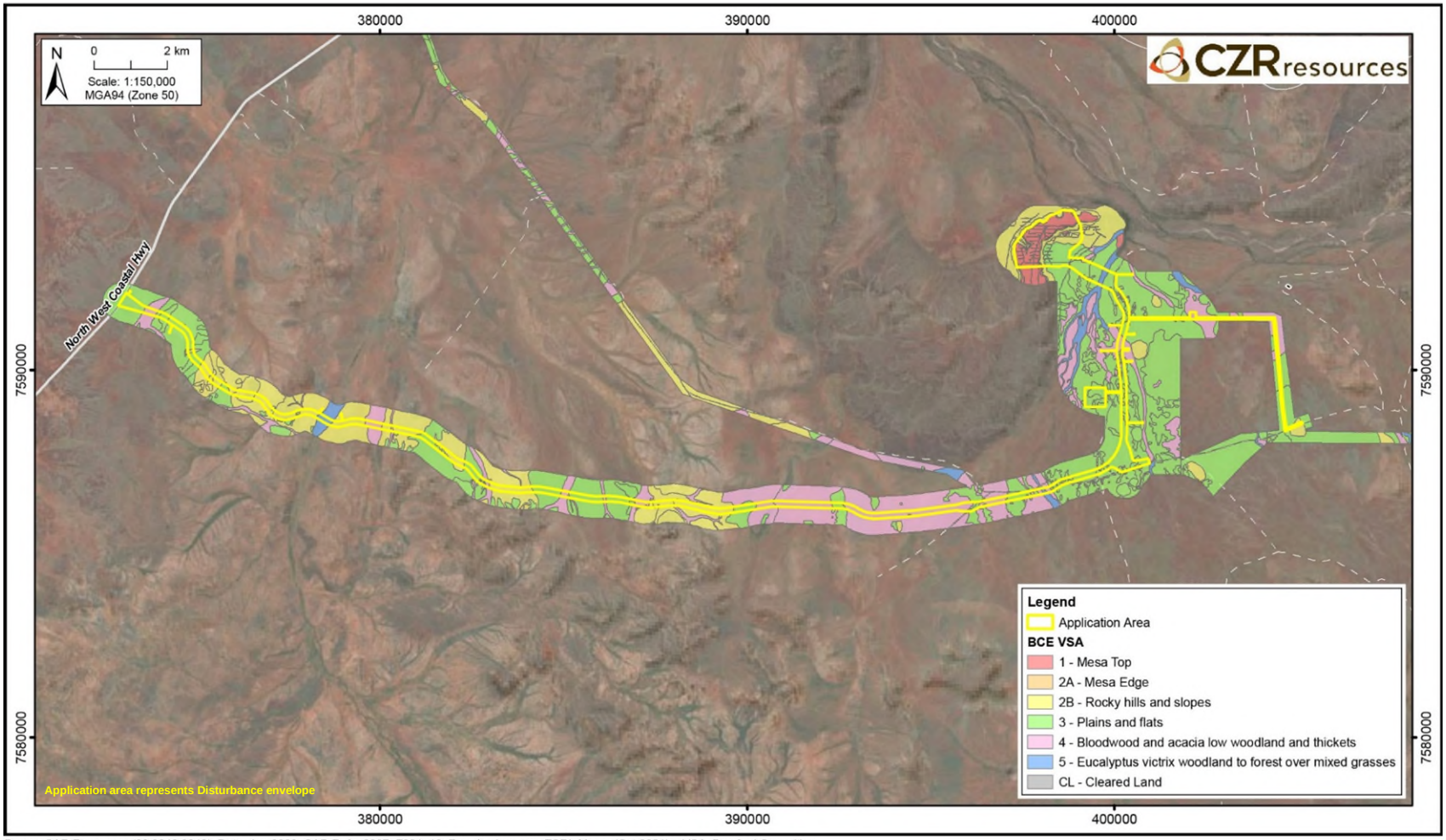
Figure 8.4.18 : Typical plains and rocky hills habitats of the access road route

Table 8.4.6 : Habitat types (VSAs) of the Robe Mesa Project							
Unit ID	**Description**	**Typical photo**	**Survey extent (ha)**	**Disturbance envelope (ha)**	**Proportion of Surveyed Extent in Disturbance envelope (%)**	**Disturbance footprint (ha)**	**Proportion of Surveyed Extent in Disturbance footprint (%)**
Mesa Tops VSA1	Acacia low shrubland with scattered eucalypts over spinifex on shallow gravelly soil with some exposed rock. Often patches of several hectares with spinifex and no other vegetation. Occurs in the mining area.		139.0	92.3	66.4	65.0	46.8% of VSA1 surveyed extent is in Disturbance footprint. VSA1 represents 24.1% of total Disturbance footprint area
Mesa Edges VSA2a	Exposed rock often vertical with caves and overhangs. Scattered eucalypts, Rock Fig, shrubs, and spinifex where plants able to 'get a hold'. Scree slope variable in width; steep with lot of loose rock but bout 50% spinifex cover and occasional shrub. A major feature of the margin of the mesa.		16.8	13.1	77.8	0.5	2.7% of VSA2a surveyed extent is in Disturbance footprint. VSA2a represents 0.2% of total Disturbance footprint area
Rocky Hills and Slopes VSA2b	Lower scree slope around mesa edge, but also occurs as isolated rocky and in some cases gravelly hills.		1,411.7	199.5	14.1	48.7	3.5% of VSA2b surveyed extent is in Disturbance footprint. VSA2b represents 18.1% of total Disturbance footprint area

Table 8.4.6 : Habitat types (VSAs) of the Robe Mesa Project							
Unit ID	**Description**	**Typical photo**	**Survey extent (ha)**	**Disturbance envelope (ha)**	**Proportion of Surveyed Extent in Disturbance envelope (%)**	**Disturbance footprint (ha)**	**Proportion of Surveyed Extent in Disturbance footprint (%)**
Plains and Flats VSA3	These are very extensive. Mostly scattered acacia thickets (*Acacia xiphophylla*) over spinifex (*Triodia*) on gravelly loam soil to sandy loam flats. Some slightly rocky rises merged with VSA 2B.		3,637.6	418.0	11.5	109.6	3% of VSA3 surveyed extent is in Disturbance footprint. VSA3 represents 40.7% of total Disturbance footprint area
Minor drainage and shallow valleys VSA4	Bloodwood and acacia low woodland and thickets on alluvial loams along minor drainage lines and in shallow valleys of plains.		1,458.5	158.3	10.9	39.4	2.7% of VSA4 surveyed extent is in Disturbance footprint. VSA4 represents 14.6% of total Disturbance footprint area
Floodplains and drainage lines VSA5	*Eucalyptus victrix* woodland to forest over mixed grasses, including Buffel Grass, on alluvial loams; effectively floodplain of larger drainage lines.		179.5	13.9	7.8	1.5	0.8% of VSA5 surveyed extent is in Disturbance footprint. VSA5 represents 0.6% of total Disturbance footprint area

Table 8.4.6 : Habitat types (VSAs) of the Robe Mesa Project							
Unit ID	**Description**	**Typical photo**	**Survey extent (ha)**	**Disturbance envelope (ha)**	**Proportion of Surveyed Extent in Disturbance envelope (%)**	**Disturbance footprint (ha)**	**Proportion of Surveyed Extent in Disturbance footprint (%)**
Gallery Forests near Pools VSA6 **Not in Disturbance envelope or Disturbance footprint**	*Melaleuca* and *Eucalyptus* gallery forest along seasonal and permanent pools on brown loam and gravel.		29.7	0.01	0.02	0.0	0% of VSA6 surveyed extent is in Disturbance footprint. VSA6 represents 0% of total Disturbance footprint area
Pools VSA7 **Not in Disturbance envelope or Disturbance footprint**	Main Robe Pool is permanent and supports Typha and Phragmites beds, with some submerged aquatics. Substrate is loam and clay so water turbid with suspended sediments. Also, semi-permanent pools of Warramboo Creek where the southern access route option crosses.		5.6	0.0	0.0	0.0	0% of VSA7 surveyed extent is in Disturbance footprint. VSA7 represents 0% of total Disturbance footprint area

Figure 8.4.19 : Habitat Mapping of the Robe Mesa Project



Drawn: CAD Resources (08 9246 3242), Date: Jun 2023, CAD Ref: a2967_F001_16, Rev: A ~ Imagery: ESRI, Maxar (Oct 2021) ~ VSA: Bamford Consulting

8.4.4.2 Fauna assemblages

A total of 147 vertebrate fauna species were recorded in the project area (May and October 2021 and July and September 2022) (Bamford Consulting Ecologists 2022) (**Table 8.4.7**). This assemblage, including two introduced predators (fox and cat), represented typical and widespread species of the west Pilbara region.

Two species of frog are present, largely confined to low points in the landscape, with breeding taking place in pools and claypans. Adults will disperse widely, and individuals are likely to move across the project area. At least one species may be moderately abundant in the project area, particularly along the mesa edge and may breed in ephemeral pools adjoining the mesa.

The reptile assemblage comprises 43 species, with differing suites of species and abundance in different habitats (Bamford Consulting Ecologists 2022). The mesa top supports a limited number of species at low levels of abundance due to shallow soils and few microhabitats compared with the mesa edge and slopes. It is unlikely that any species are locally-confined to the mesa top, whereas there are species limited to the other habitats (mesa edge, sandy flats and forests along drainage lines; Bamford Consulting Ecologists 2022).

The avifauna of the project area is rich at 80 species, but again; the mesa top supports a very limited number of species at low levels of abundance due to a lack of habitat structural complexity (Bamford Consulting Ecologists 2022). No bird species are likely to be confined to the mesa top, but the tall, thick spinifex and woodlands on the lower slopes and outwash of the mesa may be locally important with higher levels of abundance of many species (Bamford Consulting Ecologists 2022).

The mammal fauna of the project area comprises 17 native species. The mesa edge is notable for a rich assemblage including several species of conservation significance. Mammal diversity and abundance on the mesa top is much lower due to the structural simplicity of the habitat. Some mesa edge species may forage across the mesa top, but rely more heavily on dense vegetation of lower slopes for foraging (Bamford Consulting Ecologists 2022).

Table 8.4.7 : Confirmed vertebrate fauna assemblage of the Robe Mesa Project (Feral/Introduction)

Taxon	Species	Number of species in each status category		
		Local	Regular visitor	Irregular visitor
Fish	3	3		
Frogs	2	2		
Reptiles	43	43		
Birds	80	59	19	2
Mammals	17 (2)	17 (2)		
Total	**145 (2)**	**124 (2)**	**19**	**2**

8.4.4.3 Significant Terrestrial Fauna

Three species listed under both the State *Biodiversity Conservation Act 2016* (**BC Act**) and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (**EPBC Act**) occur in the project area:

- Northern Quoll (Dasyurus hallucatus);
- Pilbara Leaf-nosed Bat (Rhinonicteris aurantia); and
- Ghost Bat (Macroderma gigas) (BCE 2022, 2023, 2024a).

Although the listed Pilbara Olive Python (Liasis olivaceus barroni) was not detected during field investigations, which is understandable as they are highly cryptic, DBCA deem that they are almost certainly present within the area, with recent records less than 1km from the mine pit (Bamford Consulting Ecologists 2024a).

All three recorded species and the Pilbara Olive Python are strongly associated with the mesa edge as core habitat, both for denning and roosting opportunities, and foraging resources. None of the species are restricted to the project area and all three recorded species are routinely recorded in the Robe River valley. No known maternity roosts for either bat species are present in the project area, and the Northern Quoll is present in relatively small numbers, typical of similar habitat in the locality (Bamford Consulting Ecologists 2022). The temporary bat roosts that are present are associated with the mesa edge and are located within the project No-Go-Areas.

Local watercourses such as Mungarathoona Creek, just east of the mine area, and Warramboo Creek at the southern haul road route, also provide suitable habitat for all four listed species, with rocky areas including mesas may be used for shelter during the cooler months (Bamford Consulting Ecologists 2024a).

8.4.4.4 Northern Quoll

In addition to the large number of records across the region, there have been several recent nearby records including Mesa A (Biota 2005) (12 km NW) and North of Red Hill (Biota 2009) (7 km S). Field investigations recorded Northern Quolls on cameras and with secondary evidence from tracks and scats. Records were mapped on mesa edges and drainage lines (**Figure 8.4.20**).

As with similar locations in the region, this species was most abundant around the mesa edge, with records also along the major drainage lines, and records of individuals moving across the flats. There were also records from some isolated hills in the project area, and along major drainage lines to the south-west. The BCE (2023 and 2024a) report does note the risk of population fragmentation due to the proposed haul road to the east of the mesa, but not specifically for Northern Quoll, and does consider the risk of mortality on that road (including for Northern Quoll). The risk of roadkill exists because Northern Quoll will readily cross roads, although this appears to be poorly documented except for the recognised risk of roadkill.

Mining infrastructure was also used for shelter (presenting a risk to the animals in some cases). The main risk from the proposed mine would appear to be deaths on roads and possibly from animals occupying infrastructure, rather than through a loss of movement across the landscape. Northern Quoll will use underpasses (Ecoscape 2021, Bleby et al. 2022) as a risk mitigation action for some mining projects in the Pilbara (Bleby et al. 2022). The position of the access haul road on the eastern side of the mesa and across Mungarathoona Creek lends itself to underpasses at the creek itself (where the creek will need to be crossed), and along the mesa edge.

The proposed road design includes 11 banks of culverts, primarily located to manage surface flow. However, given that the habitat types that intersect the haul road at drainage crossing points are sometimes also associated preferred dispersal and foraging habitat for Northern Quolls (drainage line habitat), these culvert locations also act as useful underpass locations for animals to cross safely and for preferred habitat to remain connected and unrestricted. The number and size of culverts varies along the road corridor depending on predicted flow rates at different locations, ranging from one 600mm culvert, up to seventeen 2100mm culverts at one location (see **Section 8.5.1.2**).

The proposed ramp connecting the mine pit to the mine operations centre, will intersect the mesa edge habitat and will therefore require an underpass-type structure to allow fauna such as the Northern Quoll to safely traverse along the mesa edge. Underpasses usually take the form of a culvert, as culverts allow for the free movement of a wide range of native species (MRWA 2010). Fencing can also be used to maximise the potential use of the underpass and to help prevent fauna moving on the roadway (MRWA 2010).

Although the use of underpasses by Northern Quolls is poorly-studied, the concept of fauna underpasses is not new, with knowledge on the installation and use of fauna underpasses increasing, based on experience in Australia and first principles of animal behaviour (MRWA 2010). Monitoring the effectiveness of the mesa edge underpass at the Robe Mesa Project would be valuable, and would contribute to the current knowledge base.

Disturbance to mesa edge habitat will be restricted to no more than 0.5 ha from the ramp. There are no Northern Quoll records from the location of the proposed haul road ramp, as the habitat at this location is not as steep and is therefore more like rocky hills than mesa edges. Occasional road crossings through minor drainage lines will represent the disturbance extent of this habitat type also.

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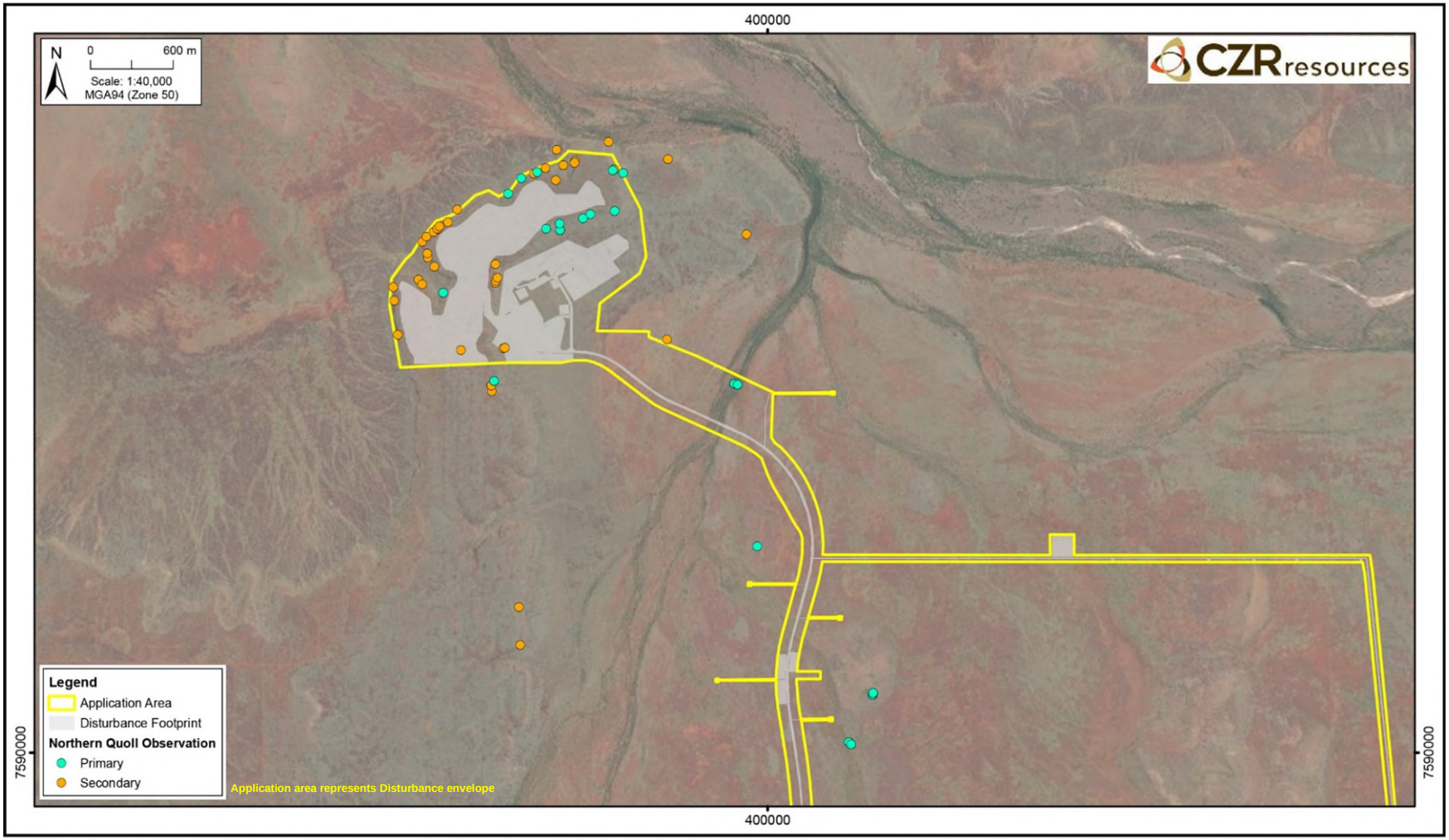
Figure 8.4.20 : Northern Quoll observations



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8.4.4.5 Conservation Significant Bats

The Pilbara Leaf-nosed Bat has been recorded extensively across the Robe Valley (Rio Tinto 2019), with historic records concentrated around areas of significant roost sites, often associated with disused mine infrastructure. Previous surveys of potential roosts across Mesa F have found no Pilbara Leaf-nosed Bat roosts (Rio Tinto 2019).

A further inspection of cave structures by BCE (2023, 2024a) considered the mesa edges of the Robe Mesa Project not suitable for maternity roosts.

Pilbara Leaf-nosed Bat records were in low numbers and were generally made late at night or about an hour before sunrise, suggesting the animals had travelled some distance from a roost site before they were detected (**Figure 8.4.21**).

There are multiple existing records of the Ghost Bat in the region, including one confirmed maternity roost in a gully on Mesa F over 2 km south of the project area and away from the Disturbance footprint. This roost supported about 70 animals in 2017 (Bat Call WA 2017).

Ghost Bat records were scattered around the margins of the mesa in the Project area (**Figure 8.4.21**), but numbers seen were always low, with the highest night count at the project area being three animals. Evening bat-watches took place in the breeding season in 2021 and 2022 and results suggest that the caves along the mesa edge in the project area are occasional used by small numbers of non-breeding animals. This is consistent with the structure of the caves, which were generally shallow, going back up to about 10 m but lacking the vertical interior chamber suggested to be important for maternity roosts.

Cave assessment:

Caves were assessed around the mesa but were not assigned categories as outlined in the DCCEEW conservation advice on the species (Threatened Species Scientific Committee (2016). The mesa landscape did not lend itself to the use of such categories as the mesa edge was a breakaway with more or less continuous overhangs, depressions, undercuts and shallow caves. It was thus difficult to recognise discrete locations. It was noted, however, that there was a large valley in the west with several probably interconnected caves, and that the western and northern mesa edge was a higher breakaway with more crevices than the eastern/southern edge. ARUs were deployed in May 2021 (10 locations), October/November 2021 (10 locations), July 2022 (4 locations) and September 2022 (5 locations). However, devices either failed or recorded no significant bat species in October/November 2021 and July 2022. Thus, useful data only from May 2021 (outside breeding season) and September 2022 (breeding season).

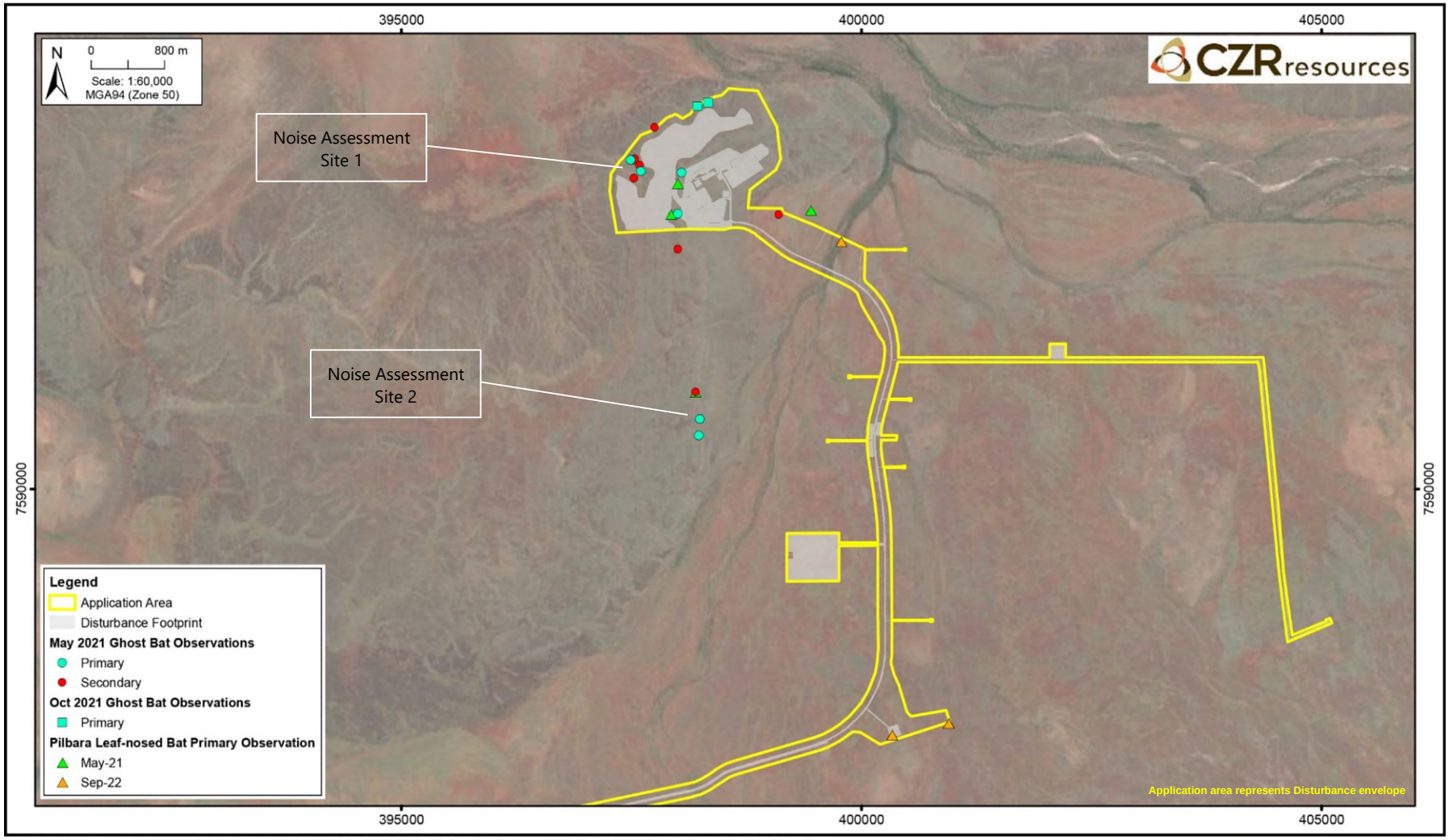
Locations in these two surveys were around the mesa, close to pools along drainage lines, at isolated rocky hills, on the plains and alongside a tree-lined dry creekbed. Very few records were obtained even when units were placed to a previously recorded maternity roost site, but this probably reflects annual variation in the use of that site.

In May 2021, there were single records on the flats, near a drainage line (upper end of Mungarathoona Creek), on both eastern and western sides of Mesa F, and outside a cave system previously identified as a maternity roost site. It was concluded that 'the cave structures within Mesa F appeared suitable for seasonal roosting Pilbara Leaf-nosed Bats,but were probably not suitable for maternity roosts. Pilbara Leaf-nosed Bat records were generally made late at night or about an hour before sunrise, suggesting the animals had travelled some distance from a roost site before they were detected'. Such usage would be consistent with the caves of the mesa serving as temporary nocturnal roosts outside the breeding season for the PLnB (nocturnal refuge – priority 4), although they may also be used by small numbers of animals as diurnal roosts (priority 3). The most likely location of priority 3 roosts would be in the western valley.

In September 2022 (Table 25 in BCE report, BCE 2024a), there were no records around the mesa, a single record along Mungarathoona Creek, and multiple records around the camp and particularly at the tree-lined dry creekbed in the south (Figure 32 of the BCE report, BCE 2024a). The timing of recordings at the creekbed (within 17 minutes of last light) suggests a moderately large roost (probably a maternity roost), probably in hills to the south (indicated by the lack of large numbers of records elsewhere in the project area at the time). An ARU set at the large valley in the east of the mesa detected no PLnB, and nor did an ARU set on an isolated hill nearby. While not conclusive, this suggests limited roosting activity during the breeding season in Mesa F at least at the time of the surveys. Thus, the caves may have limited value as impermanent roosts during the breeding season. As noted during the May 2021 investigations, the caves appeared to be shallow and to lack the depth and high humidity favoured by the species.

Overall, it would appear the PLnB roosts nearby and enters the project area to forage, and probably occasionally to roost in small numbers, particularly outside the breeding season. There will be buffer zones to protect the mesa edge and major drainage systems, and hydrological impacts will be minimised.

Figure 8.4.21 : Conservation significant bats observations



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8.4.4.6 Noise assessment

A noise assessment was undertaken by Lloyd George Acoustics (LGA 2023) to determine any noise impacts at the following locations:

- Site 1. A mesa edge location, to test the effectiveness of the pit setback from the mesa edge. At this site, a mock cave site was modelled, to compare noise levels at a cave entrance with levels 10 m inside the mesa edge (**Figure 8.4.21**).
- Site 2. The known Ghost Bat maternity roost, south of Project area (off the project tenement) (**Figure 8.4.21**).

Note, the noise assessment also included the mine village.

Predicted noise emissions were generated from proposed operations using computer noise modelling (*SoundPLAN 8.2*) and assessed against noise level limits in accordance with relevant criteria. Noise and vibration calculations regarding blasting were also undertaken to provide guidance for managing this activity close to the sensitive fauna receptors.

With no legislated noise criteria for fauna, noise levels were assessed based on relevant studies on the impact of noise on fauna. While the response to noise and vibration may vary among species (Busnel and Fletcher 1978), a study undertaken by Bullen and Creese (2014) suggests that sound levels up to 70 dB(A) are unlikely to result in Ghost Bats leaving their roost. As such a similar criterion was applied to the test sites when assessing the operational noise at the Robe Mesa Project.

To simulate the worst-case scenario, a mobile plant was modelled at the western edge of the 50 m buffer zone, closest to the Site 1 test site. The noise modelling at operations was demonstrated to comply with the fauna site criteria level of 70 dB(A) at both the mock 'cave entrance' and 'interior' at Site 1. Compliance at the known Ghost Bat maternity came and the village south of the operations is also demonstrated (**Table 8.4.8**, **Figure 8.4.22**).

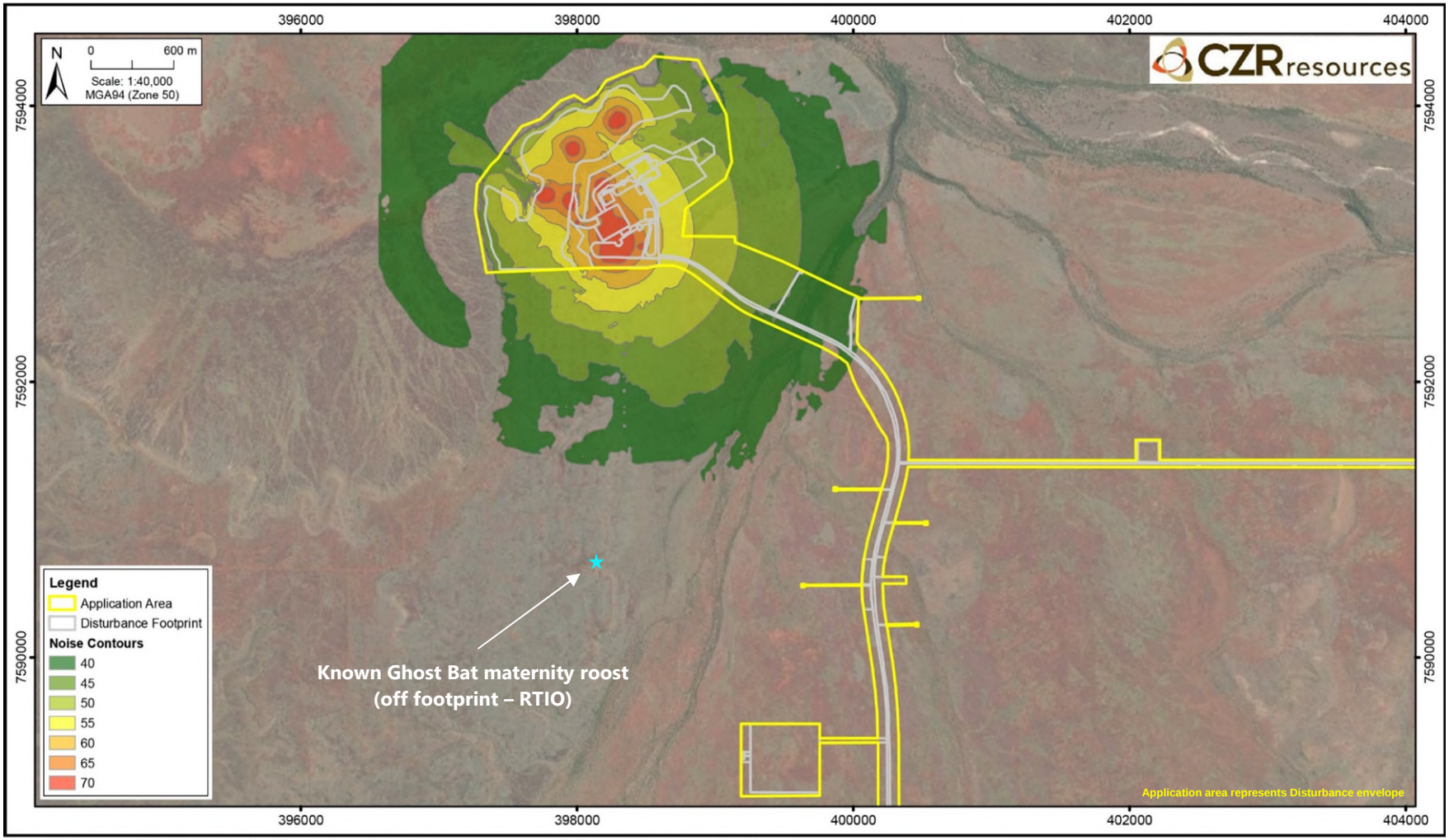
The noise levels from the Haul truck fleet have been predicted. At the nearest point, the haul route passes within 800 m of Village accommodation, and it is estimated that 6 truck passes will occur per hour (3 loaded and 3 empty). The noise modelling demonstrates that compliance at Ghost Bat sites and the mine worker village is achieved with respect to noise from truck haulage.

Table 8.4.8 : Predicted external noise levels, mining operations

Location	Predicted level		Limit Level	Compliance
	Operations (dB LA10)	Haulage fleet, dB LAeq		
Site 1. Mesa edge test site (simulating a cave entrance location)	55	17	70 dB(A)	Complies
Site 1. Mesa edge test site (simulating internal cave location)	45	17	70 dB(A)	Complies
Site 2. Known GB Maternity Bat site (~2 km south of Project area – off footprint)	18	22	70 dB(A)	Complies
Robe Mesa Project Village	28	37	*55 dB(A)	Complies

*Based on an internal level of 40 dB(A), a 15 dB(A) reduction is assumed when estimated noise internally

Figure 8.4.22 : Mining operations noise contours (dB LA_{10})



Drawn: CAD Resources (08 9246 3242), Date: Jun 2023, CAD Ref: a2967_F001_20, Rev: A ~ Imagery: ESRI, Maxar (Oct 2021) ~ Noise: Lloyd George Acoustics

The noise assessment undertaken by Lloyd George Acoustics (LGA 2023) determined noise impacts at the mesa edge and the known Ghost Bat maternity roost site south comply with relevant criteria and studies (Bullen and Creese 2014), with noise impact contours not extending to the maternity roost site.

Noise modeling at operations and haulage was demonstrated to be well below the site criteria level of 70dB.

Sites at the mesa edge, setback just 50 m from operations (worst case scenario), found noise emission predictions to be in the range between 45 and 55bB during operations. Note, there is no roost identified in this location, the site was selected as a typical mesa edge, where foraging may occur. The No Go mesa edge setback will use a 50m set back distance as a minimum, with up to 200-300m setback in some areas from the mesa edge.

Noise emissions at the known maternity Ghost bat roost, which is off tenement (RTIO) and more than 2 km south of the Project area, are predicted to be between 18 and 22 dB for operations and haulage respectively (LGA 2023). These levels are extremely low, well under any exceedance threshold and are comparable to current background levels (**Figure 8.4.22**).

8.4.4.7 Noise impact review

In a review of potential mining activity impacts at a nearby mine, Biota (2014) sought the opinion of nationally recognised bat zoologist Sue Churchill and Western Australian bat specialist Bob Bullen to obtain their independent views on likely impacts, changes to behaviour and the extent to which light (and noise) may impact the persistence of a Pilbara leaf-nosed bat colony.

Churchill noted in the Biota (2014) report, that although there is potential for noise to disturb roosting bats, it is unlikely to affect foraging bats. Note, the maternity roost recorded in **Figure 8.4.22**, is over 2 km from the mining operation, with only foraging activities recorded closer to the Robe Mesa Project. Churchill also noted that Pilbara leaf-nosed bats typically spread out and forage in all directions from their roost and are easily capable of flying around a noise disturbance on route to a water supply (pers comm, 14 February 2014). Furthermore, given that Pilbara leaf-nosed bats have a generalised and flexible foraging and commuting route, it is likely that they would modify their routes in response to adverse noise disturbance.

Bob Bullen noted that increased noise levels may affect bat physiology or behaviour, but noted that there is potential for Pilbara Leaf-nosed bat to become habituated to noise depending on the changes in noise level (Bat Call WA opportunistic observations). However, Bullen noted that no empirical evidence is currently available to support these views.

Preliminary data collected by Specialised Zoological (2010, 2012) (in Biota 2014) also suggests a lower sensitivity to noise and vibration, with Pilbara Leaf-nosed bat activity at one site (at Eastern Ranges) not reduced from baseline levels following the construction and operation of a haul road and a primary crusher within 500 m. Note, the known maternity roost is at least 2 km from the mining operations at the Robe Mesa Project area.

8.4.4.8 Light impact review

Light spill will be novel to the landscape and has been demonstrated elsewhere to result in large scale invertebrate mortality and an increase in the abundance of native predators.

In a Biota (2014) review of impacts to Pilbara Leaf-nosed Bats, it was noted by Sue Churchill (specialist opinion) that lights are unlikely to adversely affect Pilbara Leaf-nosed Bats during foraging. In fact artificial lighting is likely to attract insects thereby allowing Pilbara Leaf-nosed Bats to exploit the higher than normal concentrations of prey. Churchill surmised that these bats are opportunistic foragers and are not constrained in their dispersal routes or foraging patterns. They have only a generalised foraging route and they modify this on a nightly basis depending on the availability of food and water. It is therefore likely that they would modify their foraging and commuting routes in response to adverse light disturbance.

Bob Bullen (specialist) believed that there is potential for Pilbara Leaf-nosed Bats to be attracted to artificially lit areas (Norm McKenzie pers. comm and Bat Call WA personal observations) (in Biota 2014). Increased insect activity near lights may in turn result in the attraction of Pilbara Leaf-nosed Bats due to increased availability of prey. Opportunities Observations noted by Bat Call WA found a potential for Pilbara Leaf-nosed Bats to become habituated to light, with bats noted as hunting in artificially lit areas, indicating that they have become used to the presence of light.

CZR is aware of the National Light Pollution Guidelines for Wildlife (DCCEEW 2023), which aims to ensure that artificial light does not disrupt within, or displace from, important habitat, or impact critical behaviours such as foraging, reproduction and dispersal.

DCCEEW (2023) prescribes best practice lighting design principles, which will be considered and incorporated during the detailed design phase:

1) Start with natural darkness and only add light for specific purposes.
2) Use adaptive light controls to manage light timing, intensity and colour.
3) Light only the object or area intended – keep lights close to the ground, directed, and shielded to avoid light spill.
4) Use the lowest intensity lighting appropriate for the task.
5) Use non-reflective, dark-coloured surfaces.
6) Use lights with reduced or filtered blue, violet and ultraviolet wavelengths.

Key management measures described by DCCEEW (2023) will also be considered and incorporated where possible. The most effective measures for mitigating the impact of artificial light on bats, in general, include:

- maintaining dark refuge sites
- avoiding, removing, redirecting or shielding artificial lights in foraging areas and along commuting routes
- keeping artificial light intensity as low as practicable, noting that low-intensity artificial light (comparable to full moon light levels) can disrupt behaviour of bats.
- Implement appropriate mitigation where and when bats are likely to be present.
- Avoid artificial light directed onto roost sites and indirect spills into roosts.
- Direct artificial light downwards and/or shield luminaires near foraging areas and commuting corridors.
- Maintain darkness along commuting corridors and between roosts, water sources and foraging areas

8.4.4.9 Buffers and setbacks

Bullen (in Biota 2014) notes that the persistence of Pilbara leaf-nosed Bat records close to active mine areas offers circumstantial evidence that, at certain levels of mining-related disturbance, the occurrence and foraging behaviour of Pilbara leaf-nosed Bat may not be adversely affected (Specialised Zoological 2010, 2012, Biota 2013c, 2014), with available data demonstrating that Pilbara leaf-nosed Bat have been recorded close to active mines (to within 40 m).

Furthermore, in a 2013 blasting trial, Biota (2013a) found very little evidence that any disturbance behaviour detected that could be associated with the trial blasts. Only three of the 51 calls recorded were concurrent with blast timing and all represented single individuals. Even if some bats took flight but were not detected, the results still imply that the great majority of the colony was not disturbed even by the strongest blast at 12.2 mms-1 (Biota 2013a). There was no evidence detected that blasting significantly disturbed the colony as a whole to the point where most or all bats took flight within the cavern during daylight hours. Most daylight calls that were recorded appeared to be associated with the installation and set up of equipment during the trial and download of data following blasts. This is consistent with past observations (Biota 2012), which suggest

human or other disturbance directly within the cavern may be more significant than vibration levels generated by the simulated production blasts in this study. Call data from long-term monitoring units found that activity on the evenings of the two-day blasting trial was in keeping with normal baseline levels. The data also demonstrated that activity following the trial was within baseline range, indicating no ongoing effects of the trial on the colony after its completion

As stated previously, the mesa edge buffer at the Robe Mesa Project will use a minimum 50m set back distance, with up to 200-300m setback in some areas (**Figure 8.4.23**). Based on previous studies summarised above, and CZRs impact assessment of noise at the Robe Mesa Project, and recommended light mitigation strategies from DCCEEW (2023), noise, vibration and light impacts on bats foraging at the mesa edge is expected to be very low.

Figure 8.4.23 : Mine pit setback at the Robe Mesa Project

8.4.4.10 Pilbara Olive Python

This species is considered likely a resident of the project area.

The DBCA threatened database search identified 24 records within the surrounding area. The majority of these records lie further east along the Robe River with the nearest being 5km from the project area. The Rio Tinto Mesa H report (2019) documented an additional six along the Robe Valley including one record at the northern stretch of Mungarathoona Creek at a permanent waterhole which is located within 300 metres of the project area. Biological surveys undertaken by environmental consultants have recent records within the vicinity at Mesa H (Astron 2016), Bungaroo (Astron 2016a) Middle Robe/East Deepdale (Astron 2016b) and Yarraloola

(Biologic 2014). While the species was not detected during field investigations, the species is almost certainly present as a resident. The major watercourses (such as Mungarathoona Creek just east of the mine area and Warramboo Creek at the southern haul road route) provide suitable habitat, and rocky areas including the mesa of the mine area may be used for shelter during the cooler months.

Threats to the Pilbara Olive Python are primarily associated with vehicle strike in preferred habitat areas such as mesa edges and drainage lines. Mitigation measures include managing traffic frequency and speed and establishing underpasses that direct Pilbara Olive Pythons between preferred habitats whilst avoiding direct road crossings. Management actions to minimise the risk of impacts to the Pilbara Olive Python are described in Section 9 (risk assessment) and Section 10 (outcomes and monitoring).

8.4.4.11 Night Parrot

The Night Parrot is considered to be only a vagrant in the area. This was due to the lack of suitable habitat as described in the DBCA (2024) guidelines for the species; so this was considered but not made clear. The guidance describes at length the need for roosting and foraging habitat.

Roosting habitat (spinifex; often long unburnt) was present and widespread, with some areas long unburnt, but such an environment can be found across vast tracts of the country. Foraging habitat is more likely to be limited, and consists of species-rich grasslands and herbfields often associated with paleo-drainage systems. Such landscapes do not occur in the project area or nearby. This is not to say the Night Parrot could never be present, hence the conclusion that it might occur as a vagrant. The definition of 'vagrant' used by BCE is a 'species that occurs within the project area unpredictably, in small numbers and/or for very brief periods. Therefore, the project area is unlikely to be of importance for the species'.

8.4.5 Subterranean Fauna

Information in this section is based on the following supporting studies:

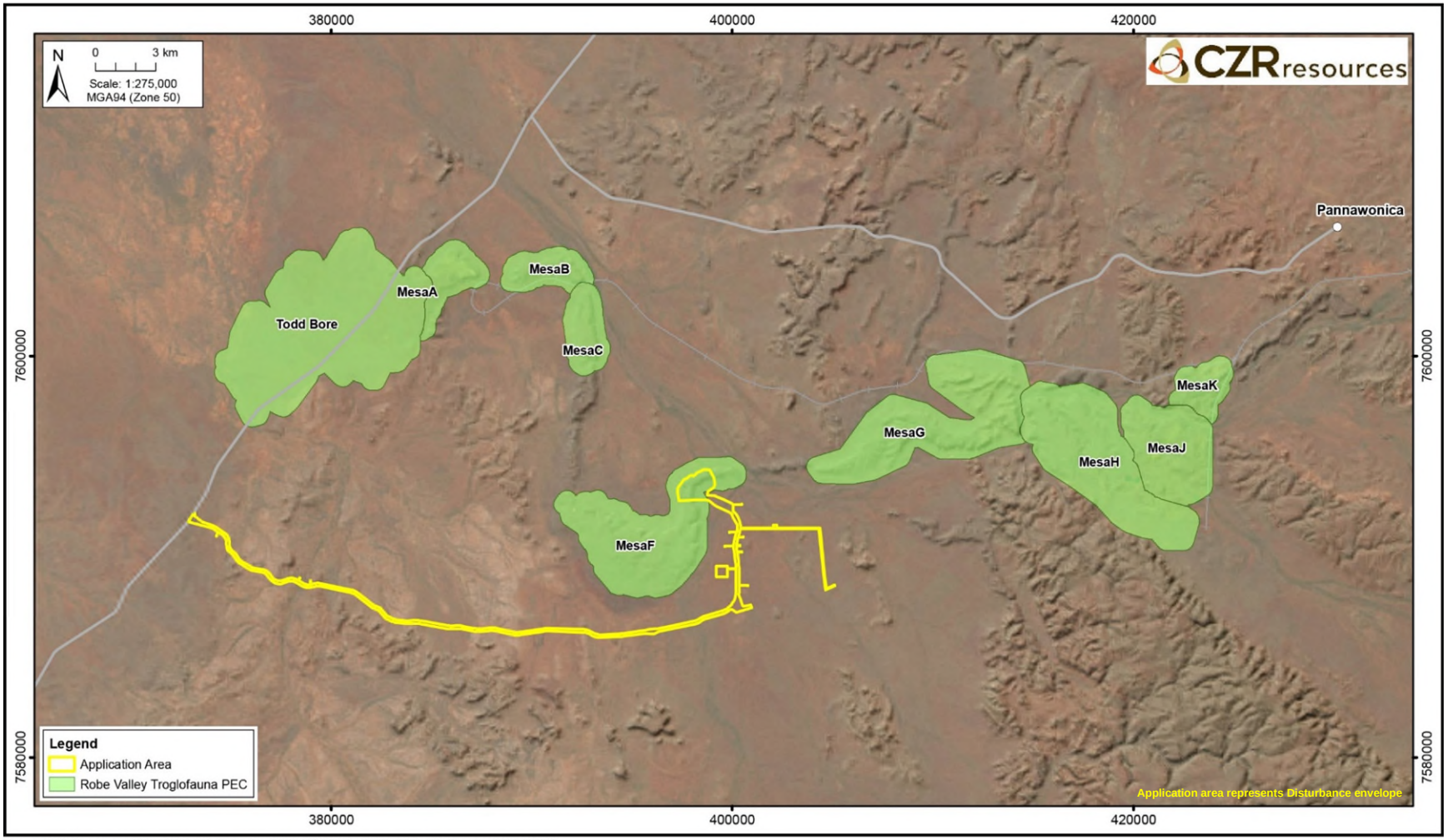
- Biota Environmental Sciences (Biota) (2023c) Robe Mesa Troglofauna Baseline Assessment Report (Appendix 8-7)
- CZR (2023) Work Completed for the Review of Troglofauna Habitat at Robe Mesa (Appendix 8-8)
- Biota Environmental Sciences (Biota) (2024a). Robe Mesa Project Troglofauna habitat. Summary Memo Report based on a DEMIRS request for further information on troglofaunal habitat.
- Biota Environmental Sciences (Biota (2024b). Addendum to Biota (2023c). Troglofauna phase 3 sampling results and analysis.

8.4.5.1 Priority Ecological Community (PEC)

The project area mesa forms part of the State-listed PEC - 'Subterranean invertebrate communities of mesas in the Robe Valley region' (**Figure 8.4.24**).

The Priority Ecological Community (**PEC**) is categorised by the Department of Biodiversity, Conservation and Attractions (DBCA) as Priority One: "Poorly-known ecological communities, which are known from very few occurrences with a very restricted distribution (generally ≤5 occurrences or a total area of ≤ 100 ha). Occurrences are believed to be under threat either due to limited extent, or being on lands under immediate threat (e.g., within active mineral leases) or for which current threats exist. Communities may be included if they are comparatively well-known from one or more localities but do not meet adequacy of survey requirements and/or are not well defined and appear to be under immediate threat from known threatening processes across their range".

Figure 8.4.24 : Robe Valley subterranean fauna PEC and local mesa formations



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8.4.5.2 Overview of Receiving Environment

Biota (2023, 2024b) were commissioned to undertake subterranean assessments of the Project area, largely based on their extensive experience in sampling and identifying troglofauna across the Robe Valley over the last 20 years. Given the known significance of the Robe valley for troglofauna, the project tenure was sampled in accordance with current EPA technical guidance for subterranean fauna (EPA 2021).

Three phases of sampling for troglofauna have been completed in the CID mesa landform of the project area, also in accordance with EPA technical guidance for subterranean fauna surveys (EPA 2021). A total of 102 troglofauna specimens were collected from 22 drillholes across the three phases of sampling completed within the project tenure. The range of higher taxonomic ranks recorded are typical of the troglofauna assemblage recorded in other mesas in the Robe valley (Biota 2023).

DNA sequencing has been completed for the specimens from all three phases of sampling to assign species identifications (Biota 2024a and 2024b) The sequenced specimens from the project tenure are genetically distinct from similar specimens recorded at other mesas in the Robe Valley. This corroborates previous studies that demonstrate that mesas in the Robe Valley are habitat isolates, and there is no gene flow between mesas.

At least 17 species from seven orders have been recorded in the last 3 phases on sampling (Biota 2024b) (**Table 8.4.9** and **Figure 8.4.25**).

Seven of the 17 species have only been recorded within the project mine pit (Biota 2024b). Only one of the 17 species, the pseudoscorpion *Indohya alexanderi*, has been recorded from another nearby mesa. Considering the Robe Valley troglofauna have been extensively surveyed over the past 15 years and are well represented in genetic databases, it is evident that the troglobitic community recorded during the survey is essentially endemic to Mesa F.

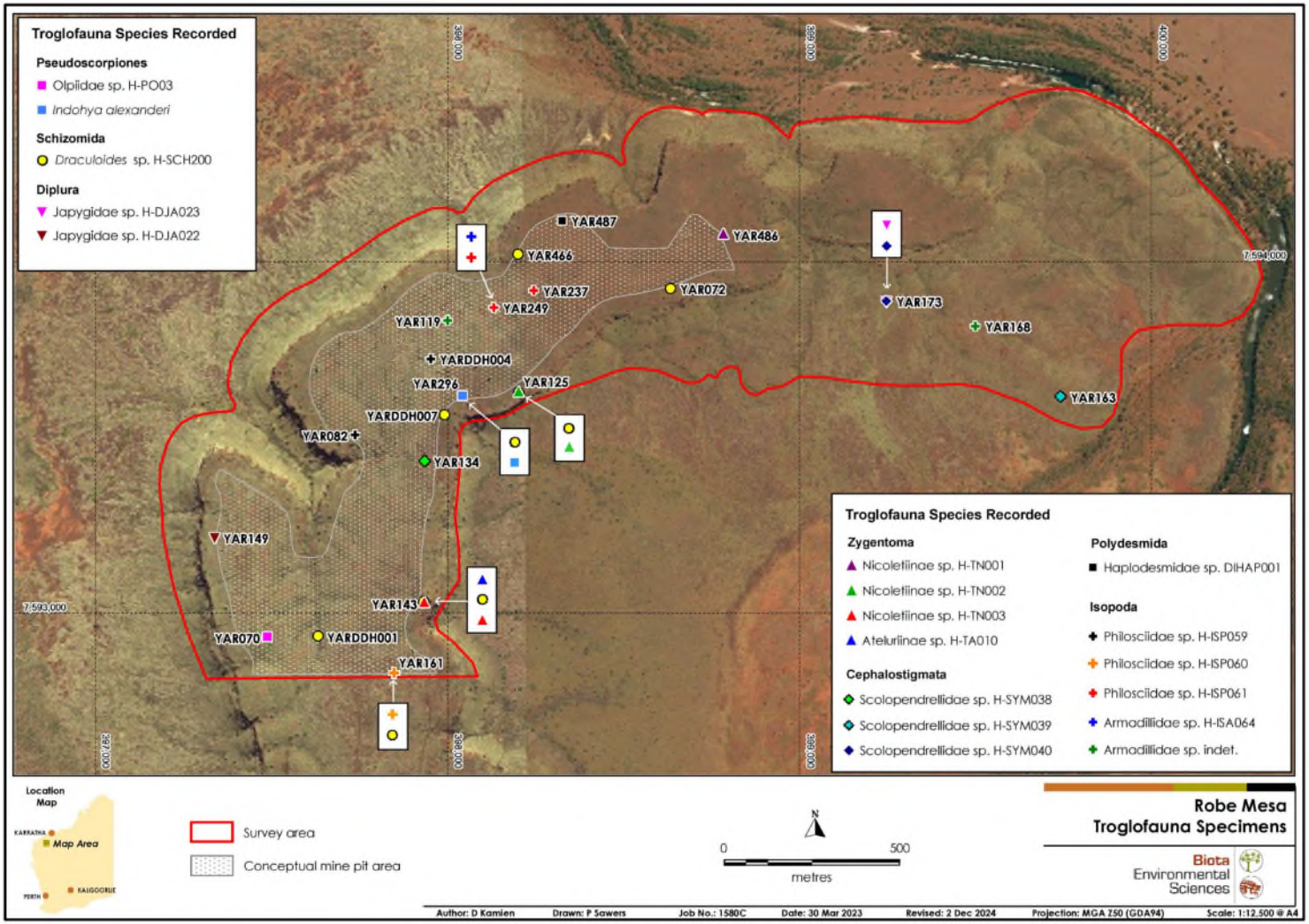
Two specimens, *Draculoides* sp. H-SCH200 and *Armadillide* sp. H-ISA064, are recorded both inside and outside the conceptual pit. Other species, *Japygidae* sp. H-DJA023, *Scolopendrellidae* sp. H-SYM039 and *Scolopendrellidae* sp. H-SYM040, are found outside the mine pit, but in connected CID in the vicinity of the Disturbance footprint (i.e. within the same CID habitat).

Geological modelling (CZR Resources 2023) and extensive subterranean fauna research completed in the region (Biota 2023a), indicates that similarly suitable habitat is likely to occur throughout Mesa F, which is contiguous with that of the Robe Mesa Project area (Biota 2006, 2011b). It is therefore very likely that the species recorded during the survey would also occur throughout Mesa F. Data from other extensively sampled mesas in the locality demonstrate the same patterns, with any given species typically occurring across the extent of each mesa landform (Biota 2006, 2011b). The recorded locations of *Draculoides* sp. H-SCH200 and *Armadillidae* sp indet both inside and outside the conceptual pit further support this argument. It is also possible that collections of unsequenced *Draculoides* sp. nov. 'Mesa F'.2, *Japygidae* sp. and *Armadillidae* sp. obtained from previous surveys at Mesa F (Biota 2006, 2011b), represent the same species as those recorded during the current survey (Biota 2023a).

It is therefore very likely that the species recorded from the project tenure, and those apparently only occurring within the pit outlines, would also occur throughout Mesa F. This would be entirely consistent with the findings demonstrated for all other CID mesa landforms in the Robe valley where longer-term sampling has better documented the fauna.

Table 8.4.9 : Troglobitic fauna recorded within the conceptual pit outline (Biota 2024b)		
Taxon	**Sites**	**Significance**
Olpiidae H-PO03	YAR070	Confirmed SRE species
Scolopendrellidae sp. H-SYM038	YAR134	Confirmed SRE species
Philosciidae sp. H-ISP059	YAR082, YARDDH004	Confirmed SRE species
Philosciidae sp. H-ISP060	YAR161	Confirmed SRE species
Philosciidae sp. H-ISP061	YAR237, YAR249	Confirmed SRE species
Armadillide sp. H-ISA064	YAR249	Confirmed SRE species
Haplodesmidae sp. DIHAP001	YAR487	Confirmed SRE species
Olpiidae H-PO03	YAR070	Confirmed SRE species

Figure 8.4.25 : Trogolofauna species recorded from the Robe Mesa Project



8.4.5.3 Troglofauna habitat characterisation

A detailed assessment of troglofauna habitat has been modelled by CZR (2023), building on similar work by API Management (APIM), for the West Pilbara Iron Ore Project (WPIOP) Stage 1 Deposits (APIM 2015) and with technical assistance from Red Hill Resources.

Troglofauna habitat is primarily a function of available space, maintenance of a constantly high humidity and the potential for nutrient input from surface systems (Humphreys 1991, Wilkens et al. 2000, Biota and DC Blandford & Associates 2013).

Robe Valley mesas are frequently vuggy, fractured and often contain small-scale caverns, which allow for percolation of water and nutrients from surface habitats, thereby representing suitable habitat for subterranean fauna (Biota 2006, 2011b, 2016a) (**Figure 8.4.26**).

The gradual isolation of mesa landforms in the Robe Valley through the dissection and erosion of Robe Pisolite paleochannels has been occurring for 10 million years ago (Ramanaidou et al. 2003), which has led to the formation of unique troglobitic communities within each disconnected mesa (Biota 2006, Harvey et al. 2008, Biota 2011b, 2016a).

Stratigraphically, the Project area comprises two channels of pisolitic ironstone (CZR Resources 2023) with the conceptual pit outline is located predominately within the Robe Pisolite upper CID (**Figure 8.4.27** and **Figure 8.4.28**).

Locally, the Robe Mesa (located within the broader Mesa F landform) preserves two channels with well-formed CID iron ore mineralisation (MCU and MCL) both of which are enveloped by a transitional unit which is mineralised but less sorted and lower in Fe grade (MMU and MML). The mineralised channels are separated by an interstitial waste unit which is characterised by sandy ironstone rocks and clay rich lenses. Directly underlying the lower mineralised channel is a thin ferruginous silty ironstone unit above a clay rich basement rock.

Each stratigraphic unit provides a different level of troglofaunal habitat value (Biota 2023c) (**Table 8.4.10**).

The basal rock units underlying the lower pisolitic channel (WIB and WCB units) have been determined to not represent main troglofauna habitat, due their high clay content, lack of vuggy structure and position underneath the recorded water table. The interstitial waste units which separate the upper and lower pisolitic channel are also not considered to be main troglofauna habitat, though they may fulfill a function in maintaining humid microclimates through impeding water penetration and storing recharge within the structure. This is primarily due to the increased clay content and absence of well mineralised, vuggy rock texture.

Figure 8.4.26 : Diamond core of CID-upper layer depicting vugs and fractures (CZR 2023)

Figure 8.4.27 : Typical schematic cross section of the Robe Mesa Project (CZR 2023)

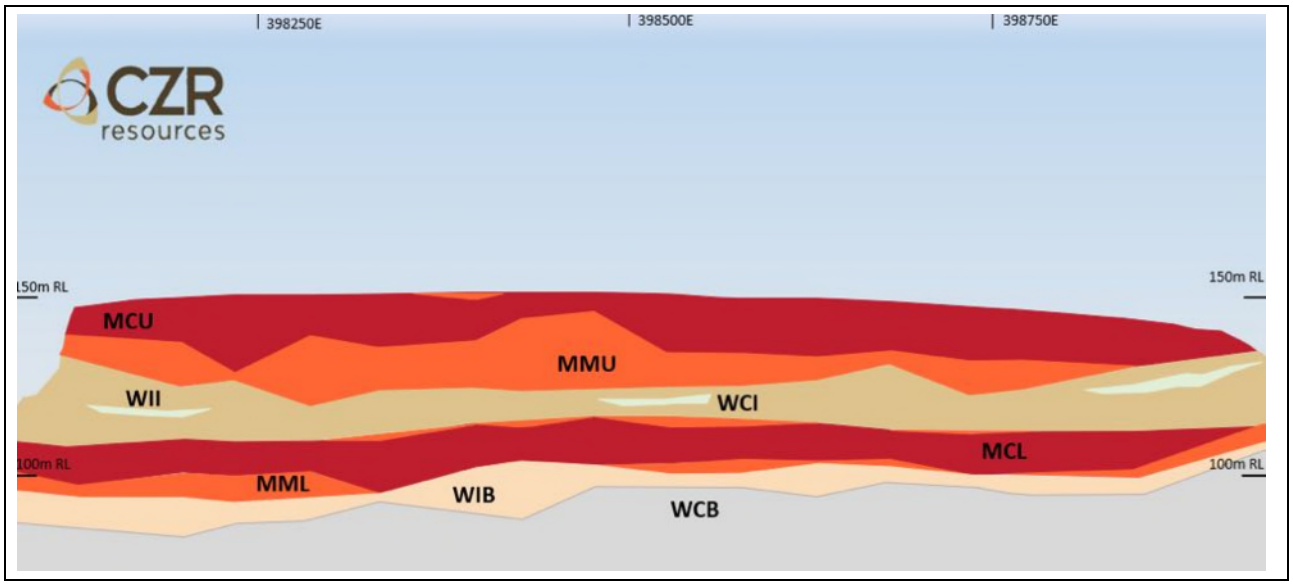


Figure 8.4.28 : Typical schematic cross-section indication nominal pit design (CZR 2023)

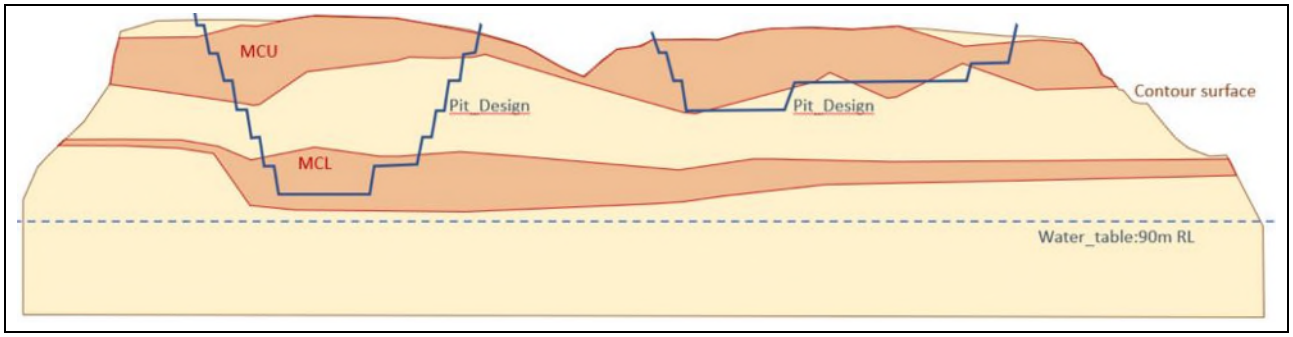


Table 8.4.10 : Robe Mesa Project stratigraphy

Geology Code	Unit Name	Description	Habitat Suitability Characteristics*
MCU	CID – upper	Pisolitic ironstone - strongly mineralised	High
MMU	Mixed zone – upper	Pisolitic ironstone - poorly sorted	High
WII	Interstitial waste	Sandy ironstone with some mixed pisolite	Low
WCI	Interstitial clay	Clay rich lenses within interstitial waste	Low
MCL	CID – lower	Pisolitic ironstone - strongly mineralised	High
MML	Mixed zone - lower	Pisolitic ironstone - poorly sorted	High
WIB	Silty ironstone-basal	Clay rich ironstone	Low
WCB	Basal clay	Claystone basal unit	Low

*Based on advice from Biota Environmental Sciences

8.4.5.4 Habitat volumes

To quantify the habitat volumes from Robe Mesa, 3D-wireframining was employed to create solids which represents the geological units representing troglofauna habitat (CZR Resources 2023). The abundant downhole drill data at Robe Mesa allowed for accurate geological contacts to be modelled and the pit design provided by Snowden Optiro was used to refine the solids so they accurately represented the volumes which would be removed by proposed mining activity. Using some high-level assumptions, the geological units from Robe Mesa were able to be projected across the Mesa F landform, so that the true extent of contiguous Troglofauna habitat could also be assessed (**Table 8.4.11**).

Outcomes from 3D habitat modelling for the CZR managed portion of the Mesa F landform (M08/533):

- The residual habitat remaining in M08/533 after proposed mining is~33,000,000 bcm, which represents 68% of the pre-mining habitat volume in M08/533.
- Habitat impact is much less in the lower CID units, ~87% of the habitat remaining post mining in M08/533.

Outcomes from 3D habitat modelling for the entire contiguous habitat of the Mesa F landform:

- The total troglofauna habitat volume for the entire Mesa F landform is ~452,400,000 bcm, of which the habitat of M08/533 represents ~10% of this contiguous landform.
- The proposed mining volume for the Robe Mesa Project, ~15,500,000 bcm, represents 3.5% of the total contiguous troglofaunal habitat within the Mesa F landform.

Table 8.4.11 : Troglofauna habitat volume determination results from 3D modelling (wireframing)

Geological unit	Pre-Mining Troglofauna Habitat volume (bcm)	Proposed volume of Troglofauna habitat removed for Robe Mesa Project (bcm)	Post Mine Trog Habitat volume (bcm)	Proportion of Trog habitat remaining post mine (%)
Robe Mesa Project Tenure (M08/533)				
MCU	14,556,666	8,314,862	6,241,804	42.9
MMU	7,336,353	3,635,652	3,700,701	50.4
MML	5,964,179	595,314	5,368,865	90.0
MCL	20,993,787	2,962,026	18,031,761	85.9
Total	*48,850,985*	*15,507,854*	*33,343,131*	*68.3*
Robe Mesa and Mesa F landform				
MCU	153,427,263	8,314,862	145,112,401	94.6
MMU	67,947,034	3,635,652	64,311,382	94.6
MML	37,368,049	595,314	36,772,735	98.4
MCL	193,715,073	2,962,026	190,753,047	98.5
Total	*452,457,419*	*15,507,854*	*436,949,565*	*96.6*

8.4.5.5 Proposed habitat loss and fragmentation

As outlined above, while it is unlikely that any species of troglofauna would be restricted in distribution to the proposed pit area, questions have been raised in regard to the effect of habitat fragmentation and proportional habitat loss from Mesa F, of which the project tenure forms part.

It must be recognised in any such consideration that troglofauna occur in a three-dimensional environment (Biota and DC Blandford & Associates 2013). This means that while a planar, two-dimensional view such as a map is helpful to conceptualise impact footprints, the most informed assessment is provided by considering volumetric change to the mesa landform and the CID strata as a whole.

In the case of the Robe Mesa project, this indicates that troglofauna habitat removal for the proposed pit would represent:

- 13% of the available habitat within the project tenure by volume; and
- 3.5% of the estimated total habitat present within the entire Mesa F landform.

Even at initial assessment, the loss of 3.5% of the habitat of an ecological community would appear unlikely to represent a significant impact. Further; for context on past EPA advice to the Minister for the Environment on similar Robe valley projects, the loss of up to 50% of the habitat of a mesa was deemed acceptable (EPA 2007), provided that the persistence of troglofauna in the retained habitat could be demonstrated. Conditioned monitoring that has been conducted for these past approved projects has indeed demonstrated this, yielding data to support both maintenance of key habitat parameters and the ongoing persistence of troglofauna species in retained portions of mined mesas (MWH 2014, Biota 2019b, 2020a). Given these observations, it would seem to be an acceptably low risk that the relatively small loss of 3.5% of the troglofauna habitat would lead to any significant impact on the subterranean biodiversity values at Mesa F.

Similarly, habitat fragmentation does not appear to be a credible impact pathway. This too must consider the three-dimensional habitat perspective and that the proposed pit would still leave a surrounding margin of connected habitat on the mesa edge that is also vertically connected to underlying CID strata below the pit floor. Such connections have been shown to continue to support troglofauna during mining operations in the Robe valley (Biota 2020b). These observations suggest that the likelihood of fragmentation significantly affecting the troglofauna of Mesa F is also low.

8.4.6 Short Range Endemics

Information in this section is based on the following supporting studies:

Biota (2022) Robe Mesa Project Short-range Endemic Invertebrate Fauna Survey. (Appendix 8-9)

The targeted survey for potential SRE invertebrates was conducted in June 2022 for the road and infrastructure sites by Biota (2022), as well as the mine area in May 2021, July, and September 2022 by BCE (2023, 2024a). All SRE surveys were conducted in accordance with EPA technical guidance for sampling shore range endemic invertebrate fauna (EPA 2009).

Survey methods included habitat assessment, 124 person hours dedicated to SRE fauna searches at 44 sites and molecular sequencing (DNA barcoding) to identify specimens to species level.

Four broad fauna habitats were identified in the survey area:

- River/Flood Plains;
- Alluvial Plains;
- Colluvial Plains;

- Mesa tops and
- Low Stony Hills.

All SRE habitats were common in the locality, being contiguous between the survey area and surrounds.

Specimens were collected from two taxonomic groups that have a higher potential to contain SRE species; mygalomorph spiders (eight taxa) and land snails (two taxa).

Of the 10 nominal SRE species recorded, six of the mygalomorph spider taxa are potential SREs known solely from the survey area. However, the habitat attributes of the survey area and wider locality make it unlikely that these nominal species would be restricted to the survey area.

The findings for the land snail specimens were consistent with this, with the two species represented being confirmed as widespread and not SREs.

8.5 Hydrology

8.5.1 Surface Water

Information in this section is based on the following supporting studies:

- AQ2 (2021) CZR Robe Mesa – Preliminary Surface Water Modelling (Appendix 8-10)
- AQ2 (2022) Robe Mesa Study – Haul Road Surface Water Assessment (Appendix 8-11)
- AQ2 (2024a) Robe Mesa mine operations centre and haul road surface water modelling

8.5.1.1 Catchment and watercourses

Most of the Disturbance envelope is located within the surface water management area for the Robe River and its tributaries. The Robe River is a significant river system in the region and drains east to west through the high relief areas of the Hamersley Ranges, between Mesa formations on the Southern Peneplain and onto gently sloping coastal plain prior to discharging into the Ocean (Ruprecht, 2000 and Beard, 1975) (**Figure 8.5.1** and **Table 8.5.1**).

A portion of the proposed Access Road is located within the Onslow Coastal Plain, a predominantly flat area with little or no defined drainage channels. The Ashburton and Cane Rivers discharge onto the Onslow Coastal Plain and although maintaining some channel across the coastal plain, both rivers have diminished flow capacity and an increasing tidal influence as they approach the coast (Bussemaker and Brunner 2017).

Table 8.5.1 : Robe Mesa Project Catchments (DWER-028)

Catchment	Survey extent (ha)	Disturbance envelope and proportion of survey extent		Disturbance footprint and proportion of survey extent	
		ha	%	ha	%
Robe River Catchment	758,253	541	0.07	197	0.03
Coastal Plain Catchment	424,037	361	0.09	72	0.02

Creeks in the region are ephemeral with runoff responding to the sporadic significant rainfall events.

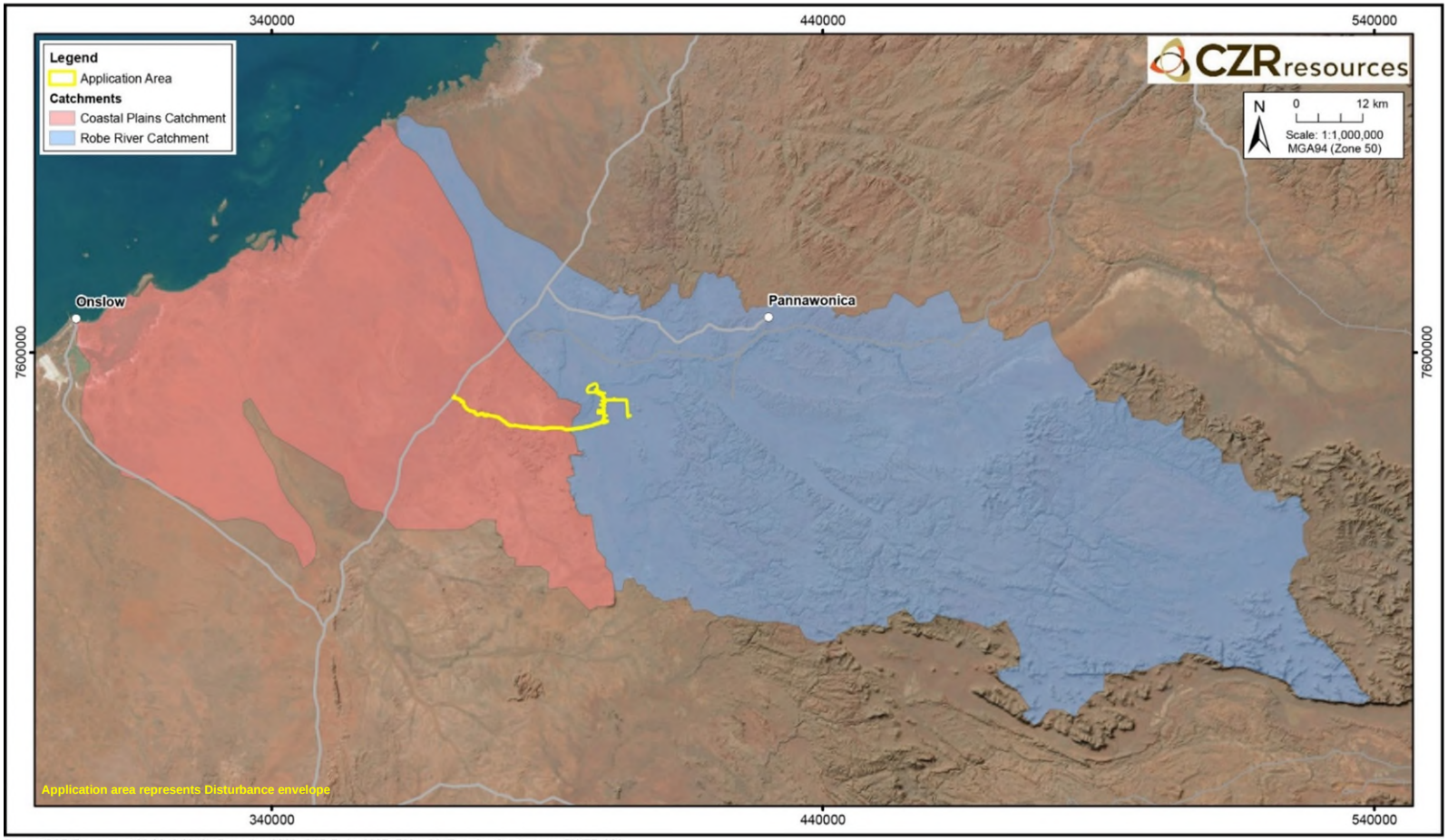
Mungarathoona Creek, one of the major Robe River tributaries, flows through the main Project tenement area from south to north and around the northern part of the Robe Mesa. The confluence of Mungarathoona Creek and Robe River occurs directly north of the Disturbance envelope (approximately 1.8km northeast) and has resulted in a series of river pools at the junction (**Figure 8.5.2**).

Unnamed Pool is approximately 1000 m northeast of the project and Robe Pool and Chalyarn Pool are approximately 1,600 m and 2,100 m further east of the mine area respectively.

There are no Ramsar Wetlands in the Disturbance envelope, with the closest Ramsar Site located approximately 440 km northeast (Eighty Mile Beach).

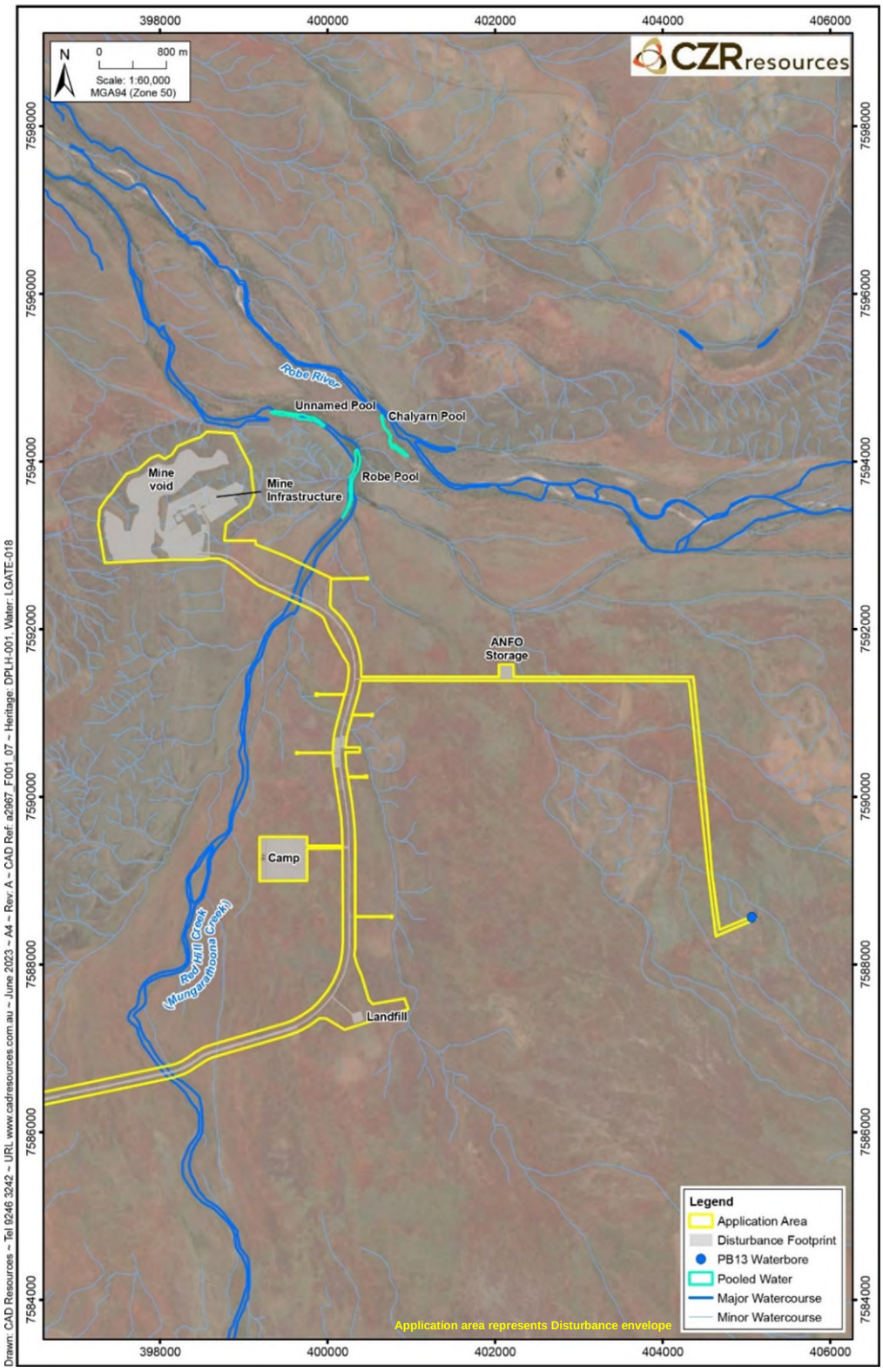
The closest significant wetlands (as listed on the Directory of Important Wetlands, DBCA-045) are located 125 km west (Exmouth Gulf East Wetlands) and 225 km east (Fortescue Marshes) of the Disturbance envelope.

Figure 8.5.1 : Catchments of the Robe Mesa Project



Drawn: CAD Resources (08 9246 3242), Date: Jun 2023, CAD Ref: a2967_F001_06, Rev: A ~ Catchments: DWER-028

Figure 8.5.2 : Watercourses and River pools of the Robe Mesa Project



8.5.1.2 Flood Modelling

Flood modelling by AQ2 (2021, 2024a), using hydraulic 2D flood modelling of Robe River and Red Hill Creek has been completed to estimate inundation of the Project area. The 2D flood model was developed using HEC-RAS V6.0.0 modelling software (AQ2 2021 and 2024a) and based on data from the Yarraloola gauging station (DWER station 707002, 2021b), 20 km downstream of the Project and at the North West Coastal Hwy crossing.

Flood Frequency Analysis of the Yarraloola gauging station flow data from 1989-2021 was used to estimate Robe River peak flows for various Annual Exceedance Probability (AEP) events (including the 1% AEP), as shown in **Table 8.5.2**. The 1% AEP event flood depth predictions from the pre-development model are shown in **Figure 8.5.3** and **Figure 8.5.4**, relative to the proposed infrastructure footprints. A velocity map is shown in **Figure 8.5.5** which provides an indication of areas subject to potential scour.

Table 8.5.2 : Robe River Peak flow estimates (m^3/s) (AQ2 2021 and 2024a)

Catchment	Annual Exceedance Probability (AEP)			
	10%	5%	2%	1%
Robe River –to Yarraloola	3,000 m^3/s	5,870	11,480	17,100

Key observations from the flood predictions (AQ2 2024a):

- The predictions indicate that during a 1% AEP flood event, the majority of the mine operations area has been positioned outside of the flood extents of Mungarathoona Creek, with a portion of the southeast section of this area may be prone to inundation during large flood events (**Figure 8.5.3)**.
- The Haul Road alignment between the process plant and the village (about 4km) is within the Mungarathoona Creek floodplain with flood inundation predicted to be above 0.5m (**Figure 8.5.4)**.
- The predicted inundation of the camp area and the camp area access road is predicted to be up to 0.5 m (**Figure 8.5.4)**.
- The maximum flood depth of the Robe River in the main channel to the northeast (through the gap in the mesas) is predicted to be about 8 m and in the nearby pools is up to 10 m.
- Within the planned disturbance areas, any inundation in the proposed mine operations area footprint (or flows against any flood protection bunding) is only predicted to be subject to low flow velocities (<0.5 m/s). The velocity where Mungarathoona Creek crosses the proposed road alignments is predicted to be in the order of 2.0 m/s (**Figure 8.5.5**).

Model results show key infrastructure areas have been placed in locations outside the floodplains of the major adjacent creeks or where flow depths are manageable (<0.5 m) (**Figure 8.5.6** and **Figure 8.5.7**). Where the floodplain extends over infrastructure footprints, the following flood mitigation measures will be considered:

- Mine operations centre – predevelopment flood levels are predicted to extend marginally over the lowest points of the plant footprint. Levelling the area for construction is likely to raise the footprint above the predicted flood levels.
- Camp area – potential inundation managed by a low flood protection bund around the perimeter of the camp.
- Road crossings – creek crossing have been designed as a combination of a flood way with culverts to provide some degree of trafficability in lower flow events (**Figure 8.5.8**).

Local runoff from the mesa to the north and west of the mine operations centre will be managed via a small scale flood protection bund that will direct upstream runoff around the infrastructure area and back to Mungarathoona Creek. Surface water flow within the infrastructure area will report to two sediment basins. The basins will be monitored for sediment loads and periodically cleaned as required, as part of wet season preparation (**Figure 8.5.9**).

Velocity maps generated from flood modelling (AQ2 2021 and 2024a) have shown that because inundation at the proposed Disturbance footprint will be avoided in most situations as infrastructure is generally outside the flood zone, the site is only predicted to be subject to low velocities (<0.5m/s), which will reduce the risk of erosion and downstream sedimentation (**Figure 8.5.7**).

Difference flood depth and velocity maps (post-development max values minus pre-development max values) are presented in **Figure 8.5.10** and **Figure 8.5.11** respectively. These figures indicate that the impact of the road on the predicted flood levels will be 0-5cm lower than baseline and velocities to be 0-5cm per second slower than baseline, therefore no material impact is expected on the Robe Pools.

Figure 8.5.3 : 1% AEP Pre-development flood mapping at the mine operations centre (AQ2 2024a)

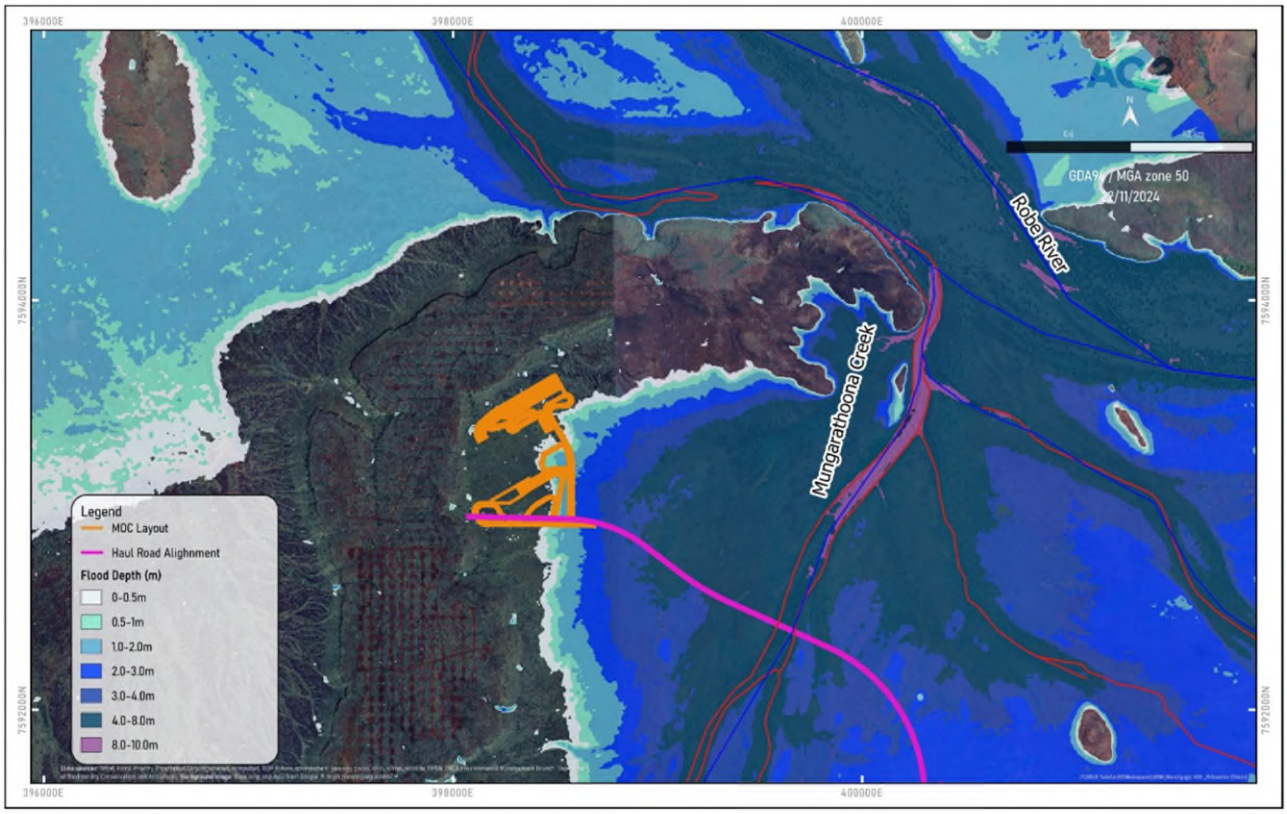


Figure 8.5.4 : 1% AEP Pre-development flood mapping at camp (AQ2 2024a)

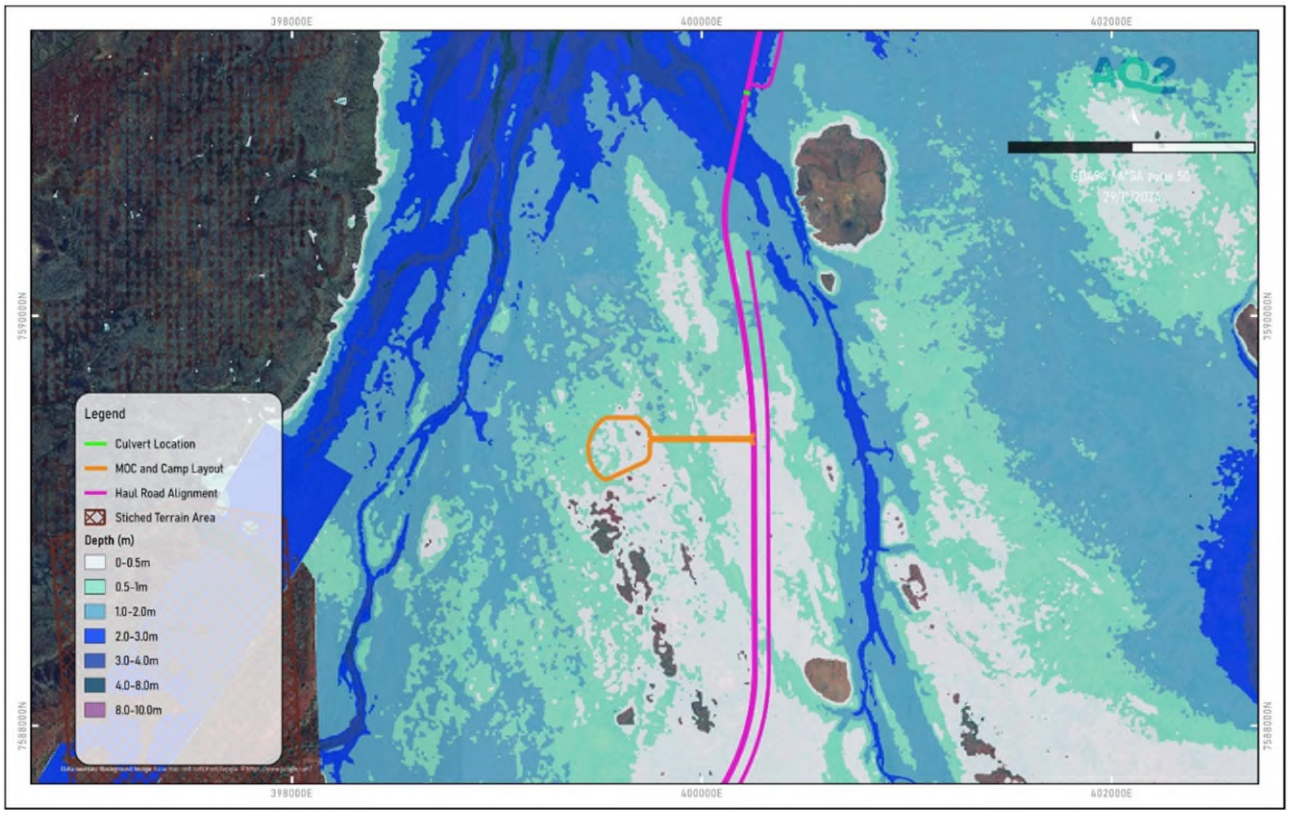


Figure 8.5.5 : Baseline Flood Velocity 10% AEP (AQ2 2024a)

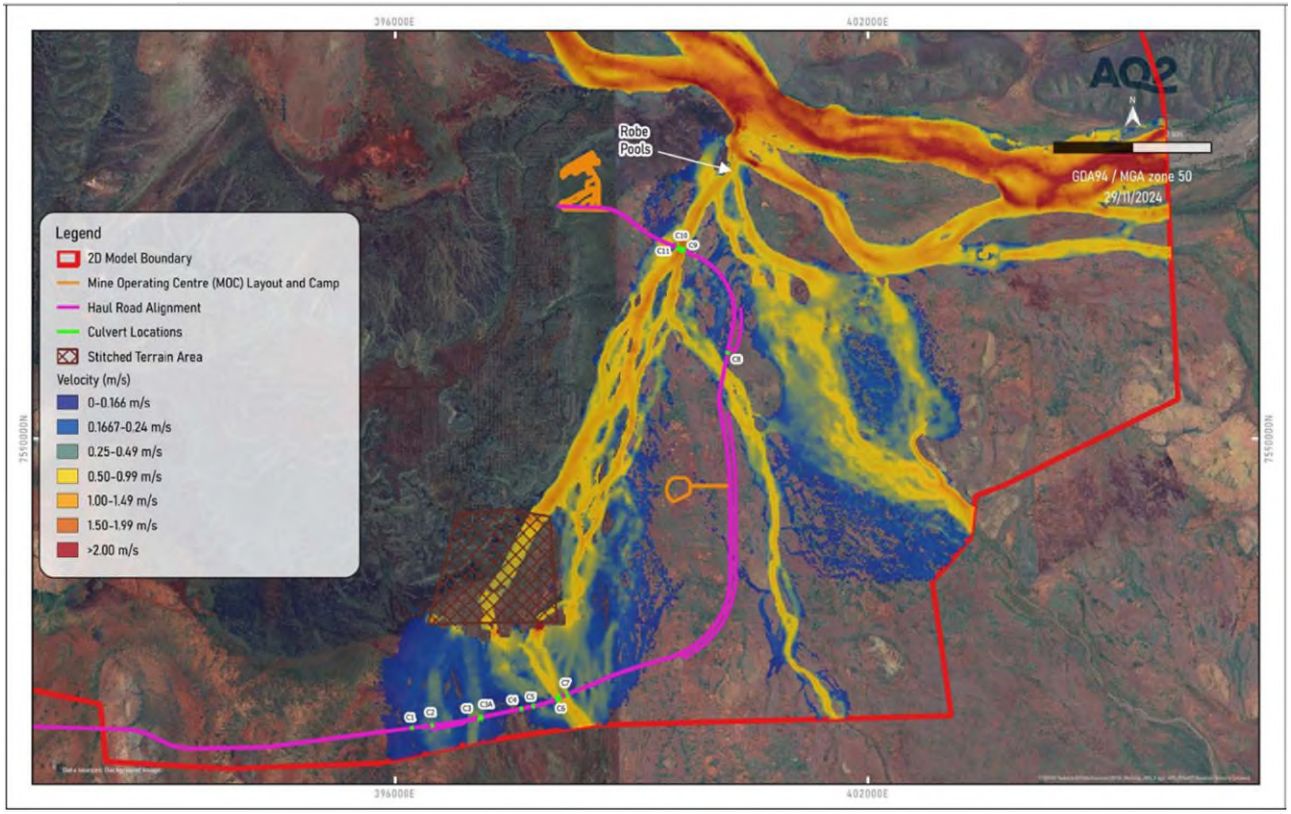


Figure 8.5.6 : Post-development Flood depth 10% AEP (AQ2 2024a)

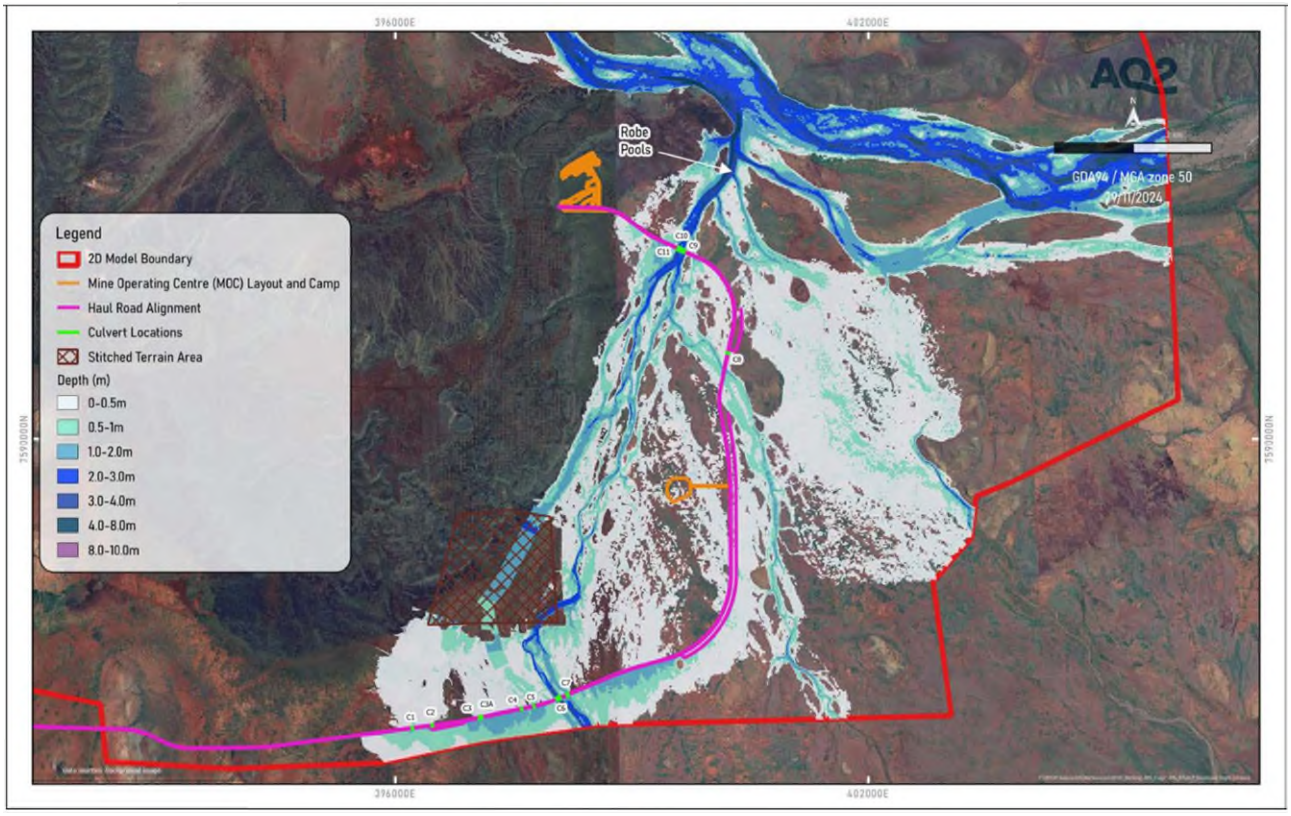


Figure 8.5.7 : Post-development Flood velocity 10% AEP (AQ2 2024a)

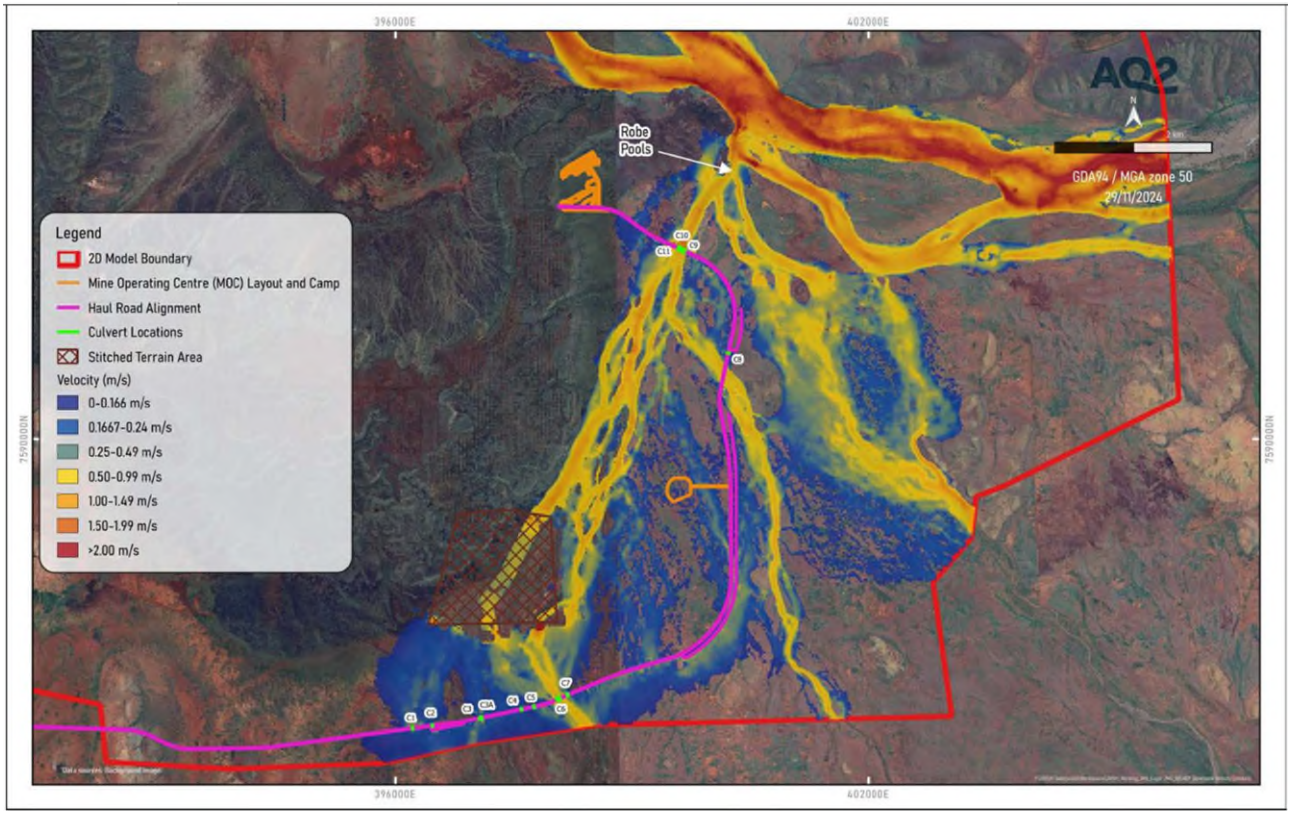
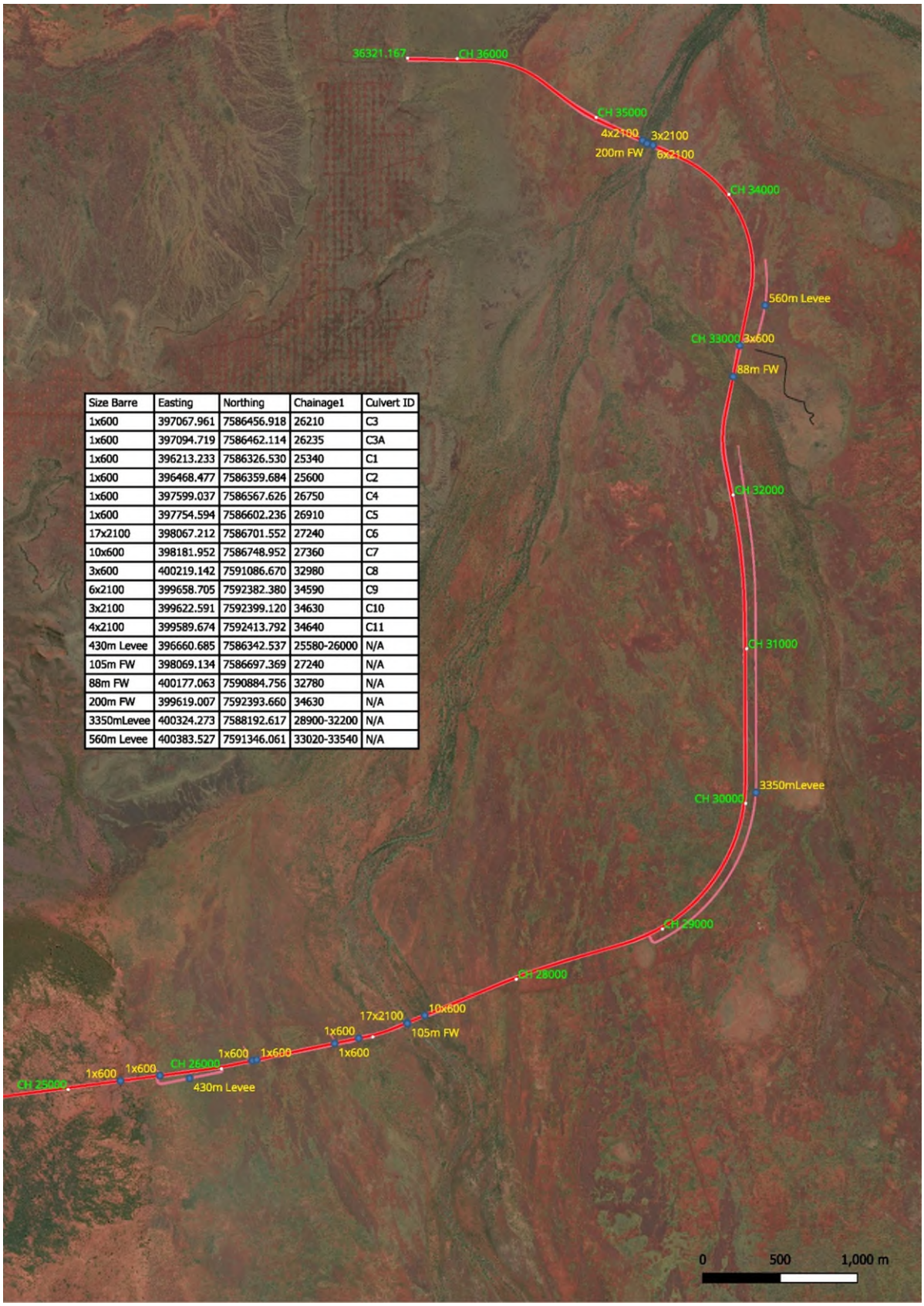


Figure 8.5.8 : Flood management infrastructure (Source: Shawmac)



Size Barre	Easting	Northing	Chainage1	Culvert ID
1x600	397067.961	7586456.918	26210	C3
1x600	397094.719	7586462.114	26235	C3A
1x600	396213.233	7586326.530	25340	C1
1x600	396468.477	7586359.684	25600	C2
1x600	397599.037	7586567.626	26750	C4
1x600	397754.594	7586602.236	26910	C5
17x2100	398067.212	7586701.552	27240	C6
10x600	398181.952	7586748.952	27360	C7
3x600	400219.142	7591086.670	32980	C8
6x2100	399658.705	7592382.380	34590	C9
3x2100	399622.591	7592399.120	34630	C10
4x2100	399589.674	7592413.792	34640	C11
430m Levee	396660.685	7586342.537	25580-26000	N/A
105m FW	398069.134	7586697.369	27240	N/A
88m FW	400177.063	7590884.756	32780	N/A
200m FW	399619.007	7592393.660	34630	N/A
3350mLevee	400324.273	7588192.617	28900-32200	N/A
560m Levee	400383.527	7591346.061	33020-33540	N/A

Figure 8.5.9 : Flood management infrastructure mine operations centre (Shawmac)

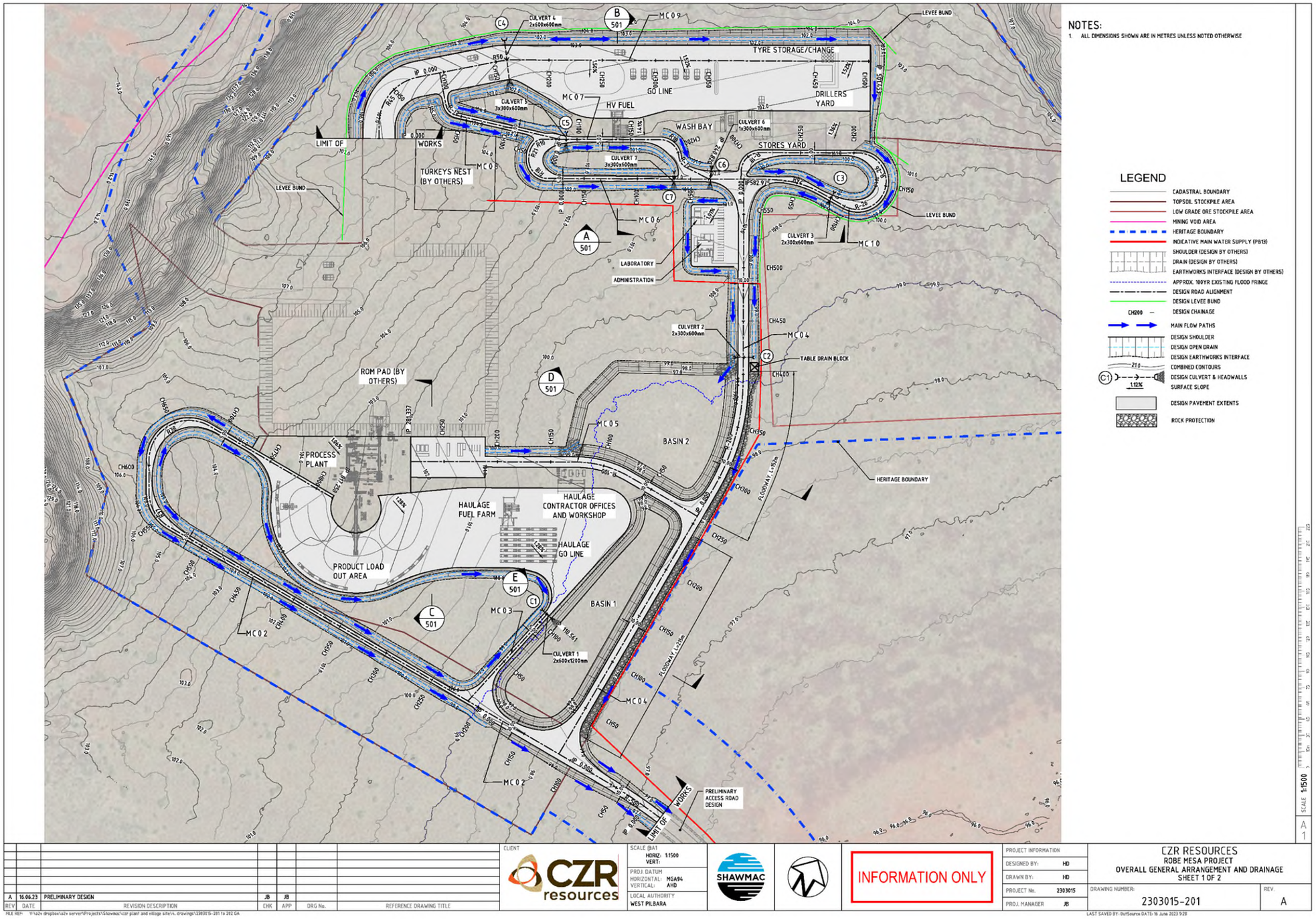


Figure 8.5.10 : 10% AEP Flood depth difference map (Source: AQ2 2024a)

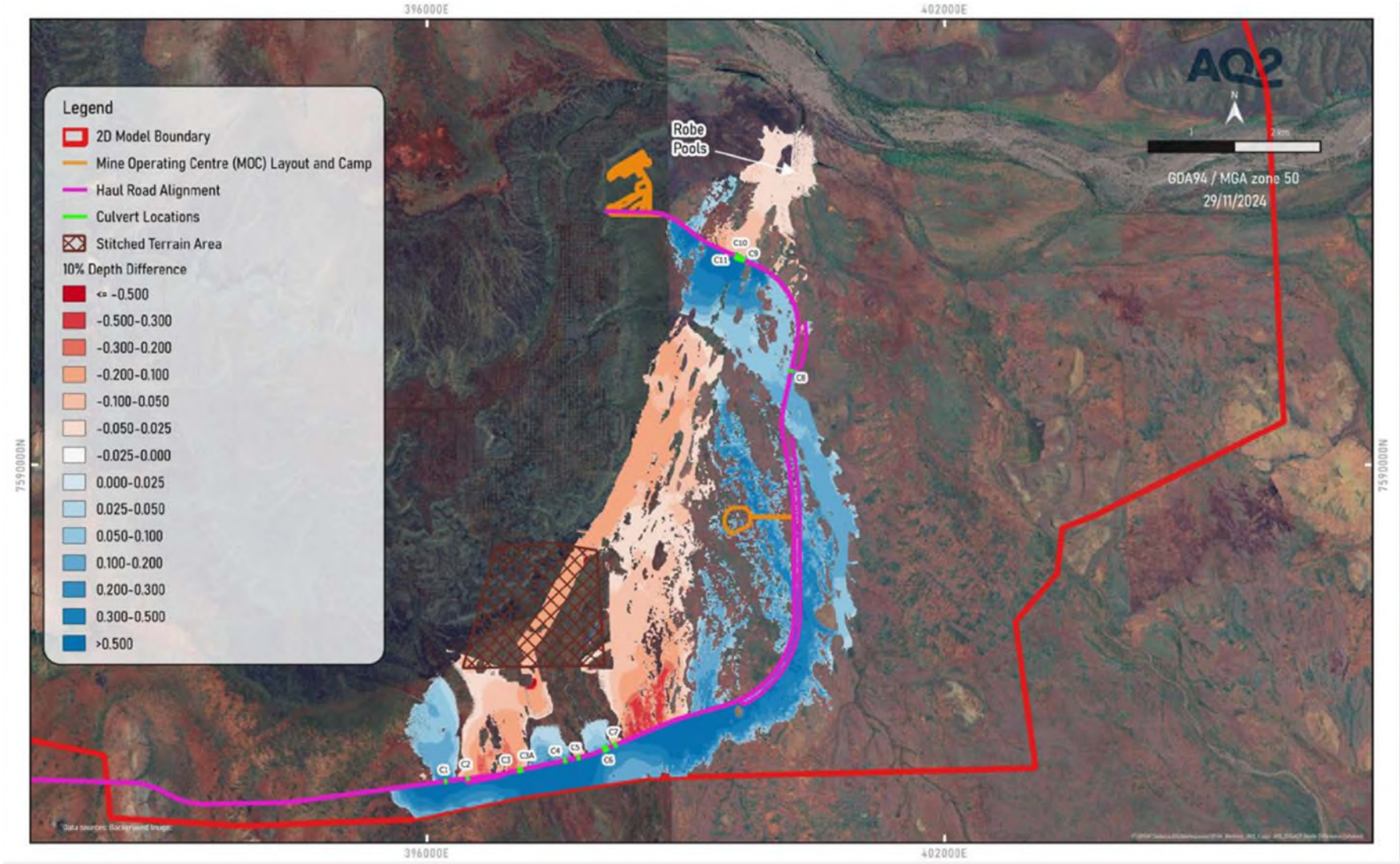


Figure 8.5.11 : 10% AEP Flood velocity difference map (Source: AQ2 2024a)

8.5.2 Groundwater

Information in this section is based on the following supporting studies:

- AQ2 (2023) Robe Mesa Project H2 Level of Assessment. Groundwater Abstraction from Bore PB13-3 for Mine Water Supply (Appendix 8-12, Rev 1 November 2023)
- AQ2 (2024b) Robe Mesa Project H2 Level of Assessment. Groundwater Abstraction from Bore PB13-3 for Mine Water Supply, Rev 2 November 2024)
- AQ2 (2024c) Robe Mesa Project, Groundwater Operating Strategy. Document prepared as part of 5C application, November 2024
- AQ2 (2024d) Robe Mesa Project, Groundwater Monitoring results memo
- AQ2 (2024e) Memo report responding to RFI. Groundwater Licence assessment of H2 report.

The major aquifer systems in the Robe Mesa Project area are encountered within the following main hydrostratigraphic units:

- Valley-fill deposits (alluvium, elluvium and coluvium materials).
- Palaeochannel Channel Iron Deposits (CID) (Robe Pisolite).
- Weathered bedrock that may have formed from the creek/river erosion.
- Faults/shear zones within the bedrock (fractured rock).

Production Bore PB13-3, is the preferred groundwater abstraction site for the Project, has been drilled into fault Breccia within the Duck Creek Dolomite.

8.5.2.1 Groundwater characteristics

Depths to groundwater range from 82 to 115 mAHD across the project area, which at the PB13-3 site is approximately 13 mbgl on the plains. Regionally, the groundwater flow direction is from the south southeast to the north northwest towards the Robe River and subsequently the coast.

The main aquifers are recharged by infiltration of rainfall and surface water flows. Recharge would be seasonal (wet season) with most recharge occurring through the valley-fill sediments (alluvium and colluvium) and into the CID during significant rainfall/runoff events and limited recharge into the faulted/fractured aquifer.

Groundwater discharge is likely to occur by evapotranspiration from the shallow aquifers (i.e., valley-fill) when groundwater levels are elevated after wet season and by throughflow to creeks/river (due to valley-fill aquifer being hydraulically connected to the surface water features).

Water quality from PB13-3 is fresh, with salinity of 540 mg/L total dissolved solids and is slightly alkaline (pH of 7.9). The water is of potable quality, with all parameters tested well below the Australian Drinking Water Guidelines (ASWG) (version 3.8, September 2022).

Only one water quality parameter exceeded the ADWG aesthetic maximum value. Hardness was recorded at 250 mg/L $CaCO_3$, compared to the guideline maximum value of 200 mg/L $CaCO_3$. This has no health implications but may cause some carbonate scaling in pipework. The water is bicarbonate dominant with sodium, calcium, and magnesium important, which is often indicative of waters that are associated with dolomites, in this case the Duck Creek Dolomite. Water within this sub field also indicates younger water with active recharge (AQ2 2023).

8.5.3 Water Use

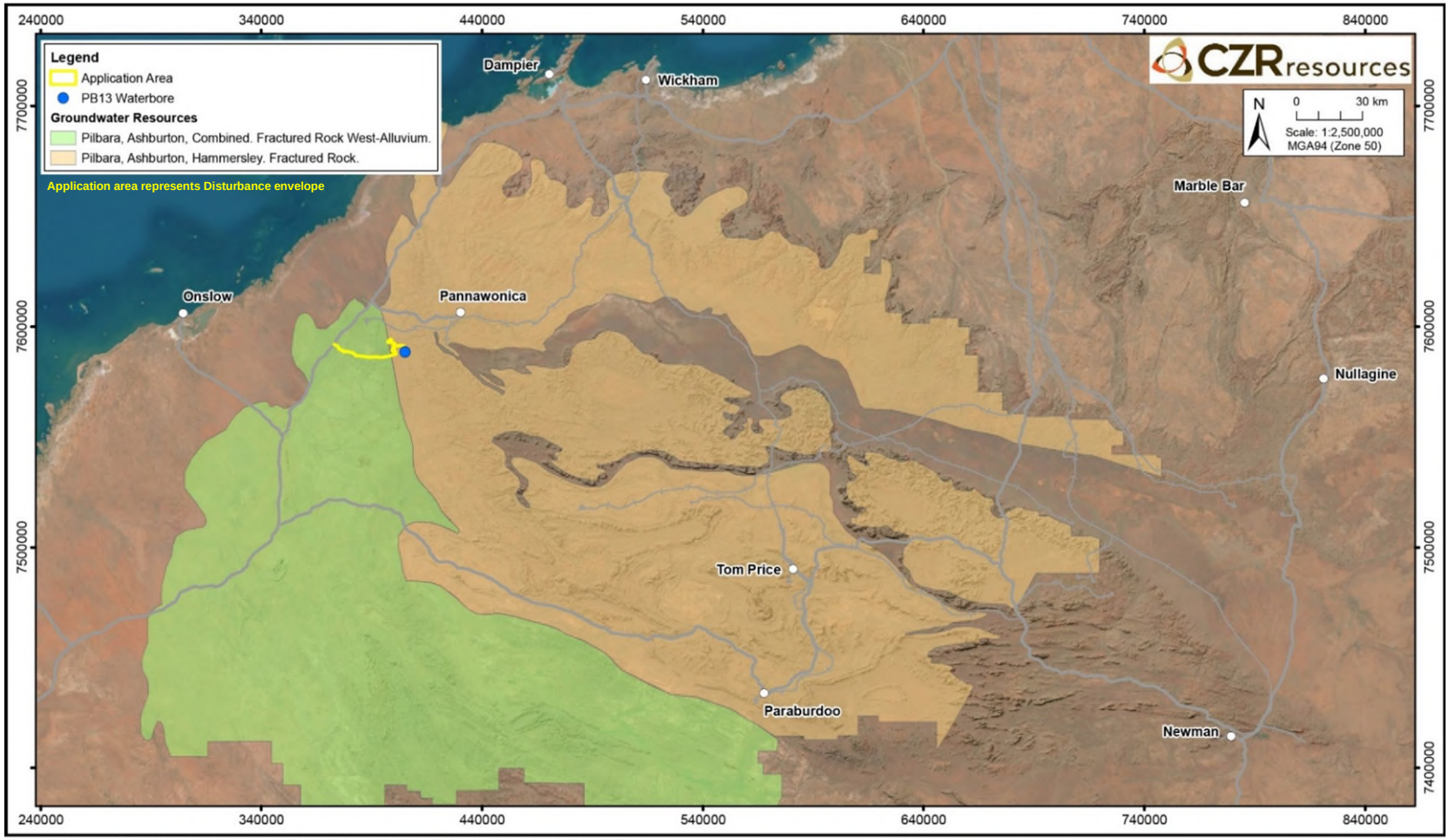
The anticipated long-term (~8 years) mine water demand for the Robe Mesa project is estimated at 17 L/s (i.e., 540,000 kL/year) for construction, dust suppression, processing, and camp requirements.

The deposit is above the water table and no mine pit dewatering is required.

The existing production bore PB13-3, drilled into the faulted/fractured Duck Creek Dolomite aquifer system, is located approximately 8 km southeast from the proposed Robe Mesa mine and can fully meet the Robe Mesa Projects water demand. Given the production bore is 8km from the Project area. It is also away from any potential GDVs associated with Mungarathoona Creek and Robe River (**Figure 8.4.11**).

APIM currently holds a RIWI Act 5C Groundwater licence (GWL180637/3) for an annual allowance of 95,000 kL from the Pilbara Hamersley fractured rock aquifer for geotechnical investigation, mineral exploration and bore construction purposes (**Figure 8.5.12**). CZR is currently in the process of transferring PB13-13 into a new groundwater license for the Robe Mesa Project.

Figure 8.5.12 : Location of PB13-3 and Groundwater Resources (DWER-084)



Drawn: CAD Resources (08 9246 3242), Date: Jun 2023, CAD Ref: a2967_F001_05, Rev: A ~ Groundwater Res: DWER-084

8.6 Heritage

8.6.1 Robe River Kuruma (RRK) People

CZR recognises the Robe River Kuruma (**RRK**) People as the traditional owners of the land that Robe Mesa is located on, and the importance to the RRK People of leaving country as close as possible to the way that it was found. Working collaboratively, CZR and RRK signed the Robe Mesa Native Title Agreement on 21 December 2022 which includes a 'live' Cultural Heritage Management Plan (**CHMP**) to ensure the parties continue to work together to develop appropriate protection and management measures for the places it contains. The CHMP:

- identifies Aboriginal Cultural Heritage (**ACH)** within CZR's Robe Mesa Project, sets out how further harm is to be avoided or to minimise the risk of further harm being caused to the ACH identified, and
- includes measures to manage ACH identified after commencement the CHMP.

Key provisions for minimising risk to ACH during the implementation of this ACHMP include:

- the obligations of both Parties in relation to the protection and management of ACH,
- how ongoing communications and consultations will occur,
- the involvement of RRK Cultural Consultants in the implementation of the Agreed Site Management Measures prior to, during and after the conduct of Robe Mesa Project Activities in the ACHMP Area,
- a New Finds procedure,
- provision for the investigation and management of ACH Incidents,
- procedures in the case of the suspected discovery of human remains or human skeletal remains, which may be Aboriginal Ancestral Remains, and
- suspension for cultural reasons.

Since 2014 CZR has undertaken numerous heritage surveys across the Yarraloola area and will continue to work collaboratively with RRK and undertake further heritage survey clearances as, and when, they need to occur.

8.6.2 Indigenous Cultural Heritage

The Proposal area is part of the overall cultural landscape of the Robe River Kuruma People and in this respect remains an important part of Robe River Kuruma culture and cultural record.

Robe River Kuruma Country is home to places of special significance to the Robe River Kuruma People, including ceremonial sites, song lines, the Robe River Jajiwurra, permanent pools and natural resources.

The Cultural Heritage Management Plan (**CHMP)** Disturbance envelope for the Robe Mesa Project does not include any part of a protected area.

For RRK People, this Country and this landscape is imbued with cultural heritage and values where their ancestors once lived, and where ancestral and spirit beings continue to live. There are tangible values that are associated with artefact scatters, caves, and scarred tress – those recorded during archaeological surveys. These places serve as a physical reminder of the cultural life of the RRK People's ancestors and the connection that exists now with present RRK generations.

The natural features of the Disturbance envelope are important to RRK People. The Robe River (Jajiwurra), the mesa edges, flora and fauna are all integral to the cultural landscape of the RRK People where they have hunted, gathered, lived, conducted ceremonies, shared stories and have been a part of this Country for thousands of years.

The tangible and spiritual world are inseparable for Robe River Kuruma people. Spirit beings made and continue to maintain the physical world, holding malevolent and benevolent relationships with Traditional Owners. Robe River Kuruma people carry a great honour and burden of responsibility to ensure that they and others care for country.

Major waterways (rivers and larger creeks), permanent and semi-permanent waterholes and springs are associated with the creation serpent. For Robe River Kuruma people, this serpent entity created and continues to inhabit, maintain, and sustain country. The serpent or snake is often referred to generically as warlu (snake). The presence of the warlu in water is essential for the health of country.

RRK have an intense interest in what CZR intend to do with the water in, around, and near their country. They want to know how it might be managed and what changes might result.

Best practice cultural heritage management, in terms of avoidance of harm to cultural heritage and where harm cannot be avoided proper management of the disturbance of these values, is integral to the management of these significant cultural places in the Robe Mesa Disturbance envelope. Figure 8.6.1 presents known heritage sites of the project area and CZR/RRK imposed No Go areas (red lines), which prohibit access to sites of cultural significance, particularly those associated with the Robe River.

It should be noted that mining operations will not intersect the water table and no mine pit dewatering is proposed for the Robe Mesa Project.

An Aboriginal Cultural Heritage Management Plan (CHMP) has been agreed between the Robe River Kuruma Aboriginal Corporation (**RRKAC**) on behalf of the Robe River Kuruma People, and CZR for the Robe Mesa Project. Cultural heritage impacts will be managed in accordance with the CHMP for the Robe Mesa Project.

8.6.3 Robe Mesa Heritage sites

Aboriginal cultural heritage information has been recorded over the area of the tenements for more than 30 years. CZR has reviewed over forty historic survey reports identifying the fifty (50) Aboriginal sites recorded on the Aboriginal Heritage Inquiry System (**AHIS**) (30 Registered sites and 20 Other Heritage Places) including water sources, burials, mythological, ceremonial sites, artefact scatters and camping sites (**Figure 8.6.1**). Sites of particular interest are listed in (**Table 8.6.1**).

The frequency of cultural heritage surveys and abundant cultural information on the public record means that there is a very low probability that unrecorded significant Aboriginal sites exist within the area of the tenements, meaning CZR has high confidence in its knowledge of the Aboriginal heritage site profile of the Project area.

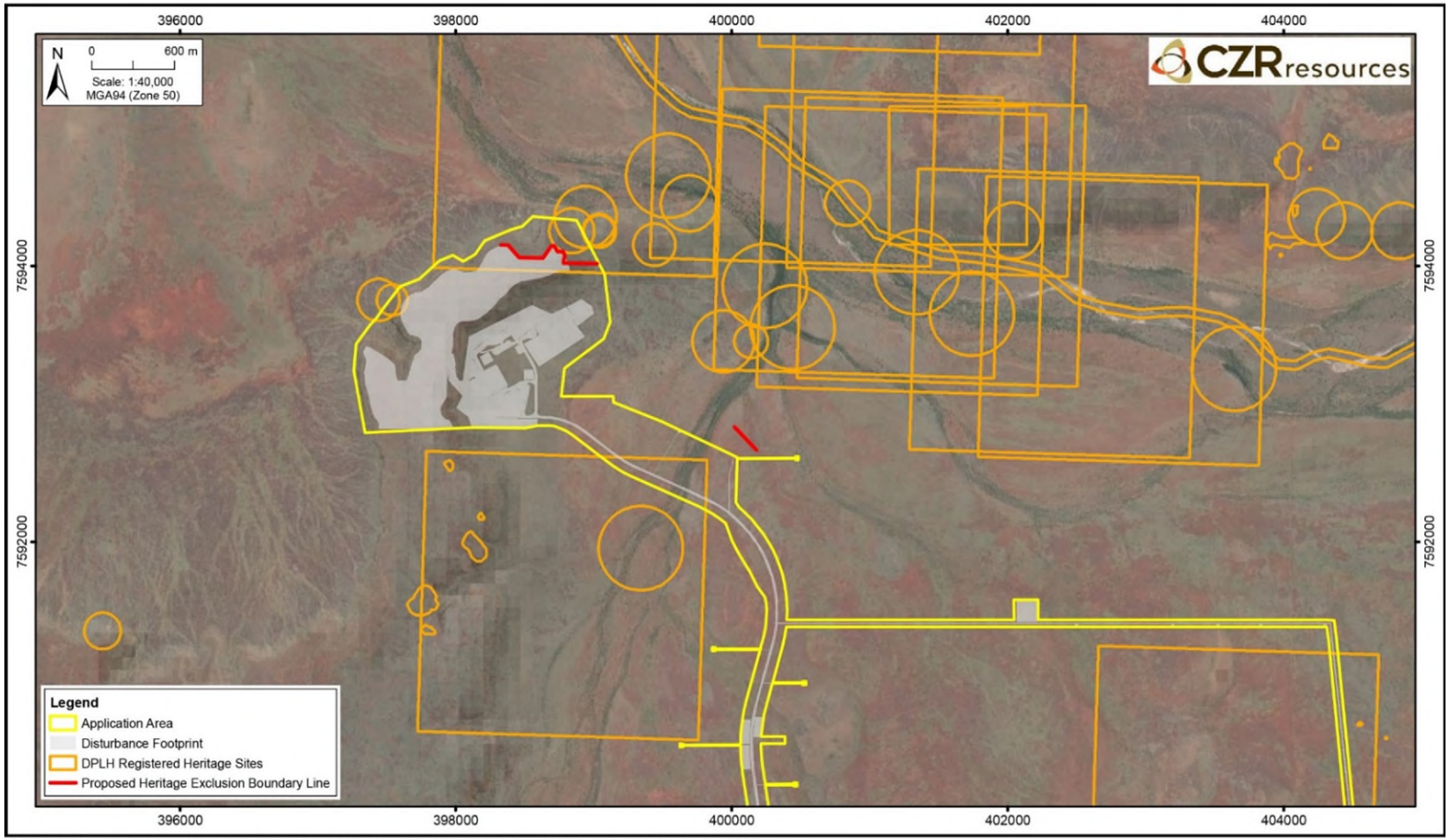
CZR's access agreements and ongoing cultural heritage engagement with RRK provide CZR with a high degree of confidence that ongoing access, exploration, and project development will continue to be achieved.

CZR's approach to the management of Aboriginal cultural heritage is based on the 'avoidance' principle and to promote preservation, wherein CZR will work with RRK to avoid impacting Aboriginal cultural heritage places wherever possible and will otherwise minimise and mitigate impacts on heritage values from adverse impacts of project activities.

Where CZR cannot avoid impacts to Aboriginal cultural heritage places, CZR will work with RRK to discuss and agree management and impact mitigation measures.

Table 8.6.1 : Registered sites and OHPs at the Robe Mesa Project	
DAA registered sites	**OHPs**
Robe Pool Burial 1 (ID 6467)	Robe Pool (ID 6409)
Robe Pool Burial 2 (ID 6468)	Pawatjami (ID 6410)
Robe Pool Burial 3 (ID 6469)	Tjalianu (ID 6412)
Chalyam Pool (ID 11411)	Tjililiyuni (ID 6421)
Jangunu Talu (ID 11413)	Observation Hill 1 (ID 6960)
Wuratalu (ID 6509)	Observation Hill 3 (ID 6962)
Robe River Quarry (ID 6556)	Observation Hill 4 (ID 6963)
Observation Hill 2 (ID 6961)	Observation Hill 5 (ID 6964)
Robe Pool 2 (ID 6917)	Observation Hill 6 (ID 6960)
Robe Pool 3 (ID 6918)	Robe Pool 1 (ID 6916)
Observation Hill 7 (ID 6913)	Ngariyiri (ID 6363)
	Observation Hill 8 (6914)

Figure 8.6.1 : Registered Heritage Sites and No Go areas of the Robe Mesa Project



Drawn: CAD Resources (08 9246 3242), Date: Jun 2023, CAD Ref: a2967_F001_24, Rev: A ~ Imagery: ESRI, Maxar (Oct 2021) ~ Heritage: DPLH

8.6.4 Robe Mesa History and engagement with Traditional Owners

CZR has worked closely with RRK with heritage surveys conducted to facilitate exploration activities on various tenements and progress project development. Surveys took place during:

1. 9 to 10 October 2014 an on-country work program clearance survey was undertaken by six KMAC Traditional Owners, one heritage consultants from Terra Rosa and two representatives of CZR.
2. 15 and 16 June 2015 an on-country work program clearance survey was undertaken by six KMAC Traditional Owners, two heritage consultants from Terra Rosa and two CZR representatives.
3. 1 to 4 August 2016 an on-country work program clearance survey was undertaken by six representatives of the Kuruma Marthudunera Traditional Owners, two heritage consultants from Terra Rosa, including one archaeologist and one anthropologist and two representatives from CZR.
4. 20 and 21 August 20-21, the third round of heritage surveys at Robe Mesa, P529 and Ashburton Magnetite Prospects conducted by Terra Rosa Consulting
5. 20 to 24 April 2022, an archaeological survey with the full involvement and assistance of the Robe River Kuruma People (RRK representatives), the Survey participants, nominated by the Robe River Kuruma Aboriginal Corporation (RRKAC) with authority to speak for country, was undertaken by Gavin Jackson Cultural Resource Management
6. 8 June 2022 The ethnographic work program clearance survey proposed for exploration works, including access tracks and water bore locations took place on the 8 June 2022 via helicopters which departed and returned from Karratha Airport. RRKAC engaged Stevens Heritage Services (SHS) to undertake the ethnographic survey on their behalf with six representatives of the Robe River Kuruma Traditional Owner group, which took place on the 8 June 2022. Stevens Heritage Services' consultant anthropologist Sarah Bell undertook the ethnographic heritage survey with Robe River Kuruma representatives.
7. 10-13 October 2022 Heritage survey anthropologist on site survey undertaken.
8. 29 November 2022 RRKAC engaged Stevens Heritage Services (SHS) to undertake the ethnographic survey on their behalf with five representatives of the Robe River Kuruma Traditional Owner group for the clearing of 2 borrow pit areas.
    - Consultant anthropologist Robin Stevens (Stevens Heritage Services) undertook the ethnographic heritage survey with RRK representatives. The ethnographic survey was conducted alongside the archaeological survey led by Ryan Hovingh (Snappy Gum Heritage Services).
    - On-country Cultural Mapping also occurred in Nov 2022 utilising Snappy Gum Services.
9. 12-23 April 2023 Archaeology survey with helicopter support for haul road and site infrastructure (roads, village, bore locations) was undertaken by Waru Consulting (Philip Haydock), six RRK representatives and one CZR employee.
10. 8-13 May 2023 Ethnographic survey of haul road and site infrastructure (roads, village, bore locations) was undertaken by was undertaken by Waru Consulting (Philip Haydock), six RRK representatives and one CZR employee.
11. 9-15 April 2024 Archaeology Heritage survey completed was undertaken by Echoes Cultural Heritage Management for exploration drill lines at Robe South Extension areas, a pathway extension to PB-13 borefield and proposed mining footprint on top of Robe Mesa.
12. 10-13 June 2024 Ethnographical heritage survey completed for areas from 9-15 April 2024 survey

CZR and RRK will continue to work collaboratively and undertake further heritage survey clearances as, and when, they need to occur. The heritage surveys continue to be used in the development of the CHMP to identify no go area and disturbance clearance. Specific results from these surveys are confidential.

8.7 Environmental threats

The environmental threats that could potentially harm environmental values beyond the planned ground disturbance associated with implementation of the project include dust emissions, spread of weeds, altered fire regimes, noise and vibration, light spill, and compromised surface water and groundwater quality.

8.7.1 Vehicle Strike and Entrapment

Fauna injuries and mortalities have the potential to occur during operations as a result of interactions with vehicles, infrastructure, machinery and the workforce. Machinery movement at night is minimised, when terrestrial fauna activities are highest.

The project has established ~55 km of roads, haulage, tracks, pipelines and maintenance corridors throughout the project area. The majority of road corridors are associated with Moderate value habitat types, including Plains and Flats and Low Woodland and Thickets. A very small area (0.5 ha) of high value mesa edge habitat (VSA2a) is proposed to be disturbed to establish a ramp to the mesa top. No other disturbance or interaction with this habitat type is proposed. Other high value habitat includes floodplains and drainage lines (VSA5), which will require approximately 1.5 ha of disturbance, all associated with drainage crossing points along road corridors.

To manage fauna impacts within the project area, CZR has developed an Environmental Management Plan, with a particular focus on managing impacts to conservation significant fauna.

8.7.2 Dust Emissions

Impacts to air quality with the potential to impact on native vegetation health are based on particulate emissions from operational areas or site roads.

Accumulation of dust particulates on leaf surfaces can affect the ability of plants to photosynthesise and transpire, causing a decline in plant health and potential mortality.

The Pilbara environment is naturally dusty, characterised by periodic ‘dust storms’ caused by large scale wind erosion of inland areas impacted by recent wildfires or following a prolonged dry period. Native vegetation is therefore expected to be reasonably tolerant to cycles of dust deposition imposed by existing climatic conditions.

Dust will be generated during the construction phase through land clearing, pre-stripping overburden and activities on exposed ground. During the operational phase, dust will be generated from light and heavy vehicle movements, blasting, ore excavation and haulage (open pit mining), ore crushing and screening and rehabilitation activities such as spreading overburden and topsoil. Wind action on cleared areas may also generate dust across all phases of the project.

Without mitigation, dust deposition could impact on the health and condition of native vegetation.

8.7.3 Spread of Weeds

Weeds may be introduced and spread around the project area through vehicle use and earthmoving activities. Ground disturbance and altered localised soil moisture/water regimes (such as could arise from wastewater

disposal and water/drainage) may also create a favourable environment for the establishment and proliferation of weeds.

Weed infestations can smother and out-compete native vegetation causing a decline in condition.

Weed hygiene and topsoil procedures will be developed and include clean down points prior to plant and vehicles entering site. The project will also maintain a weed monitoring and control program to eliminate any weed recruits from disturbed and rehabilitation sites.

8.7.4 Altered fire regime

Changes in fire regimes (i.e., increased frequency, intensity, extent) through uncontrolled or unintentional fires as a result of increased human activity in the area, has the potential to modify, degrade or remove fauna habitat or individuals.

Fire is a regular occurrence in the Pilbara, predominantly the result of planned controlled burning or lightning storms. A bushfire burnt part of the project area around the mine site at the end of 2022.

Changes in fire regimes can have a particularly significant effect on fauna species whose core habitat is associated with vegetation types that are more susceptible to fire (i.e., spinifex hummocks and grass tussocks). Species that prefer these vegetation types include the Western Pebble-mound Mouse.

Site personnel will be inducted in fire management procedures to prevent fires from starting within the project area and to control and contain unplanned and unintentional fires in and around the site to avoid fire spread.

Project specific impacts to fire regimes are not anticipated to adversely impact the environment given the low likelihood of occurrence (i.e., fire created by operational activities), open structure of the vegetation and widespread distribution of vegetation communities.

8.7.5 Noise and Vibration

Increased noise levels have the potential to alter behaviour responses in fauna. For example, audible cues for breeding activity may be disrupted or foraging time may be reduced. Noise and vibration from mining, processing or vehicle movements also has the potential to impact sensitive premises.

Noise and vibration assessments at the site have determined noise impacts comply with relevant criteria and studies (LGA 2023; Bullen and Creese 2014). Sites both at the mesa edge (setback 50 m from operations) and at a known Ghost bat maternity roost (off tenement, > 2 km south of the Project) predicted noise emissions in the range of 45-55bB and 18-22 dB respectively, and well below the criteria level of 70dB (LGA 2023).

8.7.6 Light spill

Artificial light spill has the potential to attract some species to an area and influence the behaviour of local fauna populations. Behavioural changes may include factors such as migration, breeding, or foraging.

Northern Quolls are known to occur around mine sites and human dwellings, and shelter amongst mine infrastructure such as vehicles, machinery, and laydown areas where there are enhanced levels of light. There may be a higher concentrations of prey items e.g., insects around lights (Oakwood 2008). It is unlikely that there will be a significant impact on quoll populations as a result of changes to the nocturnal light environment.

The Western Pebble-mound Mouse is also quite adaptable and may acclimatise to certain disturbances such as light as evident from active mounds been observed adjacent to exploration camps. No significant impact is expected for the Western Pebble-mound mouse as a result of changes to light.

Ghost Bats are known to be susceptible to light spill, with strong light sources potentially causing confusion or temporary blindness during foraging (Martin 2012). The Pilbara Leaf-nosed Bat also displays a curiosity for light sources (Threatened Species Scientific Committee 2016b), and foraging Pilbara Leaf-nosed Bats have been recorded as attracted to artificial lights (car headlights, head torches and mine site lights) (Cramer et al. 2016b), which may make it more susceptible to vehicle strike or predation.

While localised increases to the light environment may induce some behavioural changes in predatorial species impacts to population abundance are not expected to be significant in large part because these species have not been recorded in high numbers in the project area.

8.7.7 Spills and leaks

Spills, material containment or equipment malfunction may result in discharge to the local environment. Substances posing a risk of environmental harm if discharged include hydrocarbons, reagents and other chemicals used in mining and ore processing. Diesel will be used as fuel for the mining fleet.

Refuelling will occur within a purpose-built facility with bunding and drainage to capture contaminated runoff then directed to a treatment unit.

Treated effluent from the WWTPs will be irrigated to a spray field to infiltrate or evaporate. This effluent will be treated to comply with the 'Extra Low' risk category under Guidelines for the Non-Potable Uses of Recycled Water in Western Australia (Department of Health 2011). The treated effluent irrigation area has been selected in accordance with the Water Quality Protection Note (WQPN 22) Irrigation with Nutrient Rich Wastewater (DoW 2008). The proposed site is not subject to waterlogging, needs no artificial drainage or require natural watercourses to be diverted. There is no Sensitive Water Resource within 500 m of the WWTP facility or associated sprayfield. The location of the facility is not within a Public Drinking Water Source Area, a wetland with defined conservation value, Environmental Protection Policy Lakes, Waterways Management Areas, or other wetland.

8.7.8 Modified groundwater regime

There is no mine dewatering associated with the Robe Mesa Project. Groundwater supply for the project will be sourced from an existing (licenced) bore site approximately 8 km south east of the mine area, away from any drainage systems and potential groundwater dependent ecosystems.

8.7.9 Modified surface water flows

Small, localised catchment changes to surface water flows are likely to result from construction and operation of mining infrastructure.

Most of the project is located within the surface water management area for the Robe River and its tributaries, with a portion of the proposed Access Road located within the Onslow Coastal Plain, a predominantly flat area with little or no defined drainage channels. The proposed disturbance is likely to affect 0.03% of the Robe River Catchment and 0.02% of the Coastal Plain Catchment.

Run-off from active mining areas, including the mine pit and any temporary stockpiles, will be managed by bunding and diversion drains to avoid sediment transport from areas of ground disturbance.

Culverts and other appropriate drainage treatments will be incorporated into the final design of the haul road to ensure no change to natural hydrology downstream.

8.7.10 Sediment discharge

Erosion from poorly designed or constructed landforms can result in localised transfer of sediment downstream from disturbed areas. These sediments could be transported along creek lines during peak flows and settle in existing pools of the Robe River as flows subside.

Landforms will be designed, constructed, and rehabilitated to create a safe, stable, non-polluting landform and toe bunds/sumps constructed at the base of landforms to limit material transport offsite as rehabilitation surface stabilise.

9. Environmental Risk Assessment

9.1 Risk Assessment Approach

A project environmental risk assessment was conducted in accordance with DEMIRS Mining Proposal guidelines (DMIRS 2020). **Table 9.1.1** defines the DEMIRS environmental factors considered by CZR and the relevant risk pathways that may affect those factors. **Table 9.1.2** to **Table 9.1.3** were used to assist with defining the risks as presented in the matrix on **Table 9.1.4**. **Table 9.1.5** provided the risk assessment details for each potential impact.

Table 9.1.1 : Environmental Objectives

Environmental Factor	DEMIRS Objective
Biodiversity	To maintain representation, diversity, viability, and ecological function at the species, population, and community level.
Water Resources	To maintain the hydrological regimes and quality of groundwater and surface water so that existing and potential uses, including ecosystem maintenance, are protected.
Land and Soils	To maintain the quality of land and soils so that environmental values are protected
Rehabilitation and Mine Closure	Mines are closed in a manner to make them (physically) safe to humans and animals, (geo-technically) stable, (geo-chemically) non-polluting/non-contaminating, and capable of sustaining an agreed post-mining land use, and without unacceptable liability to the state.

*Although the Social Surrounds factor is for the EPA, it has also been considered for some impacts

Table 9.1.2 : Consequence Guidance					
Factor	**Insignificant**	**Minor**	**Moderate**	**Major**	**Severe**
Biodiversity	Alteration or disturbance to an isolated area with no effect on habitat or ecosystem Loss of an individual plant / animal of conservation significance	Alteration or disturbance to <10% of a habitat or ecosystem resulting in a recoverable impact within 2 year Loss of multiple plants / animals of conservation significance	Alteration or disturbance to 10-40% of a habitat or ecosystem resulting in a recoverable impact within 2-5 years Loss of <50% known local population of plant / animal of conservation significance	Alteration or disturbance to 40-70% of a habitat or ecosystem resulting in a recoverable impact within 5-15 years Loss of >50% known local population of plant / animal species with possible loss of entire local population	Alteration or disturbance to >70% of a habitat or ecosystem resulting in a recoverable impact >15 years Local loss of conservation significant or listed species. Extinction of a species
Water Resources	Negligible change to hydrological processes, water availability or water quality.	Short-term modification of hydrological processes, water availability and quality within project tenure, but no change in beneficial use.	Medium-term modification of hydrological processes, water availability and water quality within project tenure, but no change in beneficial use. Short-term modification of hydrological processes, water availability and water quality outside project tenure, but no change in beneficial use.	Long-term modification of hydrological processes, water availability and water quality within project tenure, but no change in beneficial use Medium-term modification of hydrological processes, water availability and water quality outside project tenure, with change in beneficial use	Long-term or permanent modification of hydrological processes, water availability or water quality outside project tenure, with impacts to a water-dependent environmental value and/or change in beneficial use
Land and Soils	Clean-up by site personnel, rectified immediately. Confined to immediate area around source	Clean-up by site personnel, remediation within 1 year. Confined to operational area	Clean-up by site personnel, remediation within 1-3 years Minor impact outside Disturbance Envelope or minor impact to soil stockpiles	Clean-up requiring external specialist, remediation within 3-10 years Impact has migrated outside the Disturbance Envelope or contamination of soil stockpiles	Clean-up requiring external specialist Remediation >10 years, or permanent residual impact Impact outside the tenement boundary.

Table 9.1.2 : Consequence Guidance					
Factor	**Insignificant**	**Minor**	**Moderate**	**Major**	**Severe**
Rehabilitation and Mine Closure	Site is safe, stable a non-polluting Post mining land use is not adversely affected	Site is safe, all major landforms are stable, and any stability or pollution issues are contained and require no residual management Post mining land use is not adversely affected	Site is safe, and any stability or pollution issues require minor, ongoing maintenance by end land-user Post mining land use cannot proceed without some management.	Site cannot be considered safe, stable, or non-polluting without long-term management or intervention Post mining land use cannot proceed without ongoing management	Site is unsafe, unstable and/or causing pollution or contamination that will cause an ongoing residual affect Post mining land use cannot be achieved

Table 9.1.3 : Likelihood Guidance		
Likelihood	**Frequency**	**Definition**
Almost Certain	Twice or more per year	Event will occur during the Project / period under review High number of known incidents
Likely	Once per year	Event likely to occur during the Project / period under review Regular incidents known
Possible	Once in 2-5 years	Event may occur in some instances during the Project / period under review Occasional incidents known
Unlikely	Once in 5-10 years	Event is not likely to occur during the Project / period under review Some occurrences known
Rare	Less than once every 10 years	Event will occur in exceptional circumstances during the Project / period under review Very few or no occurrences

Table 9.1.4: Risk Matrix							
			Consequence				
			Insignificant	**Minor**	**Moderate**	**Major**	**Severe**
			6	**7**	**8**	**9**	**10**
Likelihood	**Almost Certain**	**5**	Medium (M11)	High (H16)	High (H20)	Extreme (E23)	Extreme (E25)
	Likely	**4**	Medium (M7)	Medium (M12)	High (H17)	High (H21)	Extreme (E24)
	Possible	**3**	Low (L4)	Medium (M8)	Medium (M13)	High (H18)	High (H22)
	Unlikely	**2**	Very Low (L2)	Low (L5)	Medium (M9)	Medium (M14)	High (H19)
	Rare	**1**	Very Low (L1)	Very Low (L3)	Low (L6)	Medium(M10)	Medium (M15)

Table 9.1.5 : Environmental Risk Assessment

Ref No.	Phase	Risk Pathway	Description of Impact	Inherent Risk			Treatment	Residual Risk		
				Consequence	Likelihood	Rank		Consequence	Likelihood	Rank
Factor: Biodiversity										
E1-001	• Pre-construction • Pre-construction • Construction • Construction • Post-operations	Unauthorised land clearing resulting in loss of environmental and heritage values	Loss of fauna habitat, vegetation, or sites of cultural significance beyond approved ground disturbance limits	Major	Possible	High (18)	• Final mine pit design to be spatially limited to observe the mesa edge buffer and No-Go Areas. • Final design of project footprint to reduce extent of habitat cleared, including utilising existing tracks and co-locating infrastructure, where feasible. • Develop and implement ground disturbance approval procedures,. • Approved clearing limits to be delineated on ground and spatially managed via GPS technology. • Implement rehabilitation procedures for decommissioned areas of the project footprint, in accordance with the project's Mine Closure Plan (CZR Resources 2023b).	Major	Unlikely	Medium (14)
E1-002	• Construction • Operations • Care & Maintenance • Closure	Weed introduction and spread	Introduction and/or spread of weed species degrading fauna habitat and vegetation	Moderate	Unlikely	Medium (9)	• Weed management and monitoring to be conducted • Compliance with Weed Hygiene and Control Procedure. • Vehicles and equipment cleaned and inspected prior to entry to site or moving between areas on site. • Regular inspections of work fronts and operational areas, with weed and seed inspections. • Vehicles and equipment restricted to designated roads and tracks. • Herbicide spraying or physical removal undertaken where deemed necessary. • Weed awareness covered in site inductions. • Weed hygiene training undertaken by employees involved in vehicle and equipment transfers. • Demarcation of known weed locations.	Moderate	Rare	Low (6)
E1-003	• Construction • Operations • Care & Maintenance • Closure	Fauna interaction with site traffic and construction machinery	Fauna mortality or injury from vehicle strike and/or entrapment	Minor	Likely	Medium (12)	• Restrict vehicles speeds on site. • Vehicles and mining equipment confined to designated roads and tracks. • Establish fauna culverts within high value habitat areas to allow fauna movement under road crossings. • Fauna management covered in site inductions. • Reporting and communication of native fauna sightings	Minor	Unlikely	Low (5)
E1-004	• Construction • Operations • Care & Maintenance • Closure	Fauna interactions with project developed water bodies	Entrapment in water bodies resulting in fauna mortality or injury	Minor	Possible	Medium (8)	• All sumps, sediment ponds and turkeys nest dams designed to incorporate egress ramps at intervals less than 50m. • Diversion drains installed to prevent ponding. • Regular inspections completed in accordance with site inspection schedule. • Fauna will be removed by personnel experienced with fauna rescue • Details of recovered fauna shall be recorded as incidents. • Workforce inductions to identify likely significant fauna.	Minor	Unlikely	Low (5)
E1-005	• Construction • Operations • Care & Maintenance • Closure	Increased feral animals from increased access to water and food resources	Increased competition for food and habitat resulting in suppression of native fauna	Minor	Possible	Medium (8)	• Avoid first - Domestic waste facilities are contained, inspected and waste is regularly removed from the Proposal or disposed to onsite landfill. • Regular waste management audits completed. • Incidental feral/ fauna sightings will be recorded and assessed on an annual basis and information provided in Annual Environmental Report (AER). • Staff will be trained on identification of feral fauna • Feral animal control program in conjunction with adjacent landowners and DBCA guidance • Potential sources of pooled water to be monitored (inc. spraying of treated effluent over a large area to prevent ponding, air conditioner units).	Minor	Unlikely	Low (5)

E1-006	• Construction • Operations • Care & Maintenance • Closure	Land clearing and infrastructure establishment	Habitat fragmentation, restricting animal movements and separating flora or fauna populations	Moderate	Possible	Medium (13)	• Clearing works to be conducted in accordance site clearing permit • Environmental Management Plan to maximise the ongoing protection and long-term conservation of fauna species within the vicinity of disturbance areas	Moderate	Unlikely	Medium (9)
Factor: Water Resources										
E1-007	• Construction • Operations	Change in water demand requirements	Increasing production rates and local groundwater resources	Moderate	Possible	Medium (13)	• Reduction education, consumption monitoring and continuous improvement targets	Moderate	Unlikely	Medium (9)
E1-008	• Pre-construction • Operations	Altered surface hydrology from infrastructure establishment	Localised change to surface water flows impacting downstream sensitive receptors (Robe Pools) through erosion and/or sedimentation.	Moderate	Possible	Medium (13)	• Where possible Infrastructure has been placed outside of 1 in 100-year flood zone (refer 8.5). • Clearing, movement and disturbance around creek lines and pooled water will be restricted. • Construction of surface drains to control and manage surface runoff, separation of clean water runoff (undisturbed catchments) from dirty (sediment laden) and contaminated runoff from disturbed catchments • Installation of surface water management infrastructure (culverts, sediment basins, drainage channels, levees) to mitigate flow • Flood risk and surface water containment and diversion strategy for events greater than 1 in 20 year - 72 hours rainfall event	Moderate	Unlikely	Medium (9)
E1-009	• Construction • Operations	Altered groundwater regimes from excessive groundwater abstraction	Impacts to groundwater resources and GDEs Groundwater levels do not recover as expected	Minor	Possible	Medium (8)	• Compliance with license/RIWI • Short term abstraction • No GDEs located in proximity to bore fields - groundwater abstraction areas • Nominate future additional bore draw points to manage localised aquifer depression	Minor	Unlikely	Low (5)
Factor: Land and Soils										
E1-010	• Construction • Operations • Closure	Poor storage and handling of hazardous materials (including hydrocarbons)	Contamination of land, soil resources, groundwater, or surface water as a result of leaks and spills	Moderate	Possible	Medium (13)	• Implement appropriate storage and handling procedures for hazardous materials • Removal of all hazardous materials prior to closure. • The general provisions of the EP Act and Environmental Protection (Unauthorised Discharges) Regulations 2004 apply • Chemicals, hydrocarbons, and other environmentally hazardous materials will be stored and handled in accordance with the Dangerous Goods Safety Act 2004 and associated regulations. • Hydrocarbon storage will be self-bunded. • Bunding, containment and handling will be managed in accordance with the Australian Standard 1940-2004, Storage and Handling of Flammable and Combustible Liquids. • Facilities containing hydrocarbons and/or chemicals have been designed within bunds to contain 110% of the contents of the material stored. • Spill control measures in strategic positions with appropriate equipment available to contain and collect/recover hydrocarbon spills. • Personnel trained in use of spill kits. • Spills will be cleaned up and contaminated soils will either be remediated or removed from site by a licenced third party. • Equipment pre-start checks to be undertaken.	Moderate	Unlikely	Medium (9)

E1-011	• Construction • Operations	Greenhouse gas emissions generated from light/heavy vehicles, generators, and the power station	Contribute to climate change and deterioration of air quality. Reputational damage	Moderate	Almost Certain	High (20)	• GHG accounting for the Robe Mesa Project has been undertaken to better understand potential impact. Annual emission estimate for the Robe Mesa Project is ~51,000 tCO2e (Greenbase 2023). • Gas emissions reported to the National Pollutant Inventory (NPI) and National Greenhouse and Energy Reporting Scheme (NGERS) • Energy efficiency and greenhouse gas emissions will be considered with equipment selection and purchase (including increased use of renewable energy sources). • Regular maintenance of diesel combustion equipment. • Education of the workforce on energy efficiency and monitoring consumption • Project represents a small footprint relative to other mining groups in the region	Moderate	Likely	High (17)
E1-012	• Operations	Artificial light spill	Altered behaviour (i.e., foraging) of conservation significant fauna (Ghost Bat and Pilbara Leaf-nosed Bat)	Minor	Possible	Medium (8)	• Lighting to be directed to required areas only and incorporate shielding to reduce unneeded light spill. • Impacts to population abundance is not expected to be significant as these species have not been recorded in high numbers in the project area.	Minor	Unlikely	Low (5)
E1-013	• Construction • Operations • Care & Maintenance • Closure	Runoff from cleared ground or landforms resulting in erosion and sedimentation	Sediment runoff into downstream surface water systems	Moderate	Unlikely	Medium (9)	• Where possible Infrastructure set above appropriate flood levels (refer Section 8.5). • Roads designed and constructed to suitable standard to minimise runoff. • V drains, bunds and sumps installed to control and divert surface water flows from disturbed areas. • Bunds, sumps, and drains repaired and maintained as required. • Installation of surface water management infrastructure (culverts, drainage channels, levees) to mitigate flow immediately following land clearing	Moderate	Rare	Low (6)
E1-014	• Construction • Operations • Care & Maintenance • Closure • Post Closure	Potential Acid Forming (**PAF**) materials in waste	Impacts to receiving environments from contaminated run-off and seepage. Poor revegetation success. Requirement for ongoing remedial works.	Moderate	Unlikely	Medium (9)	• Baseline sampling indicates waste rock at the Robe Mesa Deposit is non-acid forming and the risk of acid-metalliferous drainage is low (Graeme Campbell Associates 2022), but continued testing will occur throughout operations for ore and waste characterisation programs.	Moderate	Rare	Low (6)
E1-015	• Construction • Operations • Care & Maintenance • Closure	Generation of particulate emissions (dust) from mine and transport (haulage) activities	Dust accumulation on vegetation resulting in a decline in plant health	Minor	Possible	Medium (8)	• Dust suppression activities are conducted where dust emissions are likely to be deposited on significant vegetation so as to not damage native vegetation. • Water trucks used to control dust emissions on cleared areas and material movement operations. • Progressive clearing and rehabilitation will be undertaken to reduce the extent of open areas and dust generation • Dust emissions are visually monitored during ground clearing operations (including topsoil stripping) and activities are modified or stopped if unacceptable dust emissions are generated. • Controlled screening activities from Plant operations • Disturbance activities to be undertaken in accordance with internal clearing permitting process and site clearing procedures	Minor	Unlikely	Low (5)
E1-016	• Construction • Operations • Care & Maintenance • Closure	Geotechnical instability	Erosion of pit walls. Increased sediment load to surface water. Unsafe conditions.	Minor	Unlikely	Low (5)	• Pit depth has maximum depth of 60 m • Audit pit against design specifications • Construct abandonment bunds outside zone of instability • Pit will be partially backfilled with waste.	Minor	Rare	Very Low (3)
E1-017	• Construction • Operations • Care & Maintenance • Closure	Unplanned fire resulting from project activities	Fauna and livestock fatality or injury. Loss of biodiversity and native vegetation	Minor	Unlikely	Low (5)	• Vehicles and equipment restricted to designated roads and tracks. • Vehicles and equipment fitted with fire control equipment. • Implementation of Hot Works Permit system. • Installation of firebreaks at selected locations in consultation with DFES. • Water carts in operation on site and fire-fighting trailer on site • Emergency Response Team will receive firefighting training	Minor	Rare	Very Low (3)

E1-018	• Construction • Operations • Care & Maintenance • Closure	Waste Water Treatment Plant spill or leakage	Contamination of land, soil resources, groundwater, or surface water.	Minor	Unlikely	Low (5)	• Spill competency training undertaken by relevant employees. • V drains, bunds and sumps installed to control and divert surface water flows. • WWTP to be regularly inspected. • Effluent discharge to be monitored	Minor	Rare	Very Low (3)
E1-019	• Construction • Operations • Care & Maintenance • Closure	Excess noise from construction and operation activities (blasting and excavation)	Disturbance or disruption to sensitive receptors, including local fauna	Minor	Possible	Medium (8)	• Regular servicing/maintenance of equipment. • Noise Modelling shows no impact on sensitive noise receptors (bat habitat)	Minor	Unlikely	Low (5)
Factor: Land and Soils (Social Surrounds)										
E1-020	• Construction • Operations • Care & Maintenance • Closure	Disturbance to Aboriginal and other heritage sites.	Damage to heritage sites and places. Reputation damage	Severe	Unlikely	High (19)	• ACHMP in place, and regularly updated • Induction for site staff. • Internal clearance permits in place to ensure all clearing works are compliant with regulatory requirements. • Mark cultural heritage sites appropriately signage. • Maintain buffers during closure works. • Employ technological solutions (geo-referencing tools). • Maintain the ongoing consultation with RRK as part of ongoing operations • Stop work procedure implemented if unexpected sites are located during operations or closure earthworks.	Severe	Rare	Medium (15)
E1-021	• Construction • Operations • Care & Maintenance • Closure	Mine establishment (and presence) on country	Disruption to traditional use of the land. Loss of access to sites of cultural significance.	Severe	Unlikely	High (19)	• ACHMP in place, and regularly updated • Consultation with RRK to identify cultural values throughout operational phases. • Safe access requirements are factored into closure designs. • Induction for site staff. • Internal disturbance clearance permit in place to ensure all clearing works are compliant with regulatory requirements. • Mark cultural heritage sites appropriately -signage. • Maintain buffers during closure works. • Employ technological solutions (geo-referencing tools). • Compliance with rehabilitation and landform design. • Ongoing engagement with RRK	Severe	Rare	Medium (15)
E1-022	• Construction • Operations • Care & Maintenance • Closure	Generation of particulate emissions (dust) from mine activities	Particulate and concentrate emissions impacting human health.	Moderate	Possible	Medium (13)	• Dust control measures in design • Water cart operational, • Restrict vehicles on site and only driving on roads, reduced vehicle speeds • Water sprays on conveyors and stockpiles • Regular dosing of stockpiles by sprinkler • PPE, area inductions • Material characterisation studies found no hazardous materials (Si, asbestos etc.)	Moderate	Unlikely	Medium (9)
E1-023	• Construction • Operations • Care & Maintenance • Closure	Stakeholder expectations are not met.	Company reputation adversely affected. Missed opportunities to improve closure outcomes. Increased closure implementation and post-closure management costs. Extended timeframe to relinquishment of mining tenure.	Moderate	Possible	Medium (13)	• Build a strong relationship with and effectively engage relevant stakeholders in the closure planning process. • Continue to validate impact predictions. • Work with Traditional Owners early and ongoing • Cultural heritage management plan implemented • Access agreements in place that outline interactions with Pastoralists, Mining companies and other stakeholders	Moderate	Unlikely	Medium (9)
Factor: Rehabilitation and Closure										

E1-024	• Closure • Post Closure	Unauthorised access to mine voids and landforms from abandonment bund failure or poor placement	Human injury or fatality.	Major	Possible	High (18)	• Abandonment bunds to be designed to consider access and drainage risks. • Rehabilitate access roads where they are no longer required. • Abandonment bunds in place of pit. • Regular inspection of abandonment bunds • Pit will be partially backfilled with waste • Signage erected around landform warning of hazard • Stakeholder communication and education. • Management of visitor access (consultation with regulators and stakeholders).	Major	Unlikely	Medium (14)
E1-025	• Operation • Care & Maintenance • Closure	Unexpected or Temporary closure	Unable to achieve closure designs. Unable to relinquish tenements. Reputational damage	Moderate	Possible	Medium (13)	• Continue to undertake progressive closure planning • Continue to regularly update the closure cost estimate and make accounting provision for closure costs. • Continue to engage regulators to develop a plan to relinquish mining tenure in a coordinated manner and to establish a plan for the long-term management of residual liabilities. • Short mine life • Small mining footprint	Moderate	Unlikely	Medium (9)
E1-026	• Construction • Operations • Care & Maintenance • Closure • Post Closure	Inadequate volume, handling and/or storage of topsoil	Reduction of seed viability. Unable to meet post closure land use.	Moderate	Possible	Medium (13)	• Closure criteria developed and approved under Robe Mesa Project Mine Closure Plan • Available topsoil stripped from all clearing areas and stockpiled for use during rehabilitation. • Topsoil and subsoil stripping based on soils characterization assessment • Material movement and storage incorporated in mine planning. • Respreading of stockpiled topsoil and vegetation over rehabilitation areas. • Pre-stripping of topsoil not to be undertaken in wet conditions. • Topsoil stripping depth based on soils characterization assessment. Topsoil stockpiled to a height of no more than 2 m. • Topsoil stockpiles located away from drainage channels and trafficable areas and appropriately signed and recorded for future reference. • The water source for dust suppression on rehabilitation/topsoil materials is relatively fresh, not saline.	Moderate	Unlikely	Medium (9)
E1-027	• Operations • Post operations	Poor revegetation outcomes.	Requirement for ongoing remedial works. Weeds become dominant. Excessive erosion of rehabilitated surfaces. Limited fauna recolonisation. Rehabilitated areas do not achieve a self-sustaining native vegetation outcome. Inability to meet closure criteria.	Minor	Likely	Medium (13)	• Implement an appropriate rehabilitation plan (surface treatments, seed selection, collection, storage, and management). • Ongoing weed management. • Undertake post closure monitoring and maintenance as required. • Undertake progressive rehabilitation and trials when areas are available to be rehabilitated. • Use high quality seed. • Ongoing engagement with stations • Small revegetation area	Minor	Unlikely	Low (5)
E1-028	• Closure • Rehabilitation • Post Closure	Failure to achieve completion criteria and/or fulfil closure obligations due to: • Nature, including practicality, of completion criteria • Incomplete awareness of obligations; or • Insufficient funds.	Prolonged monitoring and post-closure phase. Delayed tenement relinquishment Compliance risk.	Moderate	Possible	Med. (M13)	• Implement and maintain the Robe Mesa Project Mine Closure Plan consistent with DMIRS (2020) guidance and conduct regular reviews • Rehabilitation to be undertaken progressively, where practicable • Studies, science applied to ensure completion criteria are realistic/achievable • Maintain obligations register • Annual review of closure obligations and cost, and adequate provisioning in line with financial provisions in a manner consistent with Australian Accounting Standards Board (AASB) Standard 137 Provisions, Contingent Liabilities and Contingent Assets	Moderate	Unlikely	Med. (9)

10. Environmental outcomes, performance criteria and monitoring

10.1 Identification of Risks

Guidelines for Mining Proposals in Western Australia recommend that outcomes should be developed for risk events with an inherent risk rating of medium or above (DEMIRS 2020). DEMIRS (2020) guidance indicates that medium risks may only require an outcome if the residual risk is still medium when treatment is applied. Additionally, environmental outcomes that are regulated by another agency or legislation also do not need to be considered, unless the proponent considers the environmental outcome requires further clarity.

A summary of the Project risk assessment which require environmental outcomes is provided in **Table 10.1.1**.

Table 10.1.1 : Summary of risk assessment and required environmental outcomes

Ref No.	Risk Pathway	Inherent Risk Rating	Residual Risk Rating	DEMIRS Mining Proposal Outcomes required or regulated by other agencies
E1-001	Unauthorised land clearing resulting in loss of environmental and heritage values	High (18)	Med. (14)	No. Directly regulated by DWER (EP Act). No outcome required.
E1-002	Weed introduction and spread	Med. (9)	Low (5)	Yes
E1-003	Fauna interaction with site traffic and construction machinery	Med. (12)	Low (5)	Yes
E1-004	Fauna interactions with project developed water bodies	Med. (8)	Low (5)	No. Not considered significant enough to warrant targeted monitoring and reporting of any exceedance to DEMIRS. Project water bodies (i.e. turkeys nest) represent a small proportion of the project footprint.
E1-005	Increased feral animals from increased access to water and food resources	Med. (8)	Low (5)	No. Not considered significant enough to warrant targeted monitoring and reporting of any exceedance to DEMIRS.
E1-006	Land clearing and infrastructure establishment	Med. (13)	Med. (9)	No. Directly regulated by DWER (EP Act). No outcome required.
E1-007	Change in water demand requirements	Med. (13)	Med. (9)	No. Directly regulated by DWER (RIWI Act). No outcome required.
E1-008	Altered surface hydrology from infrastructure establishment	Med. (13)	Med. (9)	Yes
E1-009	Altered groundwater regimes from excessive groundwater abstraction	Med. (8)	Low (5)	No. Directly regulated by DWER (RIWI Act). No outcome required. Not considered significant enough to warrant targeted monitoring and reporting of any exceedance to DEMIRS.
E1-010	Poor storage and handling of hazardous materials (including hydrocarbons)	Med. (13)	Med. (8)	Yes.

E1-011	Greenhouse gas emissions generated from light/heavy vehicles, generators, and the power station	High (20)	High (17)	No. Gas emissions will be reported to the National Pollutant Inventory (NPI) and National Greenhouse and Energy Reporting Scheme (NGERS) and regulated by DWER via Environmental Protection Regulations
E1-012	Artificial light spill	Med. (8)	Low (5)	No. Not considered significant enough to warrant targeted monitoring and reporting of any exceedance to DEMIRS. Light spill management and monitoring is addressed in EMP.
E1-013	Runoff from cleared ground and landforms resulting in erosion and sedimentation	Med. (9)	Low (5)	Yes. Refer to Item E1-008 in this table
E1-014	PAF materials in waste	Med. (9)	Low (5)	No. Not considered significant enough to warrant targeted monitoring and reporting of any exceedance to DEMIRS.
E1-015	Generation of particulate emissions (dust) from mine and haulage activities – vegetation/habitat condition	Med. (8)	Low (5)	No
E1-016	Geotechnical instability	Low (5)	Very Low (3)	No. Not considered significant enough to warrant targeted monitoring and reporting of any exceedance to DEMIRS.
E1-017	Unplanned fire resulting from project activities	Low (5)	Very Low (3)	No. Hot works and fire training are managed in accordance with the site's internal operating procedures and Safety/Emergency Management System (SMS). Potential hazard facilities (i.e., magazine) are managed under DG regulations and relevant Australian Standards.
E1-018	Waste Water Treatment Plant spill or leakage	Low (5)	Very Low (3)	No. WWTP constructed and operated in accordance with WA Department of Health and site's Part V Licence administered by DWER and site's internal EMS. Directly regulated by another agency/legislation – no outcome required.
E1-019	Excess noise and vibration from construction and operation activities (blasting and excavation)	Med. (8)	Low (5)	No. Not considered significant enough to warrant targeted monitoring and reporting of any exceedance to DEMIRS. Management of noise and vibration on fauna is addressed in EMP.

E1-020	Disturbance to Aboriginal and other heritage sites.	High (19)	Med. (15)	No. Aboriginal heritage sites are managed in accordance with the *Aboriginal Cultural Heritage Act 2*021 (WA) and the site's internal EMS. Directly regulated by another agency/legislation – no outcome required.
E1-021	Mine establishment (and presence) on country	High (19)	Med. (15)	No. Aboriginal heritage sites are managed in accordance with the *Aboriginal Cultural Heritage Act 2*021 (WA) and the site's internal EMS. Directly regulated by another agency/legislation – no outcome required.
E1-022	Generation of particulate emissions (dust) from mine activities – human health	Med. (13)	Med. (9)	No. Dust generation is managed in accordance with the site's internal EMS and Safety/Emergency Management System (SMS). Not considered significant enough to warrant targeted monitoring and reporting of any exceedance to DEMIRS.
E1-023	Stakeholder expectations are not met.	Med. (13)	Med. (9)	No. Not considered significant enough to warrant targeted monitoring and reporting of any exceedance to DEMIRS.
E1-024	Unauthorised access to mine voids and landforms from abandonment bund failure or poor placement	High (18)	Med. (14)	No. This risk is addressed in the Project's MCP.
E1-025	Unexpected or Temporary closure	Med. (13)	Med. (9)	No. This risk is addressed in the Project's MCP.
E1-026	Inadequate volume, handling and/or storage of topsoil	Med. (13)	Med. (9)	No. This risk is addressed in the Project's MCP.
E1-027	Poor revegetation outcomes.	Med. (13)	Low (5)	No. This risk is addressed in the Project's MCP.

10.2 Monitoring

Performance criteria have been developed to be as realistic, measurable, and uncomplicated as possible. Monitoring programs are in place for most aspects, although may change over time as opportunities for improvement are recognised or technology changes. **Table 10.4.1** provides details of the environmental outcomes that will be monitored and reported directly to the DEMIRS.

Additional monitoring requirements may result from assessment of the Works Approval and Native Vegetation Clearing Permit applications.

CZR seek to avoid, prevent, mitigate, and remediate any environmental impacts from operational activities. Baseline environmental studies since 2020 have contributed significantly to the scientific understanding of environmental significance of Robe Mesa and allowed CZR to design the project in a way that identifies, prevents, and minimises adverse environmental impacts.

The investigations have relied on the technical skills and experience specialised consultants and covered a range of environmental factors and aspects relevant to the project, including terrestrial and subterranean fauna;

flora and vegetation; noise; vibration/blasting; geotechnical / geochemical analysis of soils and waste; hydrogeology and hydrology; and ethnographic and archaeological investigations.

The results of these investigations, consultations and risk assessments have all been considered in developing the project and minimising native vegetation disturbance footprint to 270 hectares for the mine access road, infrastructure, and mine location. CZR is of the view that the Robe Mesa Project can be implemented without material risk the environmental values of the area.

CZR will implement monitoring to measure the effectiveness of the management actions in achieving the project's HSECS outcomes and to identify when additional mitigation or contingency responses may be needed.

10.3 Reporting

Reporting against the performance criteria provided in **Table 10.4.1** will be by way of the Annual Environmental Report (AER), submitted online via the DEMIRS Environmental Assessment and Regulatory System (EARS). Any breaches of the performance criteria may require DEMIRS to be notified within 24 hours of identification of the breach.

Factors regulated by DWER are reported in the AER for the Works Approval / Operating License, with a similar requirement to report breaches within 24 hours of identification of an incident.

The Environmental Reporting and Record Keeping Procedure will provide details of what requires reporting and when.

10.4 Environmental outcomes, performance criteria and monitoring

Table 10.4.1 : Environmental outcomes, performance criteria and monitoring

Risk Reference (Table 9.1.5)	Environmental Factor and Objective	Risk Pathways	Environmental Outcome	Performance Criteria	Monitoring
E1-002	*Biodiversity:* *To maintain representation, diversity, viability, and ecological function at the species, population, and community level.*	Clearing activities resulting in the spread of introduced weeds into the surrounding environment.	No introduction of new weed species or weed populations	Zero introductions of WONS or Declared Weed species Weed populations to either remain stable or decrease during the Project, based on baseline data	Periodic visual inspections of areas with potential for weeds to occur. Record on Project inspection sheets. Results of rehabilitation monitoring and topsoil stockpile monitoring (as per MCP monitoring requirements).
E1-003		Fauna interaction with site traffic and construction machinery	Reduce the risk of vehicle strike and entrapment	Speed limits are clearly signposted at key locations (e.g. creek crossings and mesa edge) on the road network. Speed restrictions of 60 km/ hr are implemented within key habitat locations (e.g. creek crossings and mesa edge) on the road network. Limit light vehicle movements at night-time while still meeting operational needs. Conduct training and awareness sessions, particularly during periods of seasonal fauna activity	Inspections of conservation significant fauna habitat prior to clearing. Log and report fauna encounters and vehicle strikes. Daily inspections of features likely to trap fauna (i.e., open trenches). Monthly review of environmental incident register. Any injuries or deaths to local fauna species of conservation significance are reported to DBCA. A summary of inspections, encounters, incidents, and translocation outcomes will be provided to DEMIRS in the AER. Training Register

Table 10.4.1 : Environmental outcomes, performance criteria and monitoring					
Risk Reference (Table 9.1.5)	**Environmental Factor and Objective**	**Risk Pathways**	**Environmental Outcome**	**Performance Criteria**	**Monitoring**
E1-008	Water Resources: *To maintain the hydrological regimes and quality of groundwater and surface water so that existing and potential uses, including ecosystem maintenance, are protected.*	Altered surface hydrology from infrastructure establishment	Water quality and quantity downstream of the mine disturbance boundary is maintained within the range of variance of pre-mining background levels.	Surface water control structures are constructed and operating in accordance with engineered designs and surface water models, considering rare to extreme rainfall events.	Audit of constructed surface water control structures associated against engineered designs and surface water models, particularly in relation to rare and extreme rainfall events Daily inspections (and maintenance as required) of the water storage facilities and surface water management structures. Inspections are to be undertaken by personnel with experience and training in site inspections and should include examination of bunding, sediment basins, liner (if any), flow pathways and downstream impacts. Monthly water level readings and quarterly water quality sampling from water storage ponds. Analysis will include pH, EC, TDS, acidity, alkalinity, and soluble SO4, and Cl, Ca, Mg, Na, K, Ag Al, As, Ba, Be, B, Cd, Co, Cr, Cu, Fe, Hg, Mo, Mn, Ni, Pb, Sb, Se, and Zn. Water level reading and sampling is to be undertaken by an environmental specialist with experience or training in water sampling and preparing samples for laboratory analysis. Maintain project water balance, including capacity and volume status of each water storage facility. A summary of inspections, audits, water monitoring results (quality and levels) and

Table 10.4.1 : Environmental outcomes, performance criteria and monitoring					
Risk Reference (Table 9.1.5)	**Environmental Factor and Objective**	**Risk Pathways**	**Environmental Outcome**	**Performance Criteria**	**Monitoring**
					project water balance updates will be provided to DEMIRS in the AER. Detailed monitoring data, chain of custody documents and laboratory analysis available on request.
E1-010	Land and Soils: *To maintain the quality of land and soils so that environmental values are protected.*	Poor storage and handling of hazardous materials (including hydrocarbons)	No impact to surrounding soils or landscape from hydrocarbon and fluid contamination.	All hydrocarbon and chemical spills controlled/contained/cleaned up within 24 hrs	Prestart assessments on large machinery and vehicles to check for leaks. Incident report sheet to be filled out if leak is present and greater than 20 litres.
E1-028	Rehabilitation and Closure: *Mines are closed in a manner to make them (physically) safe to humans and animals, (geo-technically) stable, (geo-chemically) non-polluting/non-contaminating, and capable of sustaining an agreed post-mining land use, and without unacceptable liability to the state.*	Failure to meet completion criteria	Safe, stable, and non-polluting mine footprint that has achieved completion criteria and is consistent with the post mining land use Achievement of sustainable vegetation/habitats compatible with surrounding undisturbed areas, wherever practicable Fulfilment of legal obligations Interests and knowledge of stakeholders considered. Closed areas are safe (no compromise in the health and safety of mine workers and the public).	Completion criteria defined in approved Mine Closure Plan (MCP) have been met.	Monitoring of progress in MCP completion criteria parameters Audit of attainment of MCP completion criteria.

Table 10.4.1 : Environmental outcomes, performance criteria and monitoring					
Risk Reference (Table 9.1.5)	**Environmental Factor and Objective**	**Risk Pathways**	**Environmental Outcome**	**Performance Criteria**	**Monitoring**
			Minimisation of the spread and prevalence of weeds and feral animals. Protection of traditional heritage and cultural values.		
	See Mine Closure Plan for Rehabilitation and Closure criteria and monitoring				

11. Environmental Management System

11.1 Environmental Record

CZR is committed to the protection of the environment. The business objective is to plan and implement the Robe Mesa Project in a way that minimise the impact on the environment. To meet environmental objectives, CZR are committed to the following actions and practices:

- Maintaining an environmental management standard.
- All staff and contractors will be made aware of the environmental policy and procedures with an appropriate level of training provided
- Act within the business towards reducing greenhouse gas emissions and environmental impact wherever possible
- Reduce and where possible, prevent pollution
- Facilitate recycling of materials and resources wherever possible
- Pursue a progressive rehabilitation program by returning disturbed areas where possible to pre-existing conditions
- Working to identify, assess and control environmental risks
- Encourage open dialogue with employees, regulators and the public on environmental issues and be responsive to their concerns
- Monitoring and review for continual improvement of the Company's environmental performance

Specific environmental initiatives include:

- An Environmental Management Plan

CZR's HSECS management system utilises the web-based PeopleTray program to capture HSECS documentation, activities, plans, performance monitoring and KPIs.

An Environmental Management Plan (EMP) has been developed, which documents environmental outcomes and the management actions to be implemented to achieve these outcomes during the construction and operation of the project. Ground Water Operating Strategy (GWOS) and the Water Management Plan outline how water will be managed, monitored and reported while also listing potentially adverse impacts on operations on the local and regional water resources. The Cultural Heritage Management Plan has been collaboratively developed between CZR and RRK to ensure cultural education, awareness and preservation is maintained. The project closure and rehabilitation elements are captured in the Mine Closure Plan, while stakeholder engagement and sustainability efforts are recognised as critical to maintaining social licence to operate.

11.2 Documentation

Table 11.2.1 : Environmental Management Documentation	
Document number	**Document Title**
Policy	Health, Safety, Environmental, Community and Sustainability Policy
Management Plans	Environmental Management Plan
	Groundwater Management Plan and Operating Strategy
Procedures	Waste Management Procedure
	Dust Management Procedure
	Spill Response Procedure
	Site Disturbance Procedure
	Hydrocarbon Storage and Handling Procedure
	Environmental Reporting and Record Keeping Procedure
Forms	Site Disturbance Permit Form
Registers	Environmental Monitoring Register
	Environmental Incident and Corrective Action Register
	Environmental Obligations Register
	Site Disturbance Register

11.3 Training

An environmental induction will be developed for the operation and is provided to all staff and contract personnel. The induction will detail CZR's environmental obligations and management strategies, including the procedures applicable to environmental management.

The training program will be developed based on site-specific requirements as the project progresses. Spill response training will be undertaken periodically to inform site personnel of how to use the spill kits provided on site.

A training register will be maintained to record training, qualifications, and competencies of personnel with records maintained in the PeopleTray system.

11.4 Incidents

An incident and corrective actions register will be maintained via the PeopleTray HSECS system. The register records environmental incidents and corrective actions applied. The effectiveness of corrective actions will be reviewed periodically and amended if required.

11.5 Review and improvement

An annual review of the project's environmental performance will be undertaken alongside preparation of the annual environmental reports for DEMIRS and DWER. The intent of the review is to identify opportunities for improvement in environmental management, and to determine and implement appropriate measures to address identified issues.

The system will be able to capture key performance metrics targets and auditing schedule.

12. Mine Closure Plan

The Mine Closure Plan is provided in Supplement B of this Mining Proposal.

13. Expansions and/or alterations to an approved mining proposal

This proposal is the first submission of a Mining Proposal for the Robe Mesa project and as such there is currently no approved mining proposal requiring expansions and or alterations.

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15. Appendices (at the time of assessment)

Table 15.1.1 : Appendix Document Summary		
Appendix No.	**Reference**	**Report Title**
Appendix 8-1	Graeme Campbell and Associates (GCA 2022)	Robe Mesa Project: Mine-Waste & LG-Ore Characterisation Investigation – Implications for Mining-Stream Management.
Appendix 8-2	RPS (2021)	Detailed Flora and Vegetation Assessment. Robe Mesa and Robe East extension deposits
Appendix 8-3	Biota (2023a)	Robe Mesa Project Detailed Flora and Vegetation Survey
Appendix 8-4	Biota (2023b)	Robe Mesa Project: Haul Road Realignment and Associated Vegetation Extrapolation and Consolidation
Appendix 8-5	Bamford Consulting Ecologists (2023)	CZR Resources Ltd. Robe Mesa Iron Ore Project Fauna Assessment
Appendix 8-6	Lloyd George Acoustics (2023)	Environmental Noise Assessment - Robe Mesa Project
Appendix 8-7	Biota Environmental Sciences (Biota) (2023c)	Robe Mesa Troglofauna Baseline Assessment Report
Appendix 8-8	CZR (2023)	Review of Troglofauna Habitat at Robe Mesa
Appendix 8-9	Biota (2022)	Robe Mesa Project Short-range Endemic Invertebrate Fauna Survey
Appendix 8-10	AQ2 (2021)	CZR Robe Mesa – Preliminary Surface Water Modelling
Appendix 8-11	AQ2 (2022)	Robe Mesa Study – Haul Road Surface Water Assessment
Appendix 8-12	AQ2 (2023)	Robe Mesa Project H2 Level of Assessment. Groundwater Abstraction from Bore PB13-3 for Mine Water Supply. Rev 1, Nov 2023

Appendix 8-1: Mine-Waste and Low-Grade Ore Characterisation (GCA 2022)

Appendix 8-2: Detailed Flora and Vegetation Assessment (RPS 2021)

Appendix 8-3: Detailed Flora and Vegetation Survey (Biota 2023a)

Appendix 8-4: Road Realignment and Vegetation Consolidation (Biota 2023b)

Appendix 8-5: Fauna Assessment (BCE 2024a)

Appendix 8-6: Environmental Noise Assessment (LGA 2023)

Appendix 8-7: Troglofauna Assessment Report (Biota 2023c)

Appendix 8-8: Review of Troglofauna Habitat (CZR 2023)

Appendix 8-9: Short-range Endemic Invertebrate Survey (Biota 2022)

Appendix 8-10: Surface Water Modelling (AQ2 2021)

Appendix 8-11: Road Surface Water Assessment (AQ2 2022)

Appendix 8-12: H2 Assessment Report. Bore PB13-3 (AQ2 2023) (Rev 1 Nov 2023)

16. Supplements

Supplement A - Authorisation from the Tenement Holders

Figure 16.1.1: Tenement Authorisation Letter

CZR Resources Ltd
ABN: 91 112 866 869
Suite 9, Level 3, 47 Havelock St
West Perth, Western Australia 6005
PO Box 16
West Perth WA 6872
Phone: +61 8 9468 2050
Website: www.czrresources.com

Zanf Pty Ltd
ACN 154 589 152
8 Kings Park Road,
West Perth WA 6005

22 August 2023

Department of Mines, Industry Regulation and Safety
Minerals House – 100 Plain Street
East Perth WA 6004

To Whom It May Concern,

Robe Mesa Iron Ore Project – Mining Proposal and Mine Closure Plan

We refer to the Mining Proposal (MP) and Mine Closure Plan (MCP) for the development of the Robe Mesa Iron Ore project involving above the water table mining on Robe Mesa and Processing facility for up to 5 Mtpa.

The Mining Proposal and Mine Closure Plan for Robe Mesa are made on behalf of Zanthus Resources Pty Ltd, (which is a wholly owned subsidiary of CZR Resources Ltd) and forms part of the Yarraloola Iron Ore Project, which is a joint venture between Zanthus Resources Ltd for CZR (85%) and ZanF Pty Ltd (15%).

- Zanthus Resources Pty Ltd, ACN 077 454 963, ABN 23 077 454 963 (85/100)
- ZanF Pty Ltd ACN 154 589 152 (15/100)

The proposed activities will be undertaken on the below tenements. We hereby confirm that Zanthus Resources Pty Ltd is authorised to access the Tenure for the purposes of works described in the Mining Proposal and Mine Closure Plan which includes attending to all matters necessary for its approval.

This hereby provides tenement holder authorisation. Please don't not hesitate to contact Stefan Murphy if you have any queries.

Tenement ID, Description and Ownership

ID	Area (ha)	Description	Ownership ZANTHUS	Ownership ZANF	Granted	Expiry
M08/533	581.2	Robe Mesa Mine	85%	15%	4/01/2023	3/01/2044
L08/295	606.2	Southern Haul Road	100%		2/06/2023	1/06/2044
L08/297	621.9	Infrastructure corridor	85%	15%	2/06/2023	1/06/2044
L08/303	827.8	Borefield	85%	15%	2/06/2023	1/06/2044
L08/319	12.4	Southern Haul Road	100%		*Pending	
L08/320	33.1	Southern Haul Road	100%		19/07/2023	18/07/2044
L08/321	84.2	Southern Haul Road	100%		8/08/2023	7/08/2044
L08/322	158.0	Southern Haul Road	100%		*Pending	
L08/323	28.3	Village	85%	15%	*Pending	
L08/326	22.1	Haul Road creek crossing	85%	15%	*Pending	

*Pending with grant expected in Q4 2023

Regards,

Stefan Murphy
Zanthus Resources Pty Ltd
CZR Resources - Managing Director

Mark Gareth Creasy
Zanf Pty Ltd Sole Director

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Supplement B - Mine Closure Plan

Supplement C - Sterilisation Report

Supplement D - Stakeholder Register

Stakeholder Register is confidential, not for distribution or public review. To be supplied to DEMIRS separately.