



Eneabba Mineral Sands Mine

Application to Amend Native Vegetation Clearing Permit
CPS 6915/4 - Supporting Document

9 February 2022

Iluka Resources Ltd

Mining Lease 267SA

Vacant Crown Land (Victoria Location: 12562)

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Authorisation

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Table of Contents

1. PURPOSE	4
2. INTRODUCTION	4
2.1 LOCATION	4
2.2 BACKGROUND	4
2.3 OTHER APPROVALS	5
2.4 PURPOSE OF VEGETATION CLEARING	5
2.5 APPLICANT DETAILS	5
3. EXISTING ENVIRONMENT & POTENTIAL IMPACTS	9
3.1 TOPOGRAPHY AND SOILS	9
3.2 SITE VEGETATION AND FLORA	10
3.3 FAUNA	13
3.4 HYDROLOGY	15
3.4.1 Surface Water	15
3.4.2 Groundwater	15
3.5 CONSERVATION FEATURES	16
4. CLEARING PERMIT ASSESSMENT METHODOLOGY	16
4.1 SELECTION OF THE AMENDMENT AREA	16
5. IMPACTS AND MANAGEMENT MEASURES	17
5.1 LAND CLEARING	17
5.2 LOSS OF HABITAT AND BIODIVERSITY	17
5.3 INTRODUCTION AND SPREAD OF <i>PHYTOPHTHORA</i> DIEBACK AND WEEDS	18
6. ASSESSMENT AGAINST THE 10 CLEARING PRINCIPLES	21
7. CONCLUSION	25
8. REFERENCES	26

List of Tables

Table 1: Mitigation and Management Measures for Impacts from Land Clearing	17
Table 2: Mitigation and Management Measures for Impacts from Loss of Habitat and Biodiversity	18
Table 3: Mitigation and Management Measures for Impacts from Spread of Weeds	19
Table 4: Assessment against 10 Clearing Principles	21

List of Figures

Figure 1: Eneabba Project Location	6
Figure 2: CPS 6915/4 Approved Permit Area	7
Figure 3: CPS 6915/4 Proposed Amendment Area	8
Figure 4: Flora and Vegetation	11
Figure 5: Flora and Vegetation – Proposed Amendment Area	12
Figure 6: Fauna Habitat	14
Figure 7: Dieback occurrence within the clearing permit area	20

List of Appendices

Appendix 1: NVCP Amendment Application Form and Fee

Abbreviations

Acronym	Meaning
DAWE	Department of Agricultural, Water and the Environment
DBCA	Department of Biodiversity, Conservation and Attractions
DER	Department of Environment Regulation (now DWER)
DMIRS	Department of Mines, Industry Regulation and Safety
DWER	Department of Water and Environmental Regulation
EP Act	<i>Environmental Protection Act 1986</i>
EPA	Environmental Protection Authority
EPBC Act	<i>Environmental Protection and Biodiversity Conservation Act 1999</i>
ERER	Eneabba Rare Earth Refinery
FCT	Floristic Community Types
Iluka	Iluka Midwest Ltd (a wholly owned subsidiary of Iluka Resources Ltd)
MSP	Minerals Separation Plant
NVCP	Native Vegetation Clearing Permit
PASS	Potential Acid Sulfate Soils
PWD	Process Water Dam
TEC	Threatened Ecological Community
TSF	Tailings Storage Facility
WSP	Wet Screening Plant

1. PURPOSE

The purpose of this document is to provide an assessment of environmental impacts in accordance with the ten clearing principles as outlined in 'A guide to the assessment of applications to clear native vegetation' (DER 2014) to support a native vegetation clearing permit (NVCP) amendment application.

This application is proposing to amend the approved CPS 6915/4 (purpose permit) at Iluka Resources Ltd Eneabba Operations (Figure 1). CPS 6915/4 was granted in October 2020 to allow the clearing of 49.64 ha of native vegetation for the purposes of construction, mineral sands processing and rehabilitation activities. The objective of this amendment is to increase the area of clearing by 5.4 ha to a total of 55.04 ha to allow the construction of a Rare Earth Refinery in accordance with the existing purpose.

Referral of this amendment application to the Department of Mines, Industry Regulation and Safety's (DMIRS) Native Vegetation Assessment Branch is required to enable assessment of the amendment under Section 51 (Part V) of the *Environment Protection Act 1986* (EP Act). This information is provided with reference to the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004* as well as the (then) Department of Environmental Regulation's (DER) guideline to assessing the clearing of native vegetation (under Part V Division 2 of the EP Act) (DER 2014). The application form and fee for the clearing permit amendment is provided in Appendix 1.

2. INTRODUCTION

2.1 Location

Iluka's Eneabba Mine Site is located to the south-east of the town of Eneabba on the Brand Highway, approximately 280 kilometres (km) north of Perth and 150 km southeast of Geraldton, within the Shire of Carnamah (see Figure 1). Mining and processing of mineral sands has been undertaken by several companies at Eneabba for over 40 years. Mining ceased at Eneabba in March 2013, and the site is currently under active rehabilitation.

The area subject to this amendment is located within the *Iluka Mineral Sands (Eneabba) Agreement Act 1975*, Mining Lease 267SA, and on Vacant Crown Land (Victoria Location: 12562).

2.2 Background

Iluka Resources Limited, since the 1970s, have carried out mineral sands mining at the Eneabba Mine site. Mining and rehabilitation activities have occurred on the area of Mining Lease 267SA, granted under the *Mineral Sands (Eneabba) Agreement Act 1975* (WA) (Figure 1).

Mineral sands processing has occurred at Iluka's Narngulu Mineral Separation Plant (MSP) located 10 km from Geraldton, since 1975. By-product from processing at the Narngulu MSP is transported 150 km by road from Narngulu to Eneabba for storage. The by-product stockpile at Eneabba has been characterised as an ore reserve of 827,000 tonnes grading 83.5% Heavy Mineral of which 21.5% is the rare-earth bearing mineral monazite.

In 2019, Iluka initiated the Eneabba Project to process stockpiled monazite material. Implementation of the Eneabba Project has been staged with processing of the monazite ore split into three salable product phases:

- Phase 1 - Wet Screening Plant (WSP): Physical processing (washing and screening) of stockpiled monazite material to remove sand and clay and produce a Mineral Sands Concentrate with about 20% monazite content.
- Phase 2 - Concentrator: Concentrating of the Mineral Sands Concentrate from Phase 1 to produce two upgraded products using flotation and wet gravity separation methods. The majority of the Phase 2 plant output (80%) will be a heavy mineral concentrate product containing primarily zircon and ilmenite which is recovered for further processing at Iluka's other Western Australian processing plants or for direct sale. The remaining 20% will be a monazite rich heavy mineral containing about 90% monazite which is suitable as feed stock for rare earth refineries.
- Phase 3 - Refinery: Refining of the rare earth concentrate from the Phase 2 plant and other third-party rare earth concentrates to produce rare earth oxides and carbonates (Eneabba Rare Earth Refinery [ERER]).

2.3 Other Approvals

The Eneabba Phase 1 Project commenced operations in April 2020. The Eneabba Phase 2 Project was approved in April 2021 under Part V of the EP Act and is currently under construction, with operations planned to commence in 2022.

Phase 3 of the Project (ERER) was referred to the Environmental Protection Authority (EPA) under Section 38 of the EP Act on 26 October 2021. The EPA determined on the 5 January 2022 that Proposal would not to be assessed under Part IV of the EP Act (Decision: s. 38G(1) – Not Assess).

The ERER Project was referred to the Commonwealth Department of Agriculture, Water and the Environment (DAWE) under the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) on 16 November 2021. The delegate of the Commonwealth Minister for the Environment determined on the 12 January 2022, that the proposed action is Not a Controlled Action for the purposes of the EPBC Act.

A Works Approval Application was submitted for the Project for approval to the Department of Water and Environmental Regulation (DWER) on the 20 January 2022 (W6641/2022/1). Any potential impacts associated with construction and/or operation of the ERER Project are described in this approval and the subsequent licence amendment.

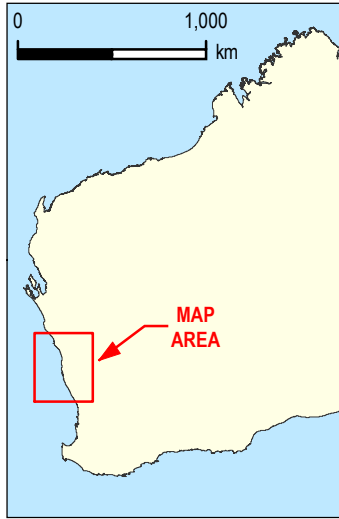
2.4 Purpose of Vegetation Clearing

To construct and operate the ERER Project, clearing of the Proposed Amendment Area consisting of 5.4 ha of rehabilitated land supporting native vegetation (shrubland and heathlands) and regrowth native vegetation established on topsoil stockpiles is required. The CPS 6915/4 Approved Permit Area is shown in Figure 2. The location of the ERER Project and Proposed Amendment Area are shown in Figure 3. The method of clearing will remain the same as the original clearing permit. The clearing is proposed to be undertaken in Q2 2022, subject to environmental approvals and operational requirements.

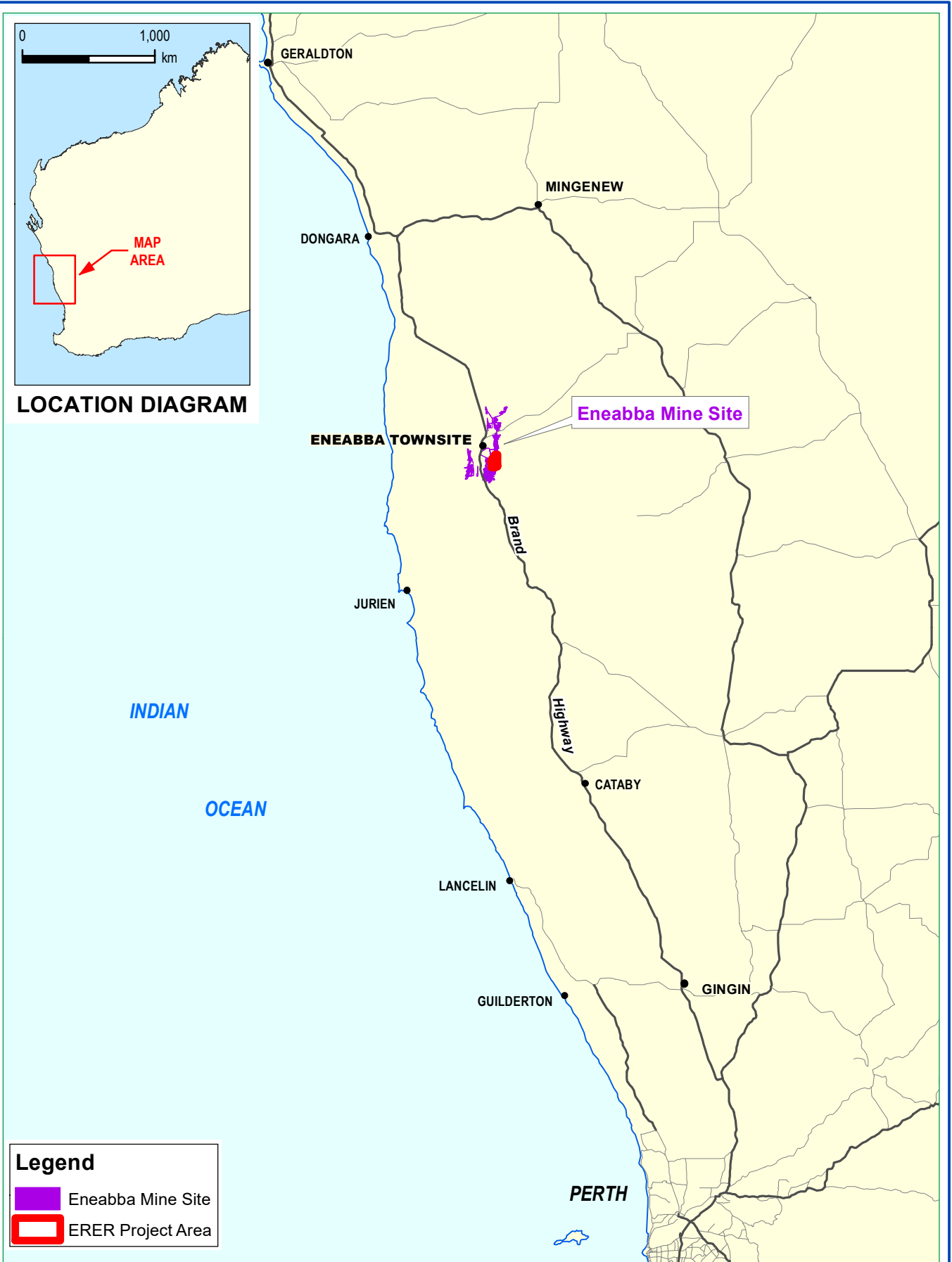
2.5 Applicant Details

Iluka Resources Ltd is responsible for the implementation of the clearing described within this document. Correspondence relating to this NVCP amendment should be addressed to:

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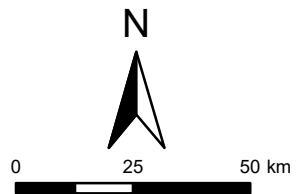


LOCATION DIAGRAM



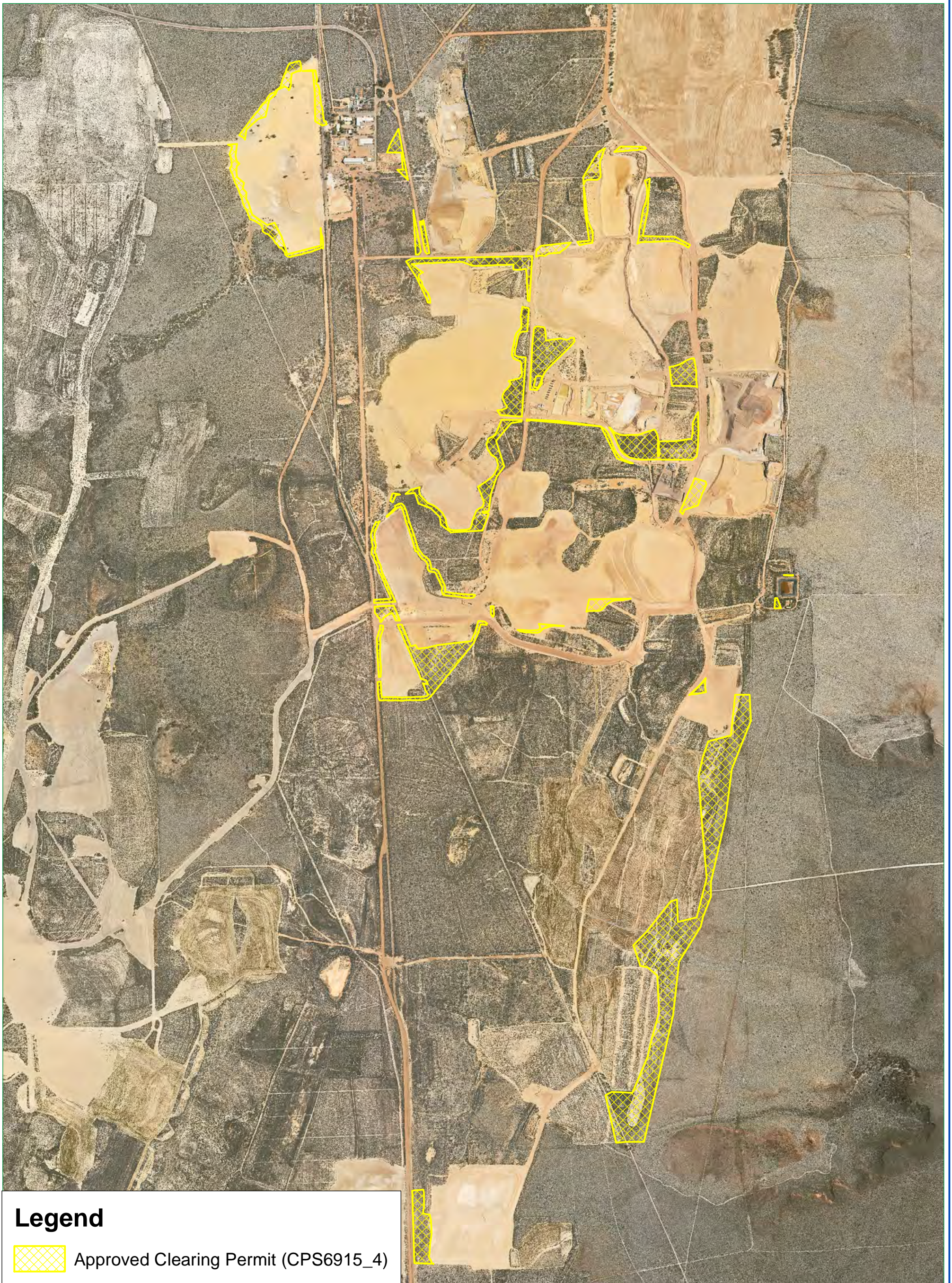
Legend

- Eneabba Mine Site
- ERER Project Area

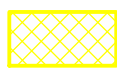


**ENEABBA RARE EARTH REFINERY
PROJECT LOCATION**





Legend

 Approved Clearing Permit (CPS6915_4)

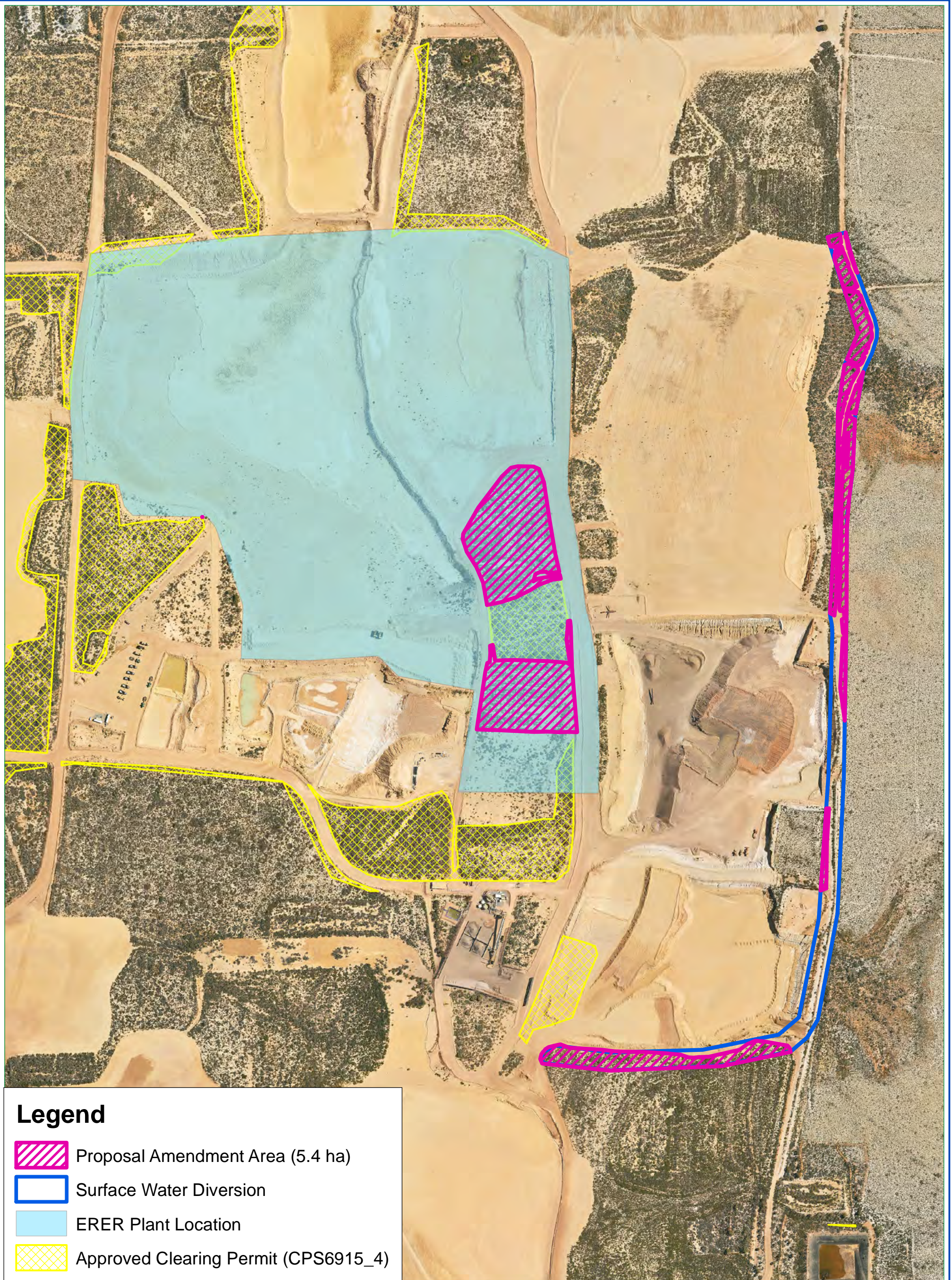


0 Meters 540




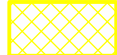
**ENEABBA RARE EARTH REFINERY
CPS6915/4 Amendment Application
Approved Permit Area**



ILUKA



Legend

-  Proposal Amendment Area (5.4 ha)
-  Surface Water Diversion
-  ERER Plant Location
-  Approved Clearing Permit (CPS6915_4)



0 Meters 150

**ENEABBA RARE EARTH REFINERY
CPS6915/4 Amendment Application
Proposed Amendment Area**



FIGURE:3

3. EXISTING ENVIRONMENT & POTENTIAL IMPACTS

The Proposed Amendment Area is located within a highly disturbed brownfields mine site with no nearby surrounding sensitive receptors. The existing environment information has not changed from that described in previous CPS 6915 application supporting documents and decision reports. Therefore only key points are summarised in the following sections.

The ERER Project design has focused on minimising impacts to flora, vegetation and fauna habitat to the greatest extent possible. As such, no remnant vegetation will be cleared for the Project. Only a small area (5.4 ha) of rehabilitated land supporting native vegetation (shrubland and heathlands) and regrowth native vegetation established on topsoil stockpiles is required to be disturbed for construction of the ERER Project.

3.1 Topography and Soils

Surveys of the Proposed Amendment Area have shown the elevation generally slopes gently from a north easterly direction (123 mAHD) to the south-west (120.5 mAHD).

The Eneabba mineral sands deposits are located on the north western extremities of the Swan Coastal Plain, to the west of the Gingin Scarp and the Dandaragan Plateau. The mineral sand deposits primarily occur in unconsolidated Quaternary coastal sediments and alluvium west of the Gingin Scarp, in an area referred to as the Eneabba Plain. Aeolian dunal depositions of white or yellow sands occur over part of the area.

Undisturbed soils at Eneabba typically comprise an upper profile of sands and gravelly sandy clays at depth. The undisturbed sands include surface 'topsoil' sands with organic matter accumulation, grading down to yellow or pale, bleached sands. Gravelly sandy clays are present in gradational, duplex profiles containing 20 to 30% gravel.

As part of the rehabilitation process, soil profiles are reconstructed from stockpiled materials resulting from mining operations. The reconstructed soil profile within the Proposed Amendment Area is comprised of sandy topsoil, sand tailings, clay fines, co-disposed material with and without gravel, and coarse overburden at varying sequences and depths, and therefore are significantly different in their morphology and constitution compared to undisturbed soils within the area.

Soil Water Consultants (SWC) undertook an acid sulfate soils (ASS) survey in 2008 over the Eneabba Operations to identify whether there are any potentially acid sulfate soils (PASS). The assessment included a desktop study and broad scale drilling and sampling of areas where PASS may occur.

The soils consist of deep surficial sands to sandy clays overlying the Yarragadee Formation. The surficial soils are well oxidised and freely draining. The pedogenic and redoximorphic conditions are unsuitable for the formation or hosting of PASS, and therefore, no PASS is likely to occur. In areas immediately to the east of the Warradarge Fault, groundwater occurs in the basal portion of the surficial sediments creating a reducing environment. Although reducing conditions exist in this area, no PASS were identified during broad scale drilling and soil sampling (i.e. pH results typically >4) (SWC 2008).

The assessment determined that no PASS soils are likely to occur within the Eneabba mine site (SWC 2008).

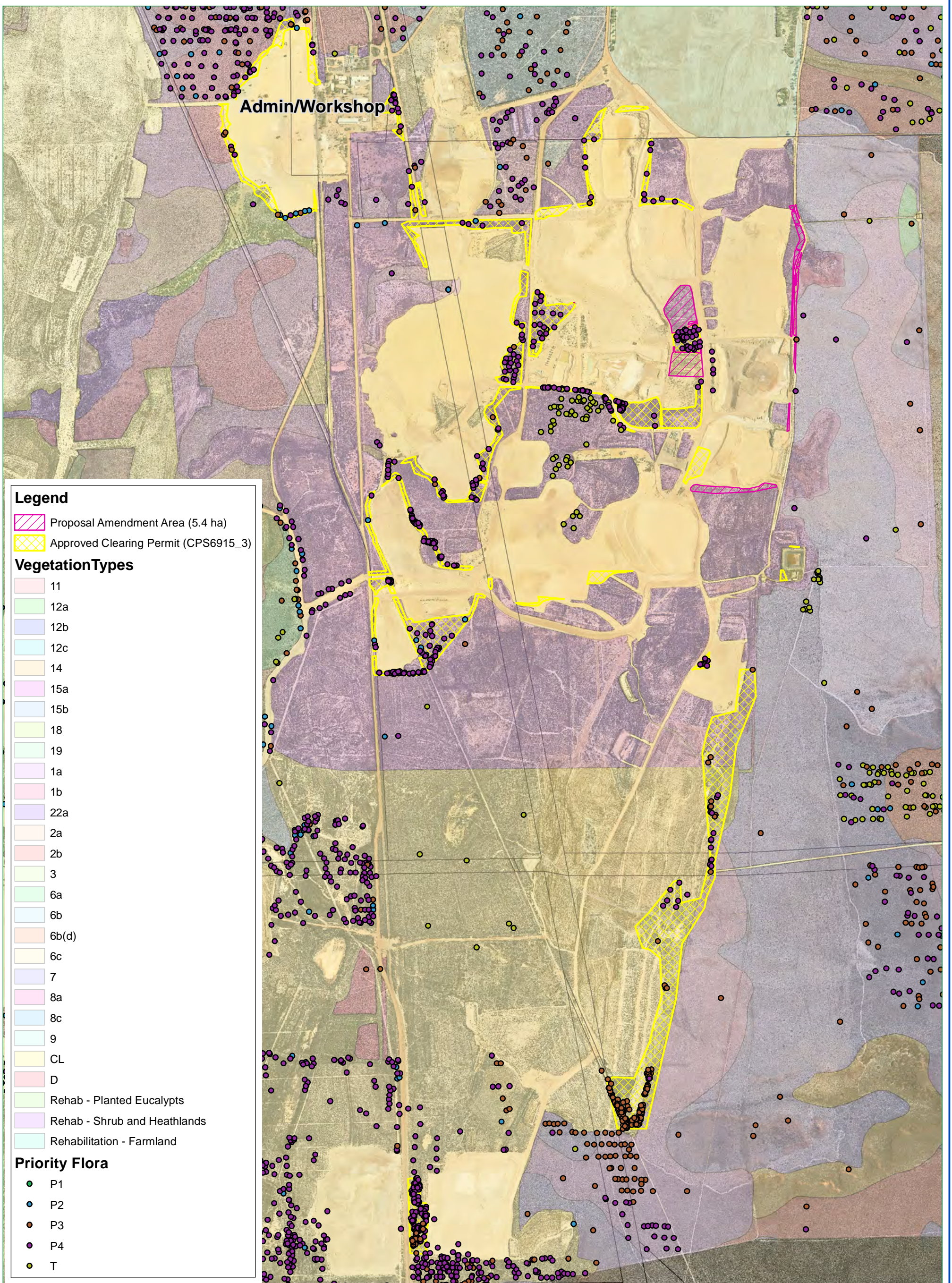
3.2 Site Vegetation and Flora

The Proposed Amendment Area is a small area (5.4 ha) of rehabilitated land supporting native vegetation (shrubland and heathlands) and regrowth native vegetation established on topsoil stockpiles, required to be disturbed for construction of the ERER Project.

A number of flora and vegetation surveys have been conducted in the Eneabba region over the course of the mining operations. These included baseline surveys of the vegetation community types within the Eneabba operations and surrounding regions, as well as targeted surveys to identify conservation significant flora within Iluka's mining operations.

The Umwelt 2021 study considered previous vegetation community mapping to evaluate the spatial extent of native vegetation communities within a broad Study Area and a more focused area. The vegetation types are referred to as Floristic Community Types (FCTs) within the Umwelt 2021 study. A total of 22 FCTs were identified within the greater Study Area, of which five are present within the ERER Project. Land classified as cleared or rehabilitated accounts for approximately 98.6% of the ERER Project. The FCTs are in Figure 4.

The Proposed Amendment Area will result in a direct impact on one significant flora species (*Eucalyptus macrocarpa* ssp. *elachantha*), which is classified by Department of Biodiversity, Conservation and Attractions (DBCA) as Priority 4. Locations of significant flora taxa within and adjacent to the Proposed Amendment Area are presented in Figure 5. Only one significant flora taxa (P4), in addition to those approved to be disturbed by CPS 6915/4, is located in Proposed Amendment Area. The identification of this species within the mine site rehabilitation areas indicates they can be effectively returned as part of proven rehabilitation works.



Admin/Workshop

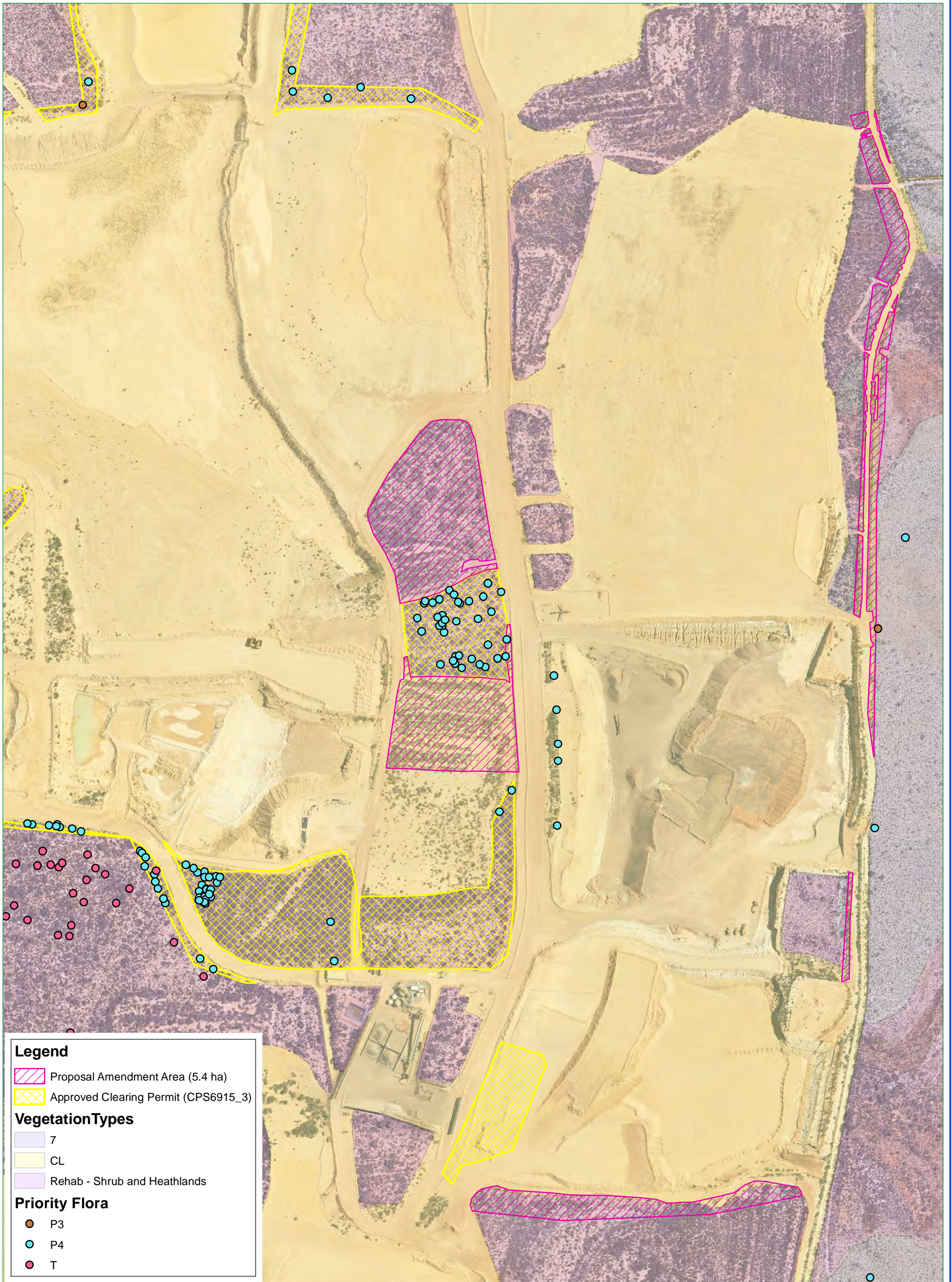
ENEABBA RARE EARTH REFINERY
Flora and Vegetation



ILUKA



0 0.1 0.2 0.3 0.4 0.5 km



Legend

- Proposal Amendment Area (5.4 ha)
- Approved Clearing Permit (CPS6915_3)

Vegetation Types

- 7
- CL
- Rehab - Shrub and Heathlands

Priority Flora

- P3
- P4
- T

N



0 25 50 75 100 125 Meters



**ENEABBA RARE EARTH REFINERY
Flora and Vegetation
Proposed Amendment Area**



ILUKA

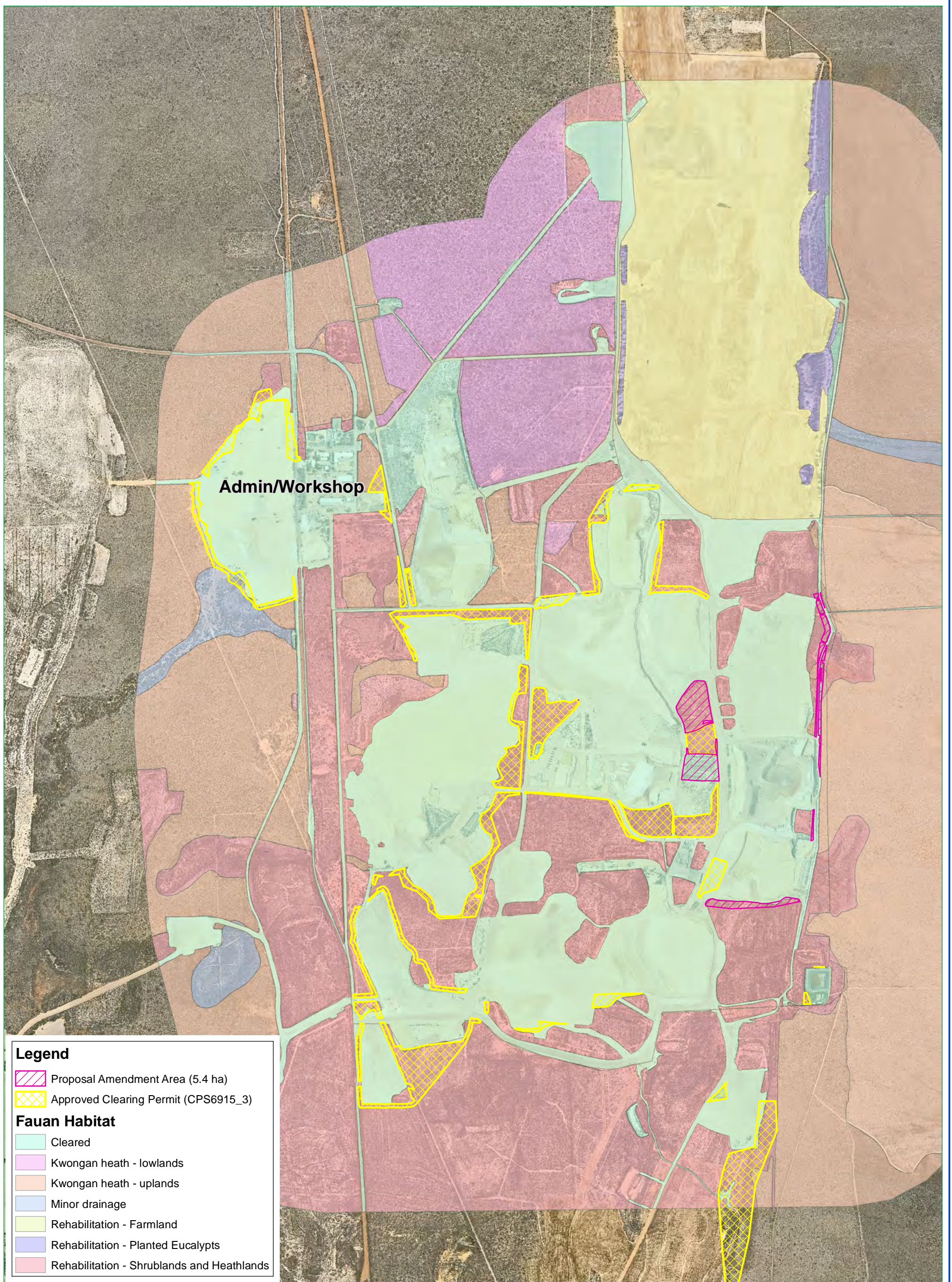
3.3 Fauna

The Proposed Amendment Area is a small area (5.4 ha) of rehabilitated land supporting native vegetation (shrubland and heathlands) and regrowth native vegetation established on topsoil stockpiles, required to be disturbed for construction of the ERER Project.

A number of fauna surveys have been conducted in the Eneabba region over the course of the mining operations. These include baseline surveys of undisturbed vegetation to characterise existing fauna and monitoring of fauna in rehabilitated areas.

Habitat mapping was undertaken using landform descriptions and vegetation mapping (created by Woodman Environmental Consulting in 2010), observations made by fauna personnel in the field and interpretation of aerial photography. Six fauna habitat types were identified within the survey area plus cleared land. These are displayed in Figure 5. The Proposed Amendment Area consists of rehabilitation (shrublands and heathlands) habitat.

Conservation significant fauna species, Carnaby's Cockatoo, has been recorded in the Proposed Amendment Area in either previous fauna studies or the 2021 assessment. Rehabilitation (Shrublands and Heathlands) habitat was identified as suitable foraging habitat for Carnaby's Cockatoos, with several individuals recorded actively utilising the habitats during the field surveys. More information is provided in Section 5.2 on this species.



Legend

- Proposal Amendment Area (5.4 ha)
- Approved Clearing Permit (CPS6915_3)

Fauna Habitat

- Cleared
- Kwongan heath - lowlands
- Kwongan heath - uplands
- Minor drainage
- Rehabilitation - Farmland
- Rehabilitation - Planted Eucalypts
- Rehabilitation - Shrublands and Heathlands

N



0 0.1 0.2 0.3 0.4 0.5 km



**ENEABBA RARE EARTH REFINERY
Fauna Habitat**



ILUKA

3.4 Hydrology

3.4.1 Surface Water

The ERER Project falls within the Logue Surface Water Catchment, which is served by watercourses that originate on the Dandaragan Plateau and Arrowsmith Region and drain into large swamps or lakes in interdunal depressions on the Swan Coastal Plain. The surface drainage pattern is towards the west reflecting the general slope of the landscape of the sedimentary basin.

Surface water flows are generally considered to be low in the Eneabba region due to the predominantly sandy nature of the surface soils and their corresponding high infiltration rates (SWC 2009). These sandy soils are associated with the Eneabba Plain, which consists of deep sands (up to 40 m deep) overlying the Yarragadee Formation. There are several ephemeral unnamed watercourses in the vicinity of the ERER Project, however one minor watercourse intersects the Proposed Amendment Area.

The catchments upstream of the ERER Project are relatively small and have vegetation that is re-establishing post recent bushfires. There are no developed areas within the upstream catchments. A 1 km-long drain is required to the east of the ERER Plant area to convey runoff to the south and into an existing natural depression. The Proposed Amendment Area will form part of the required surface water management controls which will divert surface water around the ERER Plant area.

3.4.2 Groundwater

The primary geological units of interest in the area around the ERER Project are the Quaternary aged Superficial formations, and the underlying Yarragadee Formation (a high yielding aquifer). Iluka abstracts groundwater from the Yarragadee Aquifer under two groundwater licences with a combined annual extraction limit of 11 GL issued under the *Rights in Water and Irrigation Act 1914*. The groundwater allocation is split across two licences because the mine and borefield traverse two groundwater management sub-areas within the Arrowsmith Groundwater Area: the Twin Hills sub-area (GWL 104709) and the Eneabba Plains sub area (GWL 104700).

Bore log information in the vicinity of the ERER Project indicate that the underlying sediments are comprised of a combination of sand, silt and clay. Laterite and cementing are also present. The silt and clay, laterite and cementing will impede vertical groundwater flow. Cementing is potentially an indication of the Yarragadee Formation, which has weakly-cemented characteristics at depth or in older parts. In the vicinity of the ERER Project the regional watertable is located within the Yarragadee Formation. Depth to groundwater is typically around 20 m and 3-5 m below the base of the Monazite Pit (Jacobs 2020).

Historical activities at the Eneabba mine site have modified the depth to groundwater and groundwater elevation near the mine. Impacts such as localised groundwater mounding from seepage of water from water storage facilities and historical clay fine tailings dams, along with groundwater drawdown at production borefield sites have been observed (Jacobs 2020). The persistence of mounding many years after the cessation of mining suggests the downward vertical flow through the uppermost Yarragadee Formation sediments has been impeded. In other words, a confining or leaky-confining layer of relatively low vertical hydraulic conductivity underlies the proposed Eneabba Phase 2 Process Water Dam (PWD) and In-Ground Tailings Storage Facilities (TSFs). These layers result in localised “perched water tables”.

The Eneabba town water supply (Priority 1 and 2 Eneabba Water Reserve) uses the regional aquifer (Yarragadee aquifer), and the current point of abstraction is located approximately 5.5 km north (cross hydraulic gradient) of the Proposal. The most northern In-Ground TSF is located 4.9 km from P1 Eneabba Water Reserve area and 2.6 km from the P2 Eneabba Water Reserve area (hydraulically cross gradient).

Agricultural use is a potential groundwater use within the ERER Project, as the salinity of the groundwater is such that it could be used for both stock and irrigation.

3.5 Conservation Features

The closest ESA is located approximately 250 m south west of the Proposed Amendment Area. This ESA correlates to the buffer of the Threatened Ecological Community (TEC) - (Rocky Springs Ferricrete). The only recorded Rocky Springs Ferricrete TEC is 5.3 km south east of the Proposed Amendment Area, however this TEC is restricted to ferricrete soils, which are unusual in the Eneabba area, and are easily recognisable (Woodman 2016b).

The Proposed Amendment Area is not mapped within any Regional Parks or DBCA Managed Lands, the closest Reserve is South Eneabba Nature Reserve, located 2 km south.

4. CLEARING PERMIT ASSESSMENT METHODOLOGY

To assess potential impacts of clearing the additional 5.4 ha of rehabilitated land supporting native vegetation (shrubland and heathlands) and regrowth native vegetation established on topsoil stockpiles for the purposes of construction of the ERER Project, the methodology used is described below, and in reference to the DER's guideline to assessing clearing of native vegetation (DER 2014):

- Review of the desktop flora and vegetation study completed for the ERER Project (Umwelt 2021) and ERER Project specific vertebrate fauna survey and targeted cockatoo habitat survey (Western Wildlife 2021);
- Review of DMIRS decision reports for CPS 6915/1, CPS 6915/2, CPS 6915/3 and CPS 6915/4; and
- Undertake an assessment of the clearing of additional 5.4 ha against the ten clearing principles as assessed in CPS 6915/4 (Table 4).

4.1 Selection of the amendment area

Iluka have applied avoidance and mitigation options to avoid, minimise or otherwise mitigate the scale of the proposed clearing for the ERER Project. As a result no clearing of remnant native vegetation is proposed and 5.4 hectares of rehabilitated land supporting native vegetation (shrubland and heathlands) and regrowth native vegetation established on topsoil stockpiles is proposed to be cleared within the Proposed Amendment Area.

The Proposed Amendment Area was selected to be cleared for the ERER Project based on proximity to the existing processing facilities (50 m south) and proximity to existing voids for the disposal of waste material associated with the ERER Project. Close proximity to these existing areas was prioritised to ensure the minimum disturbance footprint possible and thus the containment of any potential impacts to the smallest area possible.

Clearing will be undertaken in accordance with Iluka's standard clearing practices including:

- completion of a Ground Disturbance Permit that is reviewed and approved by site environmental personnel;
- survey and demarcation of clearing boundaries;
- marking of any plants to be retained (e.g. Priority flora on the edges of the clearing boundary);
- supervision of clearing activities; and
- verification that clearing was undertaken in accordance with the Ground Disturbance Permit and approved NVCP.

5. IMPACTS AND MANAGEMENT MEASURES

Environmental impacts at the Eneabba mine site have been identified over the life of operations. Annual and triennial environmental reports prepared and submitted under the *Mineral Sands (Eneabba) Agreement Act 1975* outline environmental management activities for a range of environmental factors. These include, land clearing, dust, *Phytophthora* dieback, groundwater, surface water and rehabilitation. In addition, risk registers and management plans are regularly reviewed and updated. The key environmental impacts associated with the clearing for mineral sands processing and their proposed management measures are described in detail below.

5.1 Land Clearing

5.4 ha of clearing is proposed to occur to enable construction for the EREER Project. The clearing area (Proposed Amendment Area) was selected to maximise the use of existing cleared areas whilst still being in close proximity to the required existing processing facilities. The vegetation located within the Proposed Amendment Area is generally in poorer condition than the surrounding intact vegetation due to the presence of wind-blown sand and deposition of sediment from run-off. Once the EREER Project ceases, these areas will be rehabilitated in accordance with standard Iluka rehabilitation practices. It is anticipated that the subsequent rehabilitation of these areas will improve overall vegetation condition.

Table 1: Mitigation and Management Measures for Impacts from Land Clearing

Potential Impact	Mitigation and Management Measures
Clearing of vegetation leading to soil erosion	<ul style="list-style-type: none"> • Site selected to minimise clearing and make use of existing cleared areas • Plant design considerations to minimise project footprint • Progressive clearing and rehabilitation
Altered drainage patterns, leading to inundation or increased erosion (wind or water) resulting in impacts to surface water	<ul style="list-style-type: none"> • Design considerations to minimise project footprint to reduce the amount of potential runoff during storms • Installation of a surface water drain to divert surface water flows around the EREER plant area. • Progressive rehabilitation to minimise exposed areas resulting in wind erosion • Consideration of surface water drainage during construction to ensure all run-off from the plant area is contained within the operational footprint and/or directed to the process water dam • Perimeter windrow around the plant area to capture and contain stormwater run-off, site will be internally draining.

5.2 Loss of Habitat and Biodiversity

The clearing within the Proposed Amendment Area will result in the temporary loss of habitat and minor impact on diversity. This is because the vegetation in this area does not support a rich biodiversity, given it is made up of regrowth vegetation on topsoil stockpiles and rehabilitation vegetation that is in a degraded condition. One location of a priority species (P4) will be disturbed during clearing within the Proposal Amendment Area, which is not considered significant.

The Proposed Amendment Area of 5.4 ha does not provide breeding or roosting habitat for Carnaby's Cockatoo. The greater Eneabba Mine site area contains rehabilitated areas that provide foraging habitat for Carnaby's Cockatoo, noting that the foraging values are variable within rehabilitation areas within the greater Eneabba Mine site area dependent on factors such as time since rehabilitation, species re-established and vegetation condition. 5.4 ha of potential foraging habitat

is partially rehabilitated shrubland and heathland and regrowth on topsoil stockpiles that will be disturbed as a result of implementation of the ERER Project which is insignificant considering the high value foraging habitat within 12 km of the ERER Project. Carnaby's Cockatoo's have been observed foraging in rehabilitated areas within the mine site giving confidence that foraging habitat can be reinstated as part of future rehabilitation actions. The impact on Carnaby's Cockatoo habitat has been assessed by DAWE as part of the EPBC Act Referral (Section 2.3). The Project was determined to be 'Not a Control Action', indicating that impact to potential Carnaby's Cockatoo habitat was not significant.

Table 2: Mitigation and Management Measures for Impacts from Loss of Habitat and Biodiversity

Potential Impact	Mitigation and Management Measures
Direct loss of rehabilitation vegetation and significant flora species during clearing	<ul style="list-style-type: none"> • Site selected to minimise clearing and make use of existing cleared areas • Design considerations to minimise project footprint • Progressive clearing and rehabilitation • Land disturbance permit system • Inductions will include flora awareness and clearing permit requirements • Flora and vegetation surveys completed to identify most sensitive areas and avoid these where possible
Indirect loss or degradation of rehabilitation vegetation from introduction or spread of weeds	<ul style="list-style-type: none"> • Implementation of Weed Management Plan • Weeds and seeds cleaning procedures for all vehicles and machinery coming onto site
Indirect impacts from dust emissions/deposition leading to degradation of rehabilitation vegetation	<ul style="list-style-type: none"> • Implementation of Eneabba Dust Management Plan • Water cart application during construction and operational activities • Daily visual inspections to monitor dust emissions and adjust activities accordingly
Indirect loss or degradation of rehabilitation vegetation from chemical spill	<ul style="list-style-type: none"> • Concreted bunded chemical storage area • Site layout, design and engineering controls remove emission sources

5.3 Introduction and Spread of *Phytophthora* Dieback and Weeds

Phytophthora Dieback is known to occur within portions of the CPS6915/4 Clearing Permit Area which contains infested areas, uninfested areas and yet to be interpreted areas (Figure 6). The Proposed Amendment Area is classified as 'yet to be determined' or uninfested.

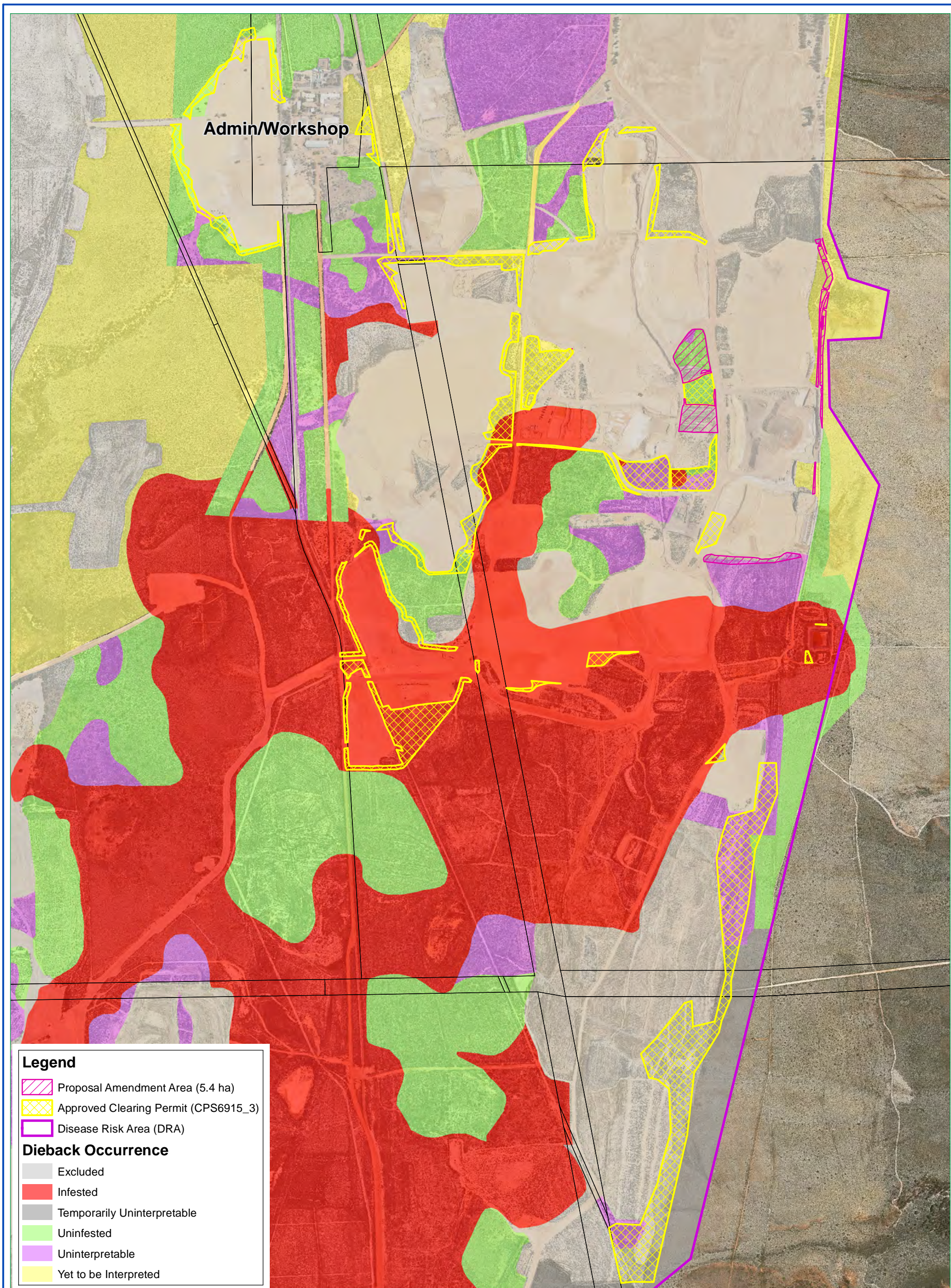
The management of *Phytophthora* Dieback in rehabilitation areas is detailed within Iluka's *Phytophthora* Dieback Management Plan – Eneabba Operations (Iluka 2016) which was approved by the OEPA in September 2016. Since 1991, Iluka has implemented hygiene management to prevent the spread of *Phytophthora* Dieback and will continue to implement these management actions. Dieback hygiene measures specific to the clearing activity required for the Eneabba Upgrade Project will be developed and implemented prior to disturbance. It is considered unlikely that clearing the Proposed Amendment Area will result in the spread of *Phytophthora* Dieback or the spread of weeds.

Table 3: Mitigation and Management Measures for Impacts from Spread of Weeds

Potential Impact	Mitigation and Management Measures
Indirect loss or degradation of rehabilitation vegetation from introduction or spread of dieback	<ul style="list-style-type: none"> • Implementation of Eneabba Dieback Management Plan (e.g. vehicle and personnel hygiene procedures) • Ongoing monitoring/assessments of infestations • Consideration of surface water drainage during construction to ensure all run-off from the plant area is contained within the operational footprint and/or directed to the process water dam
Indirect loss or degradation of rehabilitation vegetation from introduction or spread of weeds	<ul style="list-style-type: none"> • Weed Management Plan • Weeds and seeds cleaning procedures for all vehicles and machinery

The management of *Phytophthora* Dieback in areas being rehabilitated is in accordance with the Dieback Management Plan. Final rehabilitation will consider:

- whether the disease status of the area was known prior to disturbance;
- soil disturbance history;
- where the topsoil and subsoil have been stockpiled; and
- whether the area being rehabilitated is protectable from infestation through autonomous spread.

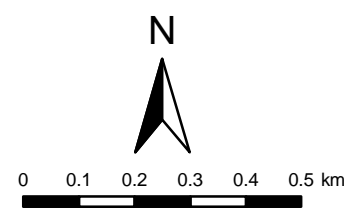


Legend

- Proposal Amendment Area (5.4 ha)
- Approved Clearing Permit (CPS6915_3)
- Disease Risk Area (DRA)

Dieback Occurrence

- Excluded
- Infested
- Temporarily Uninterpretable
- Uninfested
- Uninterpretable
- Yet to be Interpreted



ENEABBA RARE EARTH REFINERY
Diesback occurrence within
the Clearing Permit area



6. ASSESSMENT AGAINST THE 10 CLEARING PRINCIPLES

The impacts of clearing under this proposal are discussed below with regard to the 10 Clearing Principles as defined in DER’s Guide to Assessment: Clearing of Native Vegetation under the EP Act. The assessment of the proposed clearing against the clearing principles remains primarily consistent with DMIRS original assessment contained in decision report CPS 6915/1 and therefore only potential changes from the change in purpose are discussed in detail. It should be noted that the method of clearing, mechanical removal, will remain the same.

Table 4: Assessment against 10 Clearing Principles

Principle	Assessment (as per original CPS6915/1 application)	Assessment of proposed amendment	Outcome
<p>Principle (a) – Native vegetation should not be cleared if it comprises a high level of biological diversity</p>	<p><i>The area described in this proposal lies within the Geraldton Sandplains Interim Biogeographical Regionalisation for Australia (IBRA) bioregion, specifically within the Lesueur Sandplain subregion. This subregion is recognised for its high level of biodiversity, and in particular floral diversity and endemism (Desmond & Chant 2001). This is reflected in the results of flora and vegetation surveys of Iluka’s NSR area, with 940 vascular plant taxa recorded in this area, and 30 FCTs described and mapped (Woodman Environmental 2010).</i></p> <p><i>Clearing under this proposal is likely to have a minimal impact on the overall biodiversity of the Lesueur Sandplain subregion and the local area within which the Clearing Permit Area is located. The vegetation itself is also of poorer quality than the surrounding vegetation, with clearing being aimed at areas which are on the edge or in between cleared and rehabilitated areas, and where damage to vegetation in the form of windblown sand and sediment deposition has occurred. The Clearing Permit Area will be incorporated into new rehabilitation areas.</i></p> <p><i>The areas proposed to be cleared are relatively small, in generally poorer condition in comparison to nearby native vegetation, and located adjacent to existing cleared areas, and are themselves not particularly biodiverse. This proposal is therefore not considered to be at variance to this principle.</i></p>	<p>No change.</p> <p>The additional areas to be cleared are relatively small areas of regrowth or rehabilitated land supporting native vegetation (shrubland and heathlands). Impacts on significant flora will be minimal in the local and regional context with only one location of a Priority 4 flora species directly impacted. The impacted flora species has been observed in rehabilitated areas within the mine site giving confidence they can be reinstated as part of future rehabilitation actions. Iluka have rehabilitated disturbed areas of the Eneabba mine site back to native vegetation, with the Priority 4 flora species directly impacted by the Proposed Amendment Area being observed in rehabilitated areas. Knowledge about effective rehabilitation techniques has increased during the mine life and current rehabilitation activities reflect the continuous improvement approach. As such, Iluka believes native vegetation can be sustainably re-established through rehabilitation commitments.</p>	<p>The Amendment is unlikely to be at variance with this Principle.</p>
<p>Principle (b) – Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a significant habitat for fauna indigenous to Western Australia</p>	<p><i>Three of the FCTs to be cleared are relatively common and widespread in the Iluka NSR, with both being mapped over more than 1,000 ha (Table 1 of Appendix 4), with a smaller amount of the remaining FCT (FCT 18) mapped. Clearing as a result of this proposal will represent a relatively small impact to each FCT (< 5 % of each FCT to be impacted; Table 1 [of Appendix 4]). There is also extensive neighbouring native vegetation where migratory and itinerant fauna can relocate to.</i></p> <p><i>Many of the conservation significant fauna listed in Table 3 (in Appendix 4) are unlikely to be present, or only present as vagrants within the Clearing Permit Area, due to the limited range of habitats, small areas proposed to be cleared located adjacent to larger cleared areas, and the poorer condition of the vegetation in comparison to nearby large tracts of native vegetation. Consequently, clearing of vegetation under this proposal is not expected to have a regional impact on any of the conservation significant fauna.</i></p> <p><i>Conservation significant fauna that may be regularly associated with the area proposed for mulch harvesting are discussed in detail on pages 10-11 of Appendix 4. The proposed clearing is not considered to be at variance to this principle.</i></p>	<p>No change.</p> <p>The Proposed Amendment Area contains rehabilitated and regrowth areas that provide foraging habitat for Carnaby’s Cockatoo, noting that the foraging values are variable within rehabilitation areas within the Proposed Amendment Area dependent on factors such as time since rehabilitation, species re-established and vegetation condition. 5.4 ha of potential foraging habitat is partially rehabilitated shrubland and heathland and regrowth on topsoil stockpiles that will be disturbed as a result of implementation of the ERER Project which is insignificant considering the high value foraging habitat within 12km of the Proposal. The impact to Carnaby’s Cockatoo habitat has been assessed by DAWE as part of the EPBC Act Referral (Section 2.3). The Project was determined to be ‘Not a Control Action’, indicating that impact to potential Carnaby’s Cockatoo habitat was not significant.</p>	<p>The Amendment is unlikely to be at variance with this Principle.</p>

Principle	Assessment (as per original CPS6915/1 application)	Assessment of proposed amendment	Outcome
<p>Principle (c) – Native vegetation should not be cleared if it includes or is necessary for the continued existence of rare flora.</p>	<p><i>A significant flora survey of the Clearing Permit Area in 2015 recorded 16 significant flora taxa, however no extant Threatened taxa individuals were recorded. Five individuals of Leucopogon obtectus are historically known within the Clearing Permit Area, and were previously marked and GPS points taken. Each of these five locations were inspected, and no individuals remain. However, a general decline in the health of individuals of this taxon over time has been noted, and recruitment of new individuals may be lacking due to stimulus such as fire in the area. Viable seed may occur in the surrounding soil, and as such there may be impact to this taxon as a result of clearing.</i></p> <p><i>It is unlikely that Paracaleana dixonii will be impacted, as no individuals of this taxon were identified during the survey. The survey was undertaken during the most appropriate time of year for survey; individuals of this taxon were recorded during the same time period as the current survey was undertaken to the east (Lake Logue) and north (Dongara), and therefore if individuals were flowering and present in the Clearing Permit Area it is likely that they would have been recorded. A brief impact assessment with regards to habitat of these taxa was presented in Section 3.1.2 (of Appendix 4). The percentage impact to habitat for both of these taxa was very low (approximately 0.1% of habitat within the Iluka NSR).</i></p> <p><i>The potential impacts to Priority flora taxa in the Clearing Permit Area are therefore not considered to be significant, with any impacts likely to be temporary.</i></p>	<p>No change.</p> <p>The change in purpose will not introduce any new or additional impacts given that no declared rare or threatened flora will be cleared and the impacts to priority species is considered negligible given the large numbers of the species occurring elsewhere across the Northern Sandplain Region. The amendment area will be rehabilitated resulting in an improved rehabilitation state.</p>	<p>The Proposal is unlikely to be at variance with this Principle.</p>
<p>Principle (d) – Native vegetation should not be cleared if it comprises the whole or a part of or is necessary for the maintenance of a Threatened Ecological Community (TEC).</p>	<p><i>There are no occurrences of any Threatened Ecological Community (TEC) or Priority Ecological Community (PEC) within the Proposed Amendment Area. The closest occurrence of a known TEC or PEC is approximately 4.5 km to the west (Ferricrete Floristic Community (Rocky Springs Type) TEC) (DBCA 2020), however this TEC is restricted to ferricrete soils, which are unusual in the Eneabba area, and are easily recognisable. Therefore, no TECs or PECs will be impacted by this proposal and therefore the proposal will not be at variance with this principle.</i></p>	<p>No change.</p>	<p>The Amendment will not be at variance with this Principle.</p>
<p>Principle (e) – Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared</p>	<p><i>The proposed clearing area is located within the IBRA Geraldton Sandplains Subregion (GESO2), where 85.18 % of the pre-European extent of vegetation remains (Government of Western Australia 2014); therefore, more than 30% of the pre-European extent of this subregion is extant.</i></p> <p><i>The proposed clearing area represents several small, degraded areas of native vegetation and mining rehabilitation vegetation surrounded by cleared areas at the Eneabba Mine Site. There are extensive tracts of uncleared land to the west and to the east of the mine site, including VCL and the South Eneabba Nature Reserve. The Clearing Permit Area does not represent an area that is significant as a remnant of native vegetation in an area that has been extensively cleared.</i></p> <p><i>The proposed clearing is not at variance to this principle.</i></p>	<p>No change.</p> <p>The change in purpose will not introduce any new or additional impacts given the method of clearing is the same and the area does not represent an area that is significant as a remnant of native vegetation in an area that has been extensively cleared and is not representative of the pre-European Lesueur Sandplains that once occurred in the area.</p>	<p>The Proposal is unlikely to be at variance with this Principle.</p>
<p>Principle (f) – Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.</p>	<p><i>There are no watercourses or wetlands associated with the Clearing Permit Area. The proposed clearing is not at variance to this principle.</i></p>	<p>No change.</p>	<p>The Proposal will not be at variance with this Principle.</p>

Principle	Assessment (as per original CPS6915/1 application)	Assessment of proposed amendment	Outcome
<p>Principle (g) – Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation</p>	<p><i>The clearing proposed is to enable final rehabilitation landform shaping and drainage control, with a secondary purpose being to use the harvested material as mulch material in rehabilitation works. Although there may be a small window of increased open area as a result of the clearing, final earthworks and subsequent rehabilitation should improve the existing degradation including deposition of wind-blown sand and sedimentation from existing cleared landforms.</i></p> <p><i>The proposed clearing is not at variance to this principle.</i></p>	<p>No change.</p> <p>The additional clearing areas may introduce additional impacts from sediment deposition or erosion via surface water runoff or through the introduction of weeds or dieback.</p> <p>The clearing within the Proposed Amendment Area is of a small scale and is considered degraded native rehabilitation vegetation and regrowth on topsoil stockpiles. A weed management plan and dieback management plan will be in place during clearing activities which will describe the required hygiene procedures for vehicles, machinery and personnel washdown before entering and leaving the site. The clearing area is not prone to waterlogging and therefore the temporary removal of vegetation will not result in exacerbation of waterlogging. The area will be rehabilitated at the end of the project. The Proposed Amendment Area has been designed to occupy the minimal area possible, including considerations for surface water runoff (e.g. perimeter bunds and drainage to sumps. Iluka has extensive experience in rehabilitating vegetation in the Eneabba region and therefore the land will be returned to agreed rehabilitation objectives and therefore the clearing is not likely to cause appreciable land degradation.</p>	<p>The Proposal is unlikely to be at variance with this Principle.</p>
<p>Principle (h) – Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area</p>	<p><i>The Proposed Amendment Area does not intersect any conservation areas and is located on more degraded vegetation surrounding cleared areas, and rehabilitation areas. The South Eneabba Nature Reserve is located 2 km to the south, however is separated by mining infrastructure and intact native vegetation on Vacant Crown Land (VCL). Therefore there will be no impact to this reserve.</i></p> <p><i>The proposed clearing is not at variance to this principle.</i></p>	<p>No change.</p> <p>The Eneabba dieback and weed management plans will be implemented.</p>	<p>The Proposal will not to be at variance with this Principle.</p>
<p>Principle (i) – Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water</p>	<p><i>The end result of the works (i.e. rehabilitation landform shaping and drainage control) should improve the sediment loads which are currently being experienced in some areas near the cleared areas of the Eneabba Mine Site. It is not considered that the proposal will cause any further deterioration in the quality of surface water at the Mine Site. No impact to groundwater quality or levels will be experienced as a result of the proposal.</i></p> <p><i>The proposed clearing is not at variance to this principle.</i></p>	<p>No change.</p> <p>The Proposed Amendment Area is not within a Public Drinking Water Surface Area (PDWSA), with the nearest drinking water source area is the Eneabba Water Reserve (Priority 2), located 4.5 km north. There are no water surface features that intersect or are nearby to the Proposed Amendment Area.</p> <p>The ERER Project operations will not intercept groundwater. The Project site has been designed to capture and contain surface-water runoff (via perimeter bunds) and is internally draining; so not to interact and potentially decrease the quality of surface water run-off in surrounding areas. The ERER Project footprint will be either concrete bunded or bituminised so the risk of contamination is negligible. The chemical storage area will also be concrete bunded. Groundwater quality monitoring is undertaken on a quarterly basis in according with the current environmental operating licence (L5646/1994/10). Given the small clearing area, the degraded nature of the vegetation, the lack of surface water features and the depth to groundwater - it is not likely that the change in purpose of clearing will deteriorate the quality of surface or groundwater.</p>	<p>The Proposal is unlikely to be at variance with this Principle.</p>

Principle	Assessment (as per original CPS6915/1 application)	Assessment of proposed amendment	Outcome
<p>Principle (j) – Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence of flooding</p>	<p><i>Recently, part of the South Mine rehabilitation area experienced a number of issues with rehabilitation landform erosion as a result of run-off from neighbouring catchments after significant rainfall events (Coffey Mining Pty Ltd 2015). Although ground contours were in place, and the final landform deep-ripped and mounded on the contours, sheet flow during the significant rainfall events broke through the contours, and left substantial erosion. Following this, a hydrological assessment was conducted (Coffey Mining Pty Ltd 2015), with recommendations made regarding the re-alignment of existing surface water diversion channels, and establishment of new surface water diversion channels. The hydrological assessment is presented in Appendix 2.</i></p> <p><i>As the clearing of vegetation under this proposal is to allow for recommended surface water drainage mitigation measures to be constructed as part of final rehabilitation landforms, and hence mitigate the effects of potential flooding, the clearing will not cause or exacerbate the incidence or intensity of flooding.</i></p> <p><i>The proposed clearing is therefore not at variance to this principle.</i></p>	<p>No change.</p> <p>Iluka proposes to rehabilitate the Proposed Amendment Area at the end of the ERER Project.</p> <p>There are no watercourses or surface water features within the Proposed Amendment Area nor in close proximity and the site is not prone to flooding or water logging.</p> <p>The Project site will be designed to ensure surface water run-off is captured and contained via perimeter bunds and pumped to the process water dam thus the clearing for mineral sands processing will not cause or exacerbate the incidence or intensity of flooding.</p>	<p>The Proposal is unlikely to be at variance with this Principle.</p>

7. CONCLUSION

The increase in the clearing area has been assessed against the ten clearing principles and remains consistent with the DMIRS assessment contained in decision report CPS 6915/1.

Overall, it is considered that the increased clearing area of 5.4 ha will not be at variance with any of the clearing principles and will not result in new or increased impacts.

Given the small area of clearing, its degraded rehabilitated nature, no clearing of threatened flora species, the minimal impact to one location of a priority flora species and no variances to the 10 clearing principles, the increased clearing area will not have a more significant impact than the original clearing permit and does not introduce any new significant adverse impacts.

8. REFERENCES

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Appendix 1: NVCP Amendment Application Form and Fee
