ATTACHMENT 1

SUPPORTING INFORMATION

IRON RIDGE PROJECT

CLEARING PERMIT CPS 8891/2 AMENDMENT SUPPORTING INFORMATION

Tenements: M20/118, G20/28, G20/29, L20/83, L20/84, L20/85

Revision: 0

Date: February 2024

Prepared by
Ecotec (WA) Pty Ltd for:

[redacted]

TABLE OF CONTENTS

TABLES

FIGURES

APPENDICES (Provided as a separate document)

Appendix 1: Flora and Fauna Reports

1a: Flora and Vegetation Assessment – Woodman Environmental Consulting 2009

1b: Local and Regional Significant Flora Assessment - Woodman Environmental Consulting 2012

1c: Iron Ridge Biological Survey 2019 – *ecologia* Environment 2020a

1d: *Micromyrtus placoides* (Priority 3) Impact Assessment - *ecologia* Environment 2020b

1e: *Micromyrtus placoides* Targeted Survey Findings - ecologia Environment 2020d

1f: Status review of Idiosoma clypeatum – Biologic Environmental Survey 2019

1g: Weld Range Idiosoma nigrum Survey – Biologic Environmental Survey 2012

Appendix 2: SRE and Stygofauna Reports

2a: Summary of the Weld Range SRE habitat assessment

2b: Targeted Shield-backed Trapdoor Spider, SRE Invertebrate and Vertebrate Fauna Survey: September 2009 – Bamford Consulting Ecologists 2009.

2c: Iron Ridge Stygofauna Assessment - *ecologia* Environment 2020c

Appendix 3: Surface and Groundwater Reports – Rockwater Pty Ltd

3a: Surface Water Assessment – Starter Pit

3b: Surface Water Assessment – Phase 2 Pit

3c: Bore Completion and Hydrogeological Assessment

3d: Assessment of Final Mine Void

3e: Diversion of Surface Water Flows

1 OVERVIEW

Fenix Resources Ltd commenced development of the Iron Ridge Project in the Mid-West Region of Western Australia in late 2020. Stages 1 and 2 of the project have to date (February 2023) resulted in mining of approximately three million tonnes (Mt) of iron ore (including low grade) since commencement of the project. The third stage of the project is expected to produce an additional two million tonnes of ore to complete the mining project.

Ore is crushed on site using a semi-mobile crushing plant, then trucked to Geraldton for export to overseas customers. Since commencement of the operation in late 2020, 2,852,773 tonnes of ore have been shipped to China from Geraldton.

Stages 1 and 2 have produced approximately 8.8 Mt of waste rock, with some being used for construction of pads and road surfaces, and the remainder deposited into a waste dump adjacent to the pit on M20/118 and G20/29 (under agreement with G20/29 tenement holders Sinosteel Midwest Corporation Ltd (Sinosteel)). Stage 3 will result in an additional 10.7 Mt of waste, which will be deposited in the existing waste dump, which will extend slightly to the south.

The workforce operate on a fly-in, fly-out (FIFO) roster and are accommodated in a purpose-built facility approximately 3 km from the mine site.

Fenix Resources lodged a Mining Proposal and Mine Closure Plan in April 2020 detailing Stage 1 of the Iron Ridge operation. Approval was received on 12 August 2020. A second Mining Proposal and Mine Closure Plan were submitted in April 2021 detailing Stage 2 of the operation, with approval received on 12 August 2021. The Mining Proposal and Mine Closure plan for Stage 3 of the operation is currently under assessment by DEMIRS.

A Native Vegetation Clearing Permit application was submitted in April 2020 and approved on 12 September 2020, allowing for up to 98.6 ha of clearing to be undertaken within the project tenements. An amendment to the permit was submitted in April 2021 for an additional 41.5 ha of clearing to be undertaken for the project and adding G20/29 to the permit. This amendment was approved on 1 July 2021 (CPS8891/2) allowing for up to 140.1 ha of disturbance.

A Works Approval application was lodged in May 2020 seeking approval for Category 5 (crushing and screening), Category 6 (mine dewatering) and Category 85 (sewage treatment and discharge). The Works Approval was granted and issued on 7 October 2020. An application for an Operating Licence was submitted to DWER in 2023 and has been assessed. The Licence fees were paid in January 2024 and receipt of the Operating Licence is imminent.

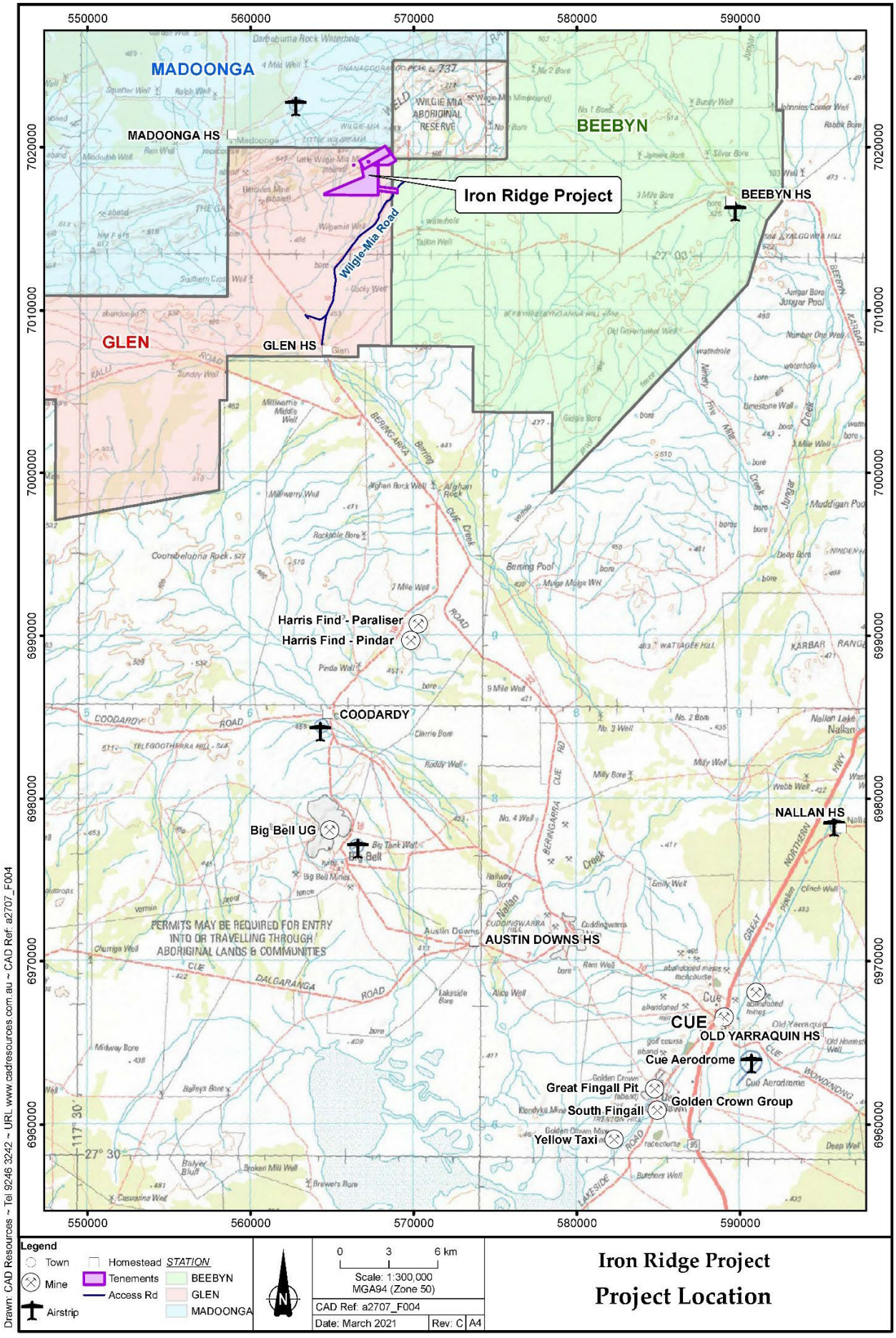


Figure 1.1: Iron Ridge Project regional location.

2 MINE ACTIVITY DETAILS

To develop Stage 3 of the project, additional clearing of 17.7 ha will be undertaken for extension of the open pit (8.6 ha), extension of the waste dump (5.5 ha), roads, stockpiles and abandonment bund (3.6 ha). Table 2.1, from the Stage 3 Mining Proposal, provides details of the current and proposed mine activity types at the Iron Ridge Project.

Figure 2.1 provides the Disturbance Envelope for the project and all disturbance will occur within the defined Disturbance Envelope. Figure 2.2 provides the proposed site layout.

Table 2.1: Current and proposed mine activity and areas of disturbance.

Tenement: M20/118				
Activity Category	**Activity Reference**	**Proposed area (Ha)**	**Current Approved Area (Ha)**	**Total Area (Ha)** (proposed + current approved)
Key Mine Activities				
Waste dump or overburden stockpile (class 1)	Waste dump	0	15.30	15.30
Mining void (depth greater than 5m – below groundwater)	Open pit and surrounds	8.60	28.50	37.10
Key Mine Activity Total Area		**8.60**	**43.80**	**52.40**
Other Mine Activities				
Low-grade ore stockpile (class 2)	Low grade stockpile	*Footprints not required*		
Dam - fresh water	Water storage dam			
Workshop	Magazine			
Laydown or hardstand area	Laydown, parking areas			
Transport or infrastructure corridor	Haul and access roads			
Topsoil stockpile	Topsoil stockpiles			
Diversion channel or drain	Diversion drain			
Land that is cleared of vegetation (other cleared land)	Abandonment bund			
Land that is cleared of vegetation (other cleared land)	Miscellaneous historic disturbance			
Other Mine Activity Total Area		**0.85**	**10.00**	**10.85**
Total Tenement Activity Area		**9.45**	**53.80**	**63.25**

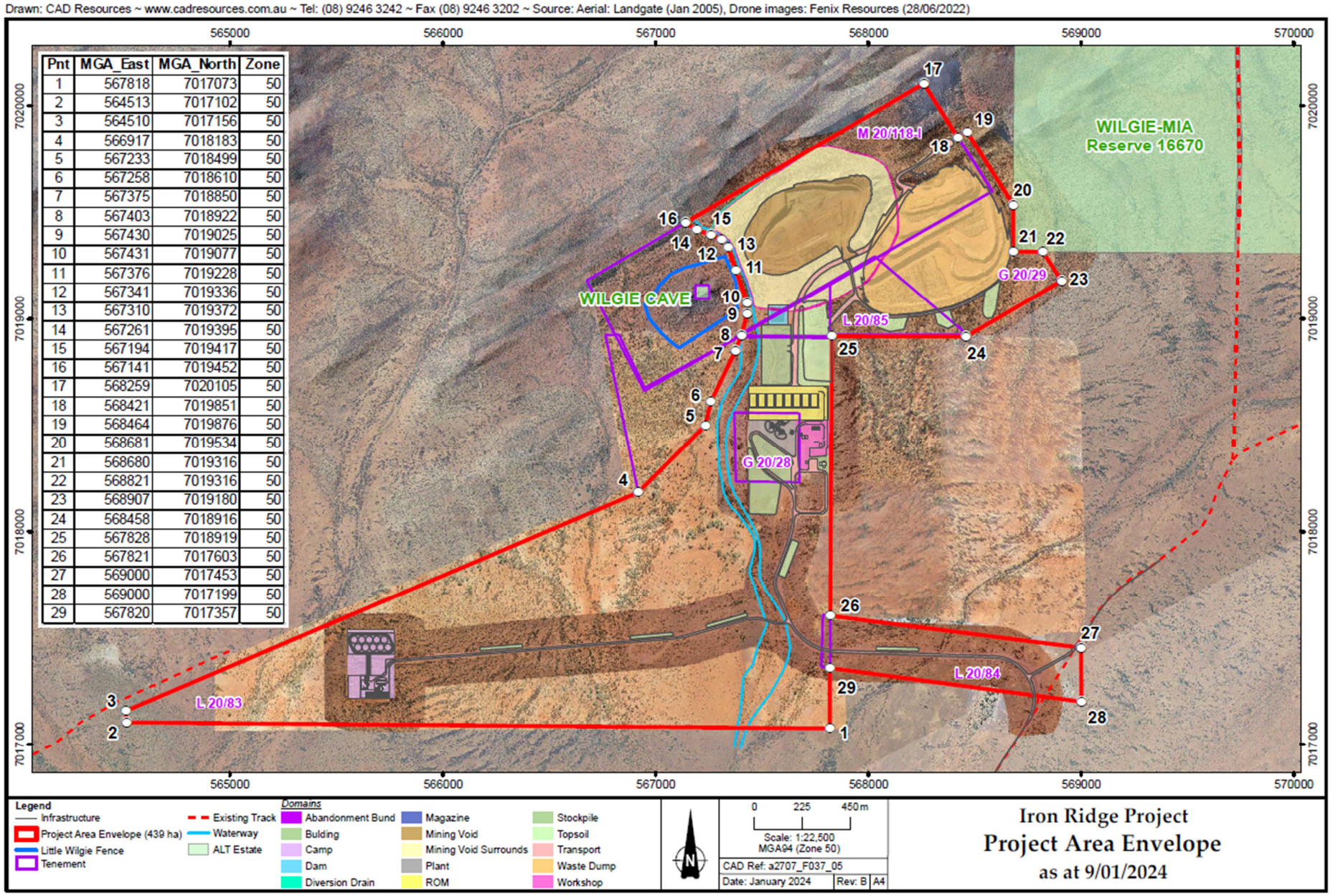
Tenement: G20/28				
Activity Category	**Activity Reference**	**Proposed area (Ha)**	**Current Approved Area (Ha)**	**Total Area (Ha)** (proposed + current approved)
Key Mine Activities				
Plant site	Crushing and screening	0	4.10	4.10
Run of mine pad	ROM	0	0.80	0.80
	Key Mine Activity Total Area	**0**	**4.90**	**4.90**
Other Mine Activities				
Low-grade ore stockpile (class 2)	Ore and low grade stockpiles	*Footprints not required*		
Workshop	Plant workshop			
Transport or infrastructure corridor	Haul and access roads, pipe lines			
Topsoil stockpile	Topsoil stockpiles			
	Other Mine Activity Total Area	**0**	**5.30**	**5.30**
	Total Tenement Activity Area	**0**	**10.20**	**10.20**

Tenement: G20/29				
Activity Category	**Activity Reference**	**Proposed area (Ha)**	**Current Approved Area (Ha)**	**Total Area (Ha)** (proposed + current approved)
Key Mine Activities				
Waste dump or overburden stockpile (class 1)	Waste dump	5.50	21.70	27.20
	Key Mine Activity Total Area	**5.50**	**21.70**	**27.20**
Other Mine Activities				
Transport or infrastructure corridor	Haul and access roads, pipe lines	*Footprints not required*		
Land that is cleared of vegetation (other cleared land)	Abandonment bund			
Topsoil stockpile	Topsoil stockpiles			
	Other Mine Activity Total Area	**0.45**	**4.90**	**5.35**
	Total Tenement Activity Area	**5.95**	**26.60**	**32.55**

Tenement: L20/83				
Activity Category	**Activity Reference**	**Proposed area (Ha)**	**Current Approved Area (Ha)**	**Total Area (Ha)** (proposed + current approved)
Key Mine Activities				
Run of mine pad	ROM	0	5.30	5.30
	Key Mine Activity Total Area	**0**	**5.30**	**5.30**
Other Mine Activities				
Building (other than workshop) or camp site	Administration, crib room, ablutions, stores	*Footprints not required*		
Building (other than workshop) or camp site	Camp and spray field			
Fuel storage facility	Fuel storage - mine			
Fuel storage facility	Fuel storage - camp			
Low-grade ore stockpile (class 2)	Ore and low grade stockpiles			
Laydown or hardstand area	Laydown, parking areas			
Transport or infrastructure corridor	Haul and access roads, pipe lines			
Workshop	Heavy vehicle workshops			
Topsoil stockpile	Topsoil stockpiles			
	Other Mine Activity Total Area	**0**	**37.20**	**37.20**
	Total Tenement Activity Area	**0**	**42.50**	**42.50**

Tenement: L20/84				
Activity Category	**Activity Reference**	**Proposed area (Ha)**	**Current Approved Area (Ha)**	**Total Area (Ha)** (proposed + current approved)
Key Mine Activities				
Nil		0	0	0
	Key Mine Activity Total Area	**0**	**0**	**0**
Other Mine Activities				
Transport or infrastructure corridor	Haul and access roads	*Footprints not required*		

Topsoil stockpile	Topsoil stockpiles			
Other Mine Activity Total Area		**0**	**3.5**	**3.5**
Total Tenement Activity Area		**0**	**3.5**	**3.5**
Tenement: L20/85				
Activity Category	**Activity Reference**	**Proposed area (Ha)**	**Current Approved Area (Ha)**	**Total Area (Ha)** (proposed + current approved)
Key Mine Activities				
Nil		0	0	0
Key Mine Activity Total Area		**0**	**0**	**0**
Other Mine Activities				
Low-grade ore stockpile (class 2)	Ore and low grade stockpiles	*Footprints not required*		
Transport or infrastructure corridor	Haul and access roads			
Topsoil stockpile	Topsoil stockpiles			
Dam - fresh water	Water storage dam (part of)			
Land that is cleared of vegetation (other cleared land)	Abandonment bund			
Miscellaneous Mine Activity Total Area		**2.40**	**3.40**	**5.80**
Total Tenement Activity Area		**2.40**	**3.40**	**5.80**
Total Mine Activity Area		**17.80**	**140.00**	**157.80**



Pnt	MGA_East	MGA_North	Zone
1	567818	7017073	50
2	564513	7017102	50
3	564510	7017156	50
4	566917	7018183	50
5	567233	7018499	50
6	567258	7018610	50
7	567375	7018850	50
8	567403	7018922	50
9	567430	7019025	50
10	567431	7019077	50
11	567376	7019228	50
12	567341	7019336	50
13	567310	7019372	50
14	567261	7019395	50
15	567194	7019417	50
16	567141	7019452	50
17	568259	7020105	50
18	568421	7019851	50
19	568464	7019876	50
20	568681	7019534	50
21	568680	7019316	50
22	568821	7019316	50
23	568907	7019180	50
24	568458	7018916	50
25	567828	7018919	50
26	567821	7017603	50
27	569000	7017453	50
28	569000	7017199	50
29	567820	7017357	50

Figure 2.1: Iron Ridge Project Disturbance Envelope.

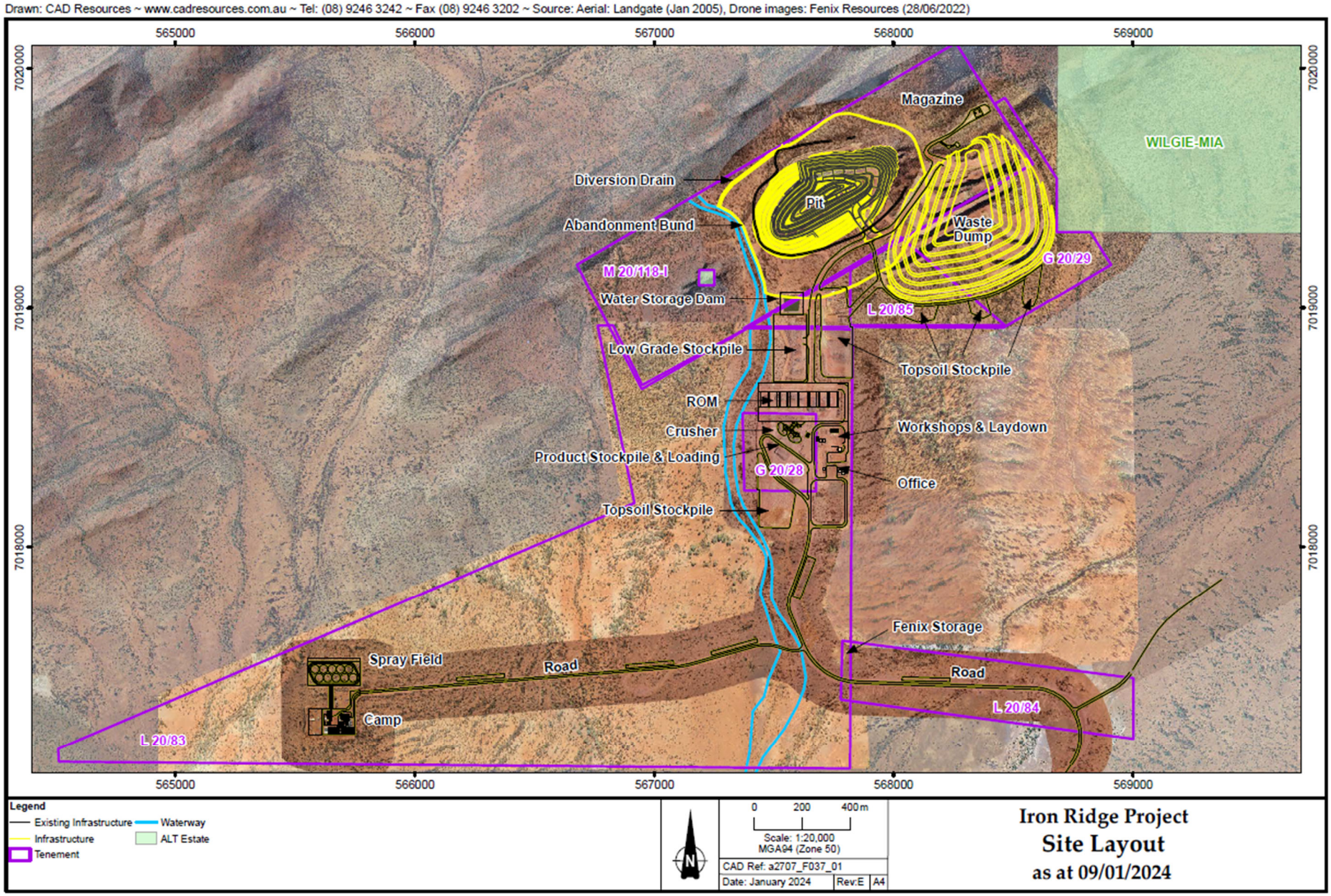


Figure 2.2: Proposed site layout.

3 BASELINE ENVIRONMENTAL DATA

3.1 Summary of changes made for this Clearing Permit amendment

The proposed areas of disturbance to be added to the Clearing Permit were included in the original project survey area and provided previously for the initial Clearing Permit application. As such, the information in this section is largely unchanged from the previous application. In summary, the key points relating to this revised proposal are:

- The proposed expansion of the pit will not directly impact any flora of conservation significance additional to that described in the previous version of the Clearing Permit (refer to Section 3.5).
- The proposed expansion of the pit will have no additional impact on habitat suitable for fauna of conservation significance (refer to Section 3.8).
- The proposed expansion of the pit and abandonment bund will result in 8.85 ha of additional disturbance to the Weld Range vegetation complexes (banded ironstone formation) Priority 1 Priority Ecological Community (PEC) (refer to Section 3.6).
- The proposed expansion of the pit will require installation of a 0.25 ha channel outside the northern edge of the abandonment bund to manage surface water drainage in the area (refer to Section 3.11).

3.2 IBRA 7 Biogeographic subregions

The Interim Biogeographic Regionalisation for Australia (IBRA) classifies the Australian continent into regions or bioregions on the basis of similar geology, landform, vegetation, fauna and climate characteristics. The project area is situated within the Murchison Region according to IBRA 7, which is further divided into two subregions: Eastern Murchison and Western Murchison (DAWE 2019). The study area is situated within the Western Murchison subregion (MUR2).

The West Murchison subregion is in the northern end of the Yilgarn Craton, which experiences an arid climate with bimodal rainfall that usually falls in the winter months. The Western Murchison subregion is characterised by Mulga low woodlands on outcrop and fine textured Quaternary alluvial and eluvial surfaces mantling granitic and greenstone strata. Quaternary plains contain hummock grasslands, saltbush shrublands on calcareous soils and *Halosarcia* low shrublands on saline alluvia (DAWE 2019).

3.3 Landscape

The Iron Ridge Project is located within the Murchison Bioregion of the Interim Biogeographic Regionalisation of Australia (IBRA) and is situated in the Western Murchison subregion (MUR2), close to the boundary of the Eastern Murchison subregion (MUR1).

The MUR2 subregion is described by Desmond et. al. (in DAWE 2019) as follows:

> "*Mulga low woodlands, often rich in ephemerals (usually with bunch grasses), on outcrop and fine textured Quaternary alluvial and eluvial surfaces (extensive hardpan wash plains that dominate and characterise the subregion) mantling granitic and greenstone strata of the northern part of the Yilgarn Craton. Surfaces associated with the occluded drainage occur throughout with hummock grasslands on Quaternary sandplains, saltbush shrublands on calcareous soils and Halosarcia low shrublands on saline alluvia. Contains the headwaters of the Murchison and Wooramel Rivers, which drain the subregion westwards to the coast. Arid climate with bimodal rainfall that usually falls in winter. The subregional area is 7,847,996 ha.*" (DAWE 2019).

Laterite or silcrete mesas are usually found at the top of the landscape in areas of granitic basement. These mesas have lateritic breakaways, kaolinised footslopes (often saline) and are surrounded by gently sloping plains. There are also some low hills, domes and tor fields of granite, gneiss and quartz found in upper parts of the landscape. The bulk of the terrain consists of gently undulating wash plains and sandplains sitting below the mesas and hills.

Although wash plains are most common in the north-west, they occur throughout the province with the exception of its eastern margin. These wash plains consist of very gently inclined alluvial surfaces that carry sheet flows. Typically, an almost continuous cemented layer of red-brown hardpan has formed in these deposits. There are often small sandy banks and groves across the wash plains and gravelly mantles are sometimes present. Narrow

saline drainage tracts may also be found (Tille 2006).

Soils on the plains are typically red loamy earths and red-brown hardpan shallow loams. Red sandy soils are found along the significant drainage channels. Shallow loams and sands and stony soils are found on the hills and mesas with sandy soils more common on granitic hills. Salt lake soils are found on the valley floors (Tille 2006).

The local area is generally undulating with ranges of low hills, the Weld Range being one of these. Extensive sandplains occur in the east. The area is intersected by ephemeral drainage lines with shallow soils and exposed rock on the hills. Within the project area there are two north-east to south-west banded iron formations (BIFs). The central jasperlite ridge is divided by major north-south drainage.

3.4 Biological surveys

Flora and fauna surveys have been completed in and around the project area and the wider Weld Range. The project area and surrounds have been quite extensively covered by prior biological surveys. The surveys conducted by *ecologia* in 2019 focused on the areas that did not have sufficient coverage.

A summary of the surveys relevant to the project are presented in Table 3.1. More details are provided in the following sections.

Table 3.1: Flora and fauna surveys in and around Weld Range.

Survey type and location.	Year	Consultants
Flora and vegetation survey - Weld Range Iron Ore; Atlas Iron	2008	Woodman Environmental
Flora and Vegetation of the banded iron formations of the Yilgarn Craton: The Weld Range	2008	Department of Conservation (DEC)
Targeted Shield-backed trapdoor spider, SRE Invertebrate and vertebrate fauna survey	2009	Bamford Consulting Ecologists
Weld Range Level 1 Targeted Fauna Survey; Atlas Iron Ltd	2009	Biologic
Weld Range Vertebrate Fauna Assessment. Unpublished Report for Sinosteel-Midwest Management	2009	*ecologia*
SRE Invertebrate habitat survey; Atlas Weld Range Project	2011	Biologic
Weld Range DSO Project, Local and Regional Significant Flora Assessment 2012; Atlas Iron Ltd	2012	Woodman Environmental
Weld Range DSO Project, Flora and Vegetation Assessment; Atlas Iron Ltd	2012	Woodman Environmental
Weld Range *Idiosoma nigrum* Survey 2012; Atlas Iron Ltd	2012	Biologic
Idiosoma nigrum Status Review	2019	Biologic
Iron Ridge Flora and Fauna Reconnaissance Survey	2019	*ecologia*
Iron Ridge Biological Survey 2019	2019	*ecologia*
Micromyrtus placoides (Priority 3) Impact Assessment	2020	*ecologia*
Micromyrtus placoides Targeted Survey	2020	*ecologia*

The BIF ranges of the Mid West and Goldfields regions are generally considered to have significant biodiversity value because of their unique geology, soils and relative isolation. The values of the ranges are related to the presence of endemic plant species, threatened and restricted plant species, highly restricted and distinct plant communities and ecological communities. The ranges also exhibit very distinct features in their regional landscape and in many cases possess outstanding landscape values. They also have fauna conservation values although these are less well documented than for flora. There are, however, differences between the various BIF ranges in terms of their biodiversity conservation and mineral prospectively/resource values.

The Midwest BIF ranges are considered to be under represented in the State's reserve system (Department of Environment and Conservation [DEC] 2007) however, in the report *Banded Ironstone Formation Ranges of the Midwest and Goldfields - Interim Status Report - Biodiversity Values and Conservation Requirements* by DEC (now DBCA), the Weld Range was described as being a "lower biodiversity value site, although still providing refugial habitats with localised species and vegetation communities" (DEC 2007).

The Iron Ridge Project partly coincides with the Priority 1 Priority Ecological Community (PEC) "Weld Range vegetation complexes (banded ironstone formation)" and the 500 m administrative buffer that surrounds it. Rather than being defined by a specific plant community, the extent of the Weld Range PEC has been determined on the basis of its extent over the banded iron formation of the Weld Range (*ecologia* 2020a).

A survey of the flora and floristic communities of the Weld Range was undertaken by DEC in 2005 (Markey and Dillon 2008). A total of 239 taxa (species, subspecies and varieties) and five hybrids of vascular plants were collected and identified from within the survey area. Of these, 229 taxa were native and 10 species were introduced. Eight priority species were located in this survey, six of these being new records for the Weld Range.

Eight floristic community types (six types, two of these subdivided into two subtypes each) were identified and described for the Weld Range. There did not appear to be any restricted communities within the landform, but some of these communities may be geographically restricted to the Weld Range (Markey and Dillon 2008).

Table 3.2 lists the floristic communities identified during the DEC survey of Weld Range (Markey and Dillon 2008).

Table 3.2: Floristic communities of the Weld Range, as identified by DEC in 2005.

Reference	Description
Community 1a:	Dominated by *Acacia aneura*, *Acacia ramulosa* and/or *Acacia* sp. Weld Range (A. Markey & S. Dillon 2994) over sparse shrub cover of *Eremophila* spp., mainly on mid-upper slopes.
Community 1b:	Open shrubland of *Acacia aneura*, *Acacia* sp. Weld Range (A. Markey & S. Dillon 2994) and *Grevillea berryana* over shrub cover of *Eremophila* spp. on gentle-moderates slopes.
Community 2:	Open Shrubland of *Acacia* cf. *aneura* var. *microcarpa* and/or *Acacia* cf. *aneura* var. *aneura*, over *Thryptomene decussata*, *Philotheca brucei* subsp*. brucei* and *Eremophila* spp. on BIF on moderate-steep slopes.
Community 3:	Depauperate Shrubland dominated by *Acacia aneura* on scree slopes.
Community 4:	Open Shrubland of *Acacia aneura* with *Acacia pruinocarpa* over shrublands of *Philotheca brucei* var. *brucei* and *Eremophila* spp. on steep rocky hillslopes.
Community 5a:	Open Shrubland of *Acacia aneura* and *Acacia ramulosa* with emergent *Acacia pruinosa*, mainly on lower slopes and outwash areas.
Community 5b:	Open Shrubland of *Acacia aneura* or *Acacia effusifolia* over *Senna* spp. and *Tribulus suberosus* on lower slopes.
Community 6:	Sparse Shrubland of Acacia sp. Weld Range (A. Markey & S. Dillon 2994), *Acacia aneura* and *Acacia speckii* over Shrubland of *Eremophila macmilliana*, *Eremophila mackinleyi* subsp. *spathulate* and *Senna* spp. on dolerite

Knowledge of the faunal biodiversity significance of the BIF environments is incomplete, however current knowledge indicates that these isolated areas provide important refuges for fauna. Nineteen vertebrate fauna and one invertebrate species of conservation significance were identified from Threatened and Priority Fauna database searches within 100 km of the project area, predominately recorded within the Weld Range.

3.5 Native flora

Recent database searches indicate that a total of 281 flora taxa have been recorded within a 50 km area around the project site, including 30 conservation significant species. No Threatened flora species have been recorded in the area. Figure 3.1 provides the recorded locations of Priority listed flora within a 50 km radius of the project.

Woodman Environmental Consulting Pty Ltd (Woodman) conducted a detailed flora and vegetation survey of M20/118 in 2008, as well as a targeted conservation significant flora survey of a number of proposed exploration drill lines in the area in 2009 for Atlas Iron Ltd (Atlas). In 2011 Atlas commissioned Woodman to accurately map the distribution of all conservation significant flora taxa in and around M20/118, as well as to conduct a regional search for further populations of these taxa. The 2012 Woodman report *Weld Range DSO Project – Local and Regional Significant Flora Assessment* (Woodman 2012), compiles the results of each of these surveys. The 2009 Woodman survey recorded 135 vascular flora taxa from 38 families and 70 genera within M20/118. This included two introduced species and seven Priority listed flora species (refer to Table 3.3). No threatened species were recorded (Woodman 2009). The Woodman reports are included in Appendix 1.

Ecologia Environment Pty Ltd (*ecologia*) was commissioned by Fenix to carry out a Reconnaissance level survey in July 2019 and a detailed Level 1 flora and vegetation survey in September 2019. These surveys focussed on the area to the east and south of M20/118, which will be impacted by the proposed development and had not been adequately covered by previous biological surveys. The surveys undertaken by Woodman were reviewed and those results incorporated where appropriate in the survey report. The *ecologia* surveys recorded 171 vascular plant taxa from 49 families and 134 genera within the project area. Eight State listed Priority flora species were recorded during the survey. No Threatened flora species were recorded (*ecologia* 2020a).

Table 3.3 provides a summary of the conservation significant flora recorded during survey work, as well as those species considered to be possible inhabitants of the immediate project area. Species that were considered as unlikely to occur following the survey are not included in this summary table. Full discussion is included in the *ecologia* report (*ecologia* 2020a), provided in Appendix 1.

The combined distribution of Priority species recorded in the *ecologia* (2020a) and Woodman (2012) surveys in relation to the proposed development infrastructure is shown on Figure 3.2.

Table 3.3: Conservation significant flora recorded and potentially occurring in the project area.

Species	Conservation Status	Likelihood of occurrence
Acacia dilloniorum (Recorded as Acacia sp. Wilgie Mia in the Woodman surveys)	P1	Recorded 2019 and 2012
Stenanthemum patens	P1	Recorded 2019 and 2012
Goodenia grandiflora	P1	Possible
Hemigenia virescens	P3	Recorded 2019
Micromyrtus placoides	P3	Recorded 2019 and 2012
Prostanthera petrophila	P3	Recorded 2019 and 2012
Acacia speckii	P4	Recorded 2019 and 2012
Dodonaea amplisemina	P4	Recorded 2019 and 2012
Goodenia berringbinensis	P4	Possible
Grevillea inconspicua	P4	Recorded 2019 and 2012

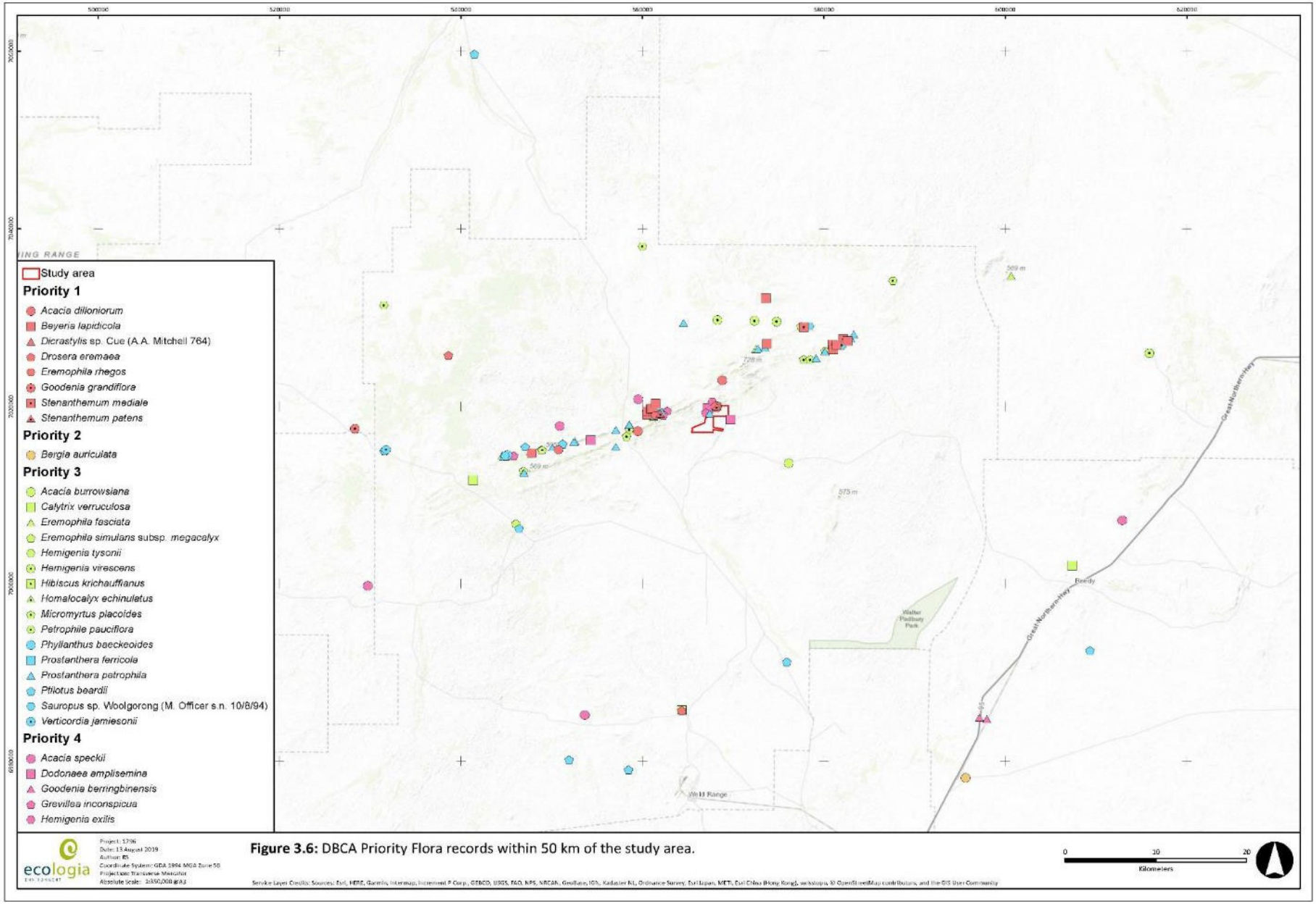


Figure 3.1: Priority flora records within 50 km of the project area.

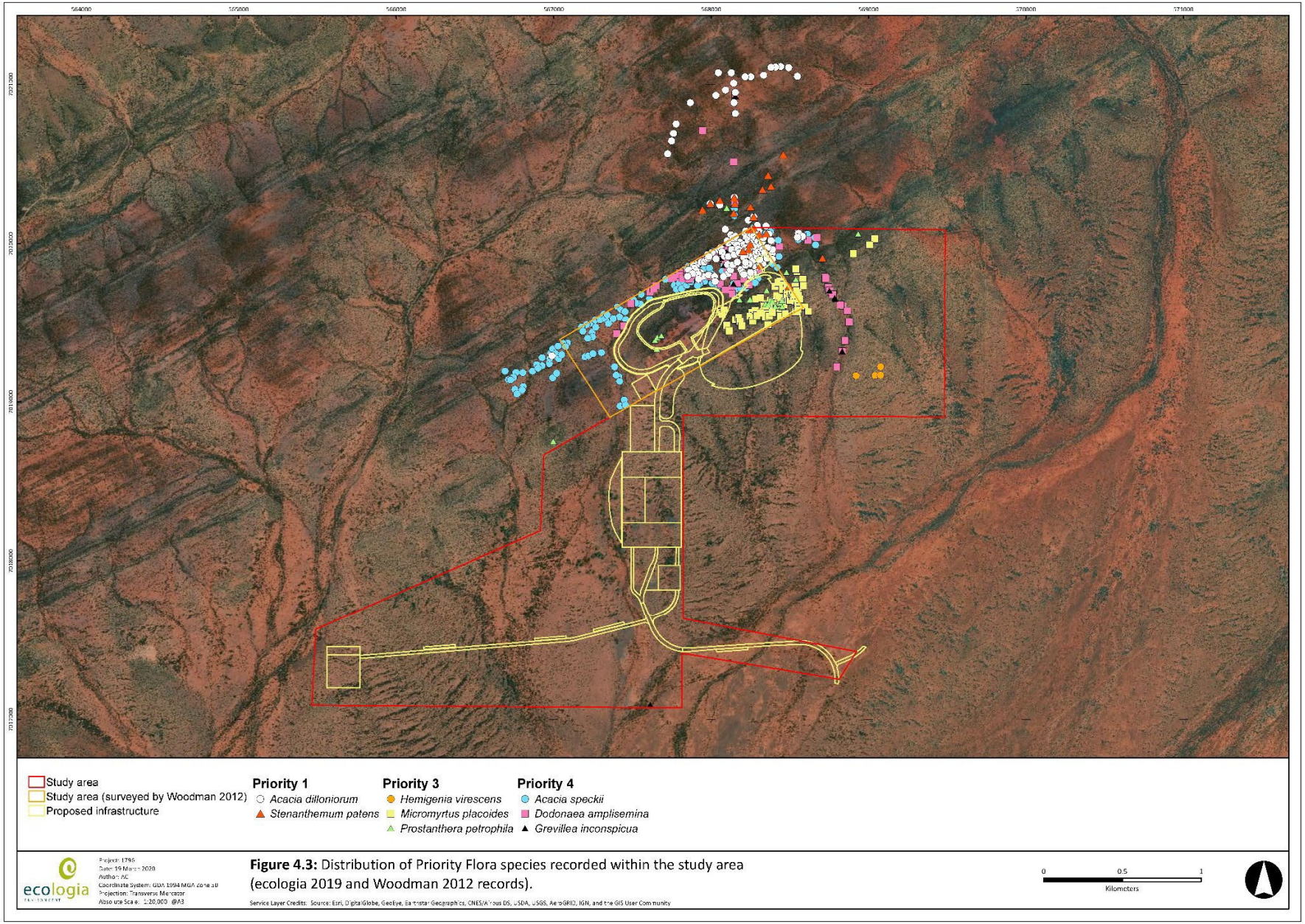


Figure 4.3: Distribution of Priority Flora species recorded within the study area (ecologia 2019 and Woodman 2012 records).

Figure 3.2: Distribution of Priority Flora species recorded within and adjacent to the project area.

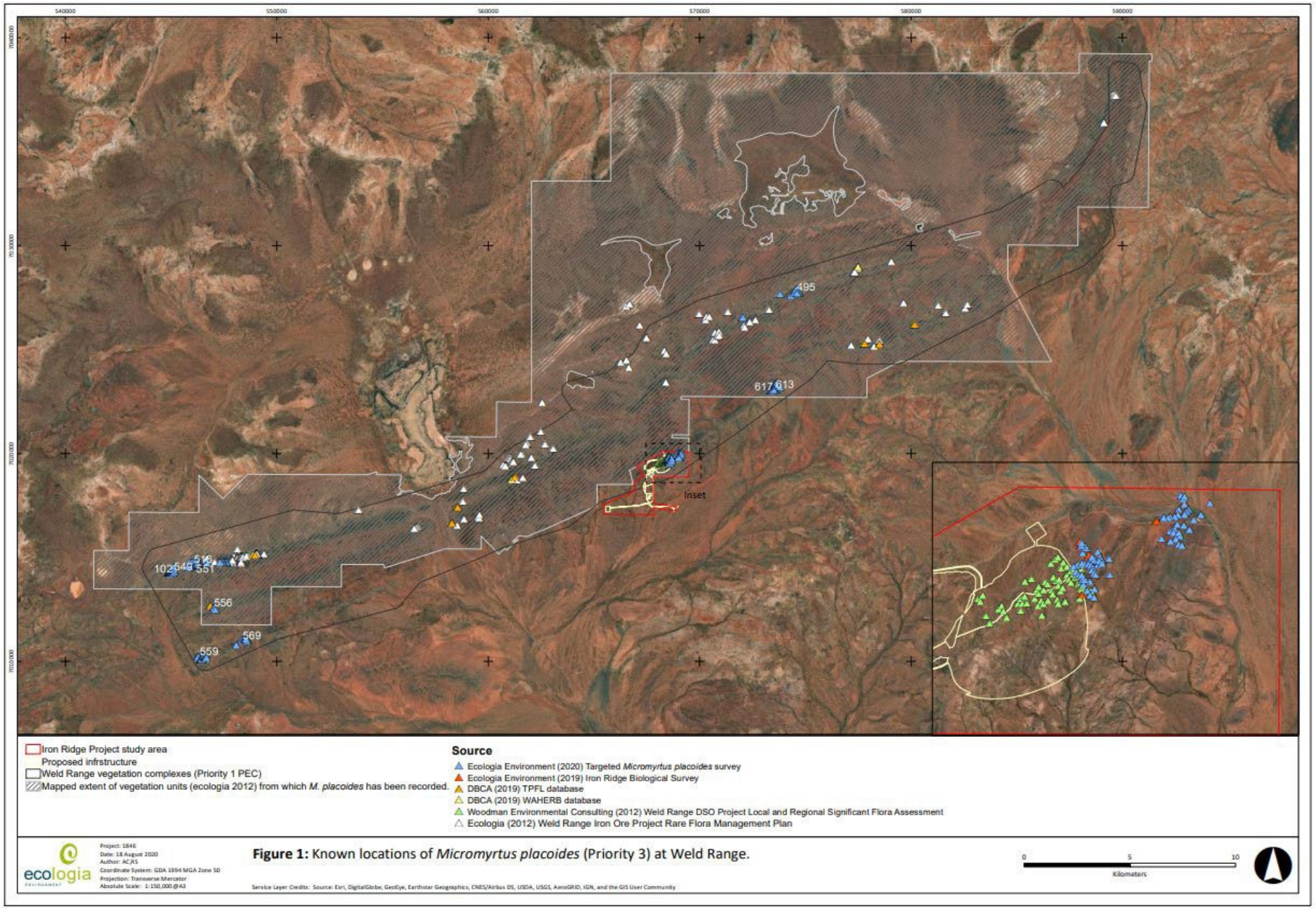


Figure 3.3: Known locations of *Micromyrtus placoides* (P3) at Weld Range (updated August 2020).

Multiple surveys for *Micromyrtus placoides* and other conservation significant plant species have been undertaken at Weld Range since 2006 by *ecologia* and Woodman. Most recent was a targeted *Micromyrtus placoides* survey undertaken by *ecologia* in August 2020 (*ecologia* 2020d).

Micromyrtus placoides occurs within the Murchison and Yalgoo IBRA bioregions (Eastern Murchison, Western Murchison and Tallering subregions). It has a relatively restricted distribution from near Cue (Weld Range), southwest to Tallering Peak. It occurs extensively across Weld Range (Figure 3.3) in a variety of habitats including undulating plains, dry creek beds, hill slopes and ridges, on red-orange or orange-yellow sandy clay, coarse gravel, BIF, laterite, quartz and basalt. It has been recorded from eight of the 11 vegetation units described for Weld Range and surrounding areas by *ecologia* in 2012. More than 98% of the known records at Weld Range occur within the boundary of the Weld Range vegetation complexes (banded ironstone formation) Priority 1 PEC. At Weld Range, *Micromyrtus placoides* is therefore largely confined to the range itself, with an expected extent of suitable habitat of 21,180 ha, based on the 2012 *ecologia* vegetation unit mapping.

Following the targeted survey in August 2020 (ecologia 2020d), the Weld Range *M. placoides* population is now estimated at 33,724 individuals (an increase of more than 20,000 individuals). Figure 3.3 provides an updated map showing the known locations of *M. placoides* following the targeted survey in August 2020. More than 25,000 individuals have also been recorded at Tallering Peak (*ecologia* 2020b).

3.5.1 Vegetation

The 2009 Woodman survey recorded five floristic community types ("FCT" in the report) within M20/118, which generally corresponded with the floristic communities described by Markey and Dillon (2008). The floristic communities described in the Woodman report are listed in Table 3.4.

The Woodman survey report concluded that, while all of the floristic communities described are likely to be restricted to the Weld Range, none appear to be restricted to the project area (being M20/118), with the majority having been recorded over the length of the range in the DEC survey (Woodman 2009; Markey and Dillon 2008).

Table 3.4: Floristic communities identified in M20/118 by Woodman (2009).

Reference	Description
FCT 5:	Open tall shrubland of *Acacia aneura* with emergent low trees of *Acacia pruinocarpa* over open mid shrubland of *Thryptomene decussata*, *Eremophila latrobei* subsp. *latrobei* over sparse low shrubland of *Sida* sp. *excedentifolia* (J.L. Egan 1925) over open low forbland of *Goodenia tenuiloba*, *Goodenia macroplectra* and *Monachather paradoxus*.
FCT 6a:	Open tall shrubland of *Acacia aneura* and *Acacia ramulosa* var. *linophylla* over sparse mid shrubland of *Senna glaucifolia* and *Senna artemisioides* subsp. *helmsii* over sparse low shrubland of *Ptilotus obovatus* over open low forbland of *Goodenia tenuiloba* and *Monachather paradoxus.*
FCT 6b:	Open tall shrubland of *Acacia aneura* and *Acacia ramulosa* var. *linophylla* over open mid shrubland of mixed *Eremophila* spp. over open to sparse low shrubland of *Ptilotus obovatus* over open low forbland of *Cheilanthes sieberi*, *Goodenia tenuiloba* and *Monachather paradoxus.*
FCT 7:	Open tall shrubland of *Acacia aneura* with emergent low trees of *Acacia pruinocarpa*, over low shrubland of *Ptilotus obovatus* and *Eremophila* spp. over open low forbland of *Goodenia tenuiloba*, *Lepidium oxytrichum* and *Enneapogon caerulescens.*
FCT 8:	Open tall shrubland of *Acacia* sp. Weld Range (A. Markey & S. Dillon 2994) and *Acacia speckii* over open mid shrubland of *Eremophila mackinlayi* subsp. *spathulata* and mixed *Senna* spp. over open low shrubland of *Ptilotus obovatus* and *Heliotropium ovalifolium* over open low forbland of *Goodenia tenuiloba*, *Velleia glabrata* and *Ptilotus helipteroides.*

Ecologia conducted a Similarity Profile Analysis on floristic data collected from 24 sampling sites surveyed within the study area in September 2019 and identified ten significantly different vegetation types. These vegetation types tended to correlate strongly with soil types, topographic features and landforms present within the study area.

Vegetation condition at all sampling sites was assessed as 'Very Good' or 'Excellent' according to the EPA Vegetation Condition Scale. Excluding cleared vehicle tracks and graded grid lines, vegetation across the entire study area showed either no obvious evidence of disturbance or only minor weed invasion or grazing by cattle and goats (*ecologia* 2020a).

Table 3.5 provides a summary of the project area vegetation types and condition as recorded by *ecologia* (2020a). Figure 3.4 shows the distribution of vegetation types within the project area. Further detail can be found in the *ecologia* report, included in Appendix 1.

Table 3.5: Vegetation of the project area.

Code	Broad floristic formation (NVIS III)	Vegetation description (NVIS V)	Landform	Soil type and surface geology	Vegetation condition
SH01	*Acacia* sparse shrubland	*Acacia ramulosa* var. *ramulosa*, *Acacia tetragonophylla* tall sparse shrubland; *Ptilotus obovatus*, *Scaevola spinescens*, *Senna artemisioides* subsp. ×*artemisioides* low sparse shrubland.	Plains	Red-brown clay loam; calcrete, BIF pebbles	Excellent
SH02	*Acacia* sparse shrubland	*Acacia* sp. Weld Range (A. Markey & S. Dillon 2994), *Acacia speckii* (P4), *Acacia pteraneura* tall sparse shrubland; *Eremophila glutinosa*, *Eremophila mackinlayi* subsp. *spathulata*, *Senna artemisioides* subsp. ×*sturtii* low sparse shrubland.	Gentle to moderate dolerite slopes	Red-brown clay loam; dolerite, BIF	Excellent
SH03	*Acacia* open shrubland	*Acacia* sp. Weld Range (A. Markey & S. Dillon 2994), *Acacia incurvaneura*, *Acacia ramulosa* var. *linophylla* tall open shrubland; *Eremophila forrestii* subsp. *forrestii*, *Harnieria kempeana* subsp. *muelleri*, *Ptilotus obovatus* low sparse shrubland.	Minor creeks	Red-brown clay loam; BIF pebbles	Excellent
SH04	*Acacia* sparse shrubland	*Acacia* sp. Weld Range (A. Markey & S. Dillon 2994), Acacia ramulosa var. linophylla tall sparse shrubland; *Eremophila mackinlayi* subsp. *spathulata*, *Ptilotus obovatus*, *Senna artemisioides* subsp. *helmsii* low sparse shrubland.	Minor creeks	Red-brown clay loam; dolerite, BIF pebbles	Very Good to Excellent
SH05	*Acacia* sparse shrubland	*Acacia rhodophloia*, *Acacia incurvaneura, Thryptomene decussata* tall sparse shrubland; *Ptilotus obovatus*, *Dodonaea pachyneura*, *Eremophila latrobei* subsp. *latrobei* low sparse shrubland.	Steep banded ironstone slopes and crests	Red-brown clay loam; BIF	Excellent
SH06	*Acacia* sparse shrubland	*Acacia incurvaneura*, *Acacia fuscaneura*, *Acacia incurvaneura* × *mulganeura* tall sparse shrubland; *Eremophila georgei*, *Eremophila forrestii* subsp. *forrestii*, *Psydrax latifolia* low sparse shrubland.	Plains	Red-brown clay loam; BIF pebbles	Excellent

Code	Broad floristic formation (NVIS III)	Vegetation description (NVIS V)	Landform	Soil type and surface geology	Vegetation condition
SH07	*Acacia* sparse shrubland	*Acacia incurvaneura*, *Acacia mulganeura*, *Acacia ramulosa* var. *linophylla* tall sparse shrubland; *Eremophila glutinosa*, *Eremophila latrobei* subsp. *latrobei*, *Micromyrtus placoides* (P3) low sparse shrubland.	Gentle to moderate banded ironstone slopes	Red-brown clay loam; BIF pebbles	Excellent
SH08	*Acacia* sparse shrubland	*Acacia ramulosa var. linophylla, Acacia incurvaneura*, *Acacia incurvaneura* × *mulganeura* tall sparse shrubland; *Eremophila forrestii* subsp. *forrestii*, *Eremophila jucunda* subsp. *jucunda*, *Ptilotus schwartzii* low sparse shrubland.	Plains	Red-brown clay loam; BIF pebbles	Excellent
W01	*Acacia* open woodland	*Acacia pruinocarpa* low open woodland; *Acacia pteraneura*, *Acacia ramulosa* var. *linophylla* tall open shrubland; *Eremophila forrestii* subsp. *forrestii*, *Harnieria kempeana* subsp. *muelleri, Ptilotus obovatus* low sparse shrubland.	Drainage lines, floodplains	Red-brown clay loam; ironstone	Excellent
W02	*Acacia* open woodland	*Acacia pruinocarpa* low open woodland; *Acacia incurvaneura*, *Acacia fuscaneura*, *Acacia ramulosa* var. *linophylla* tall open shrubland; *Eremophila forrestii* subsp. *forrestii*, *Eremophila georgei*, *Ptilotus obovatus* low sparse shrubland.	Drainage lines, floodplains	Red-brown clay loam; BIF pebbles	Very Good to Excellent

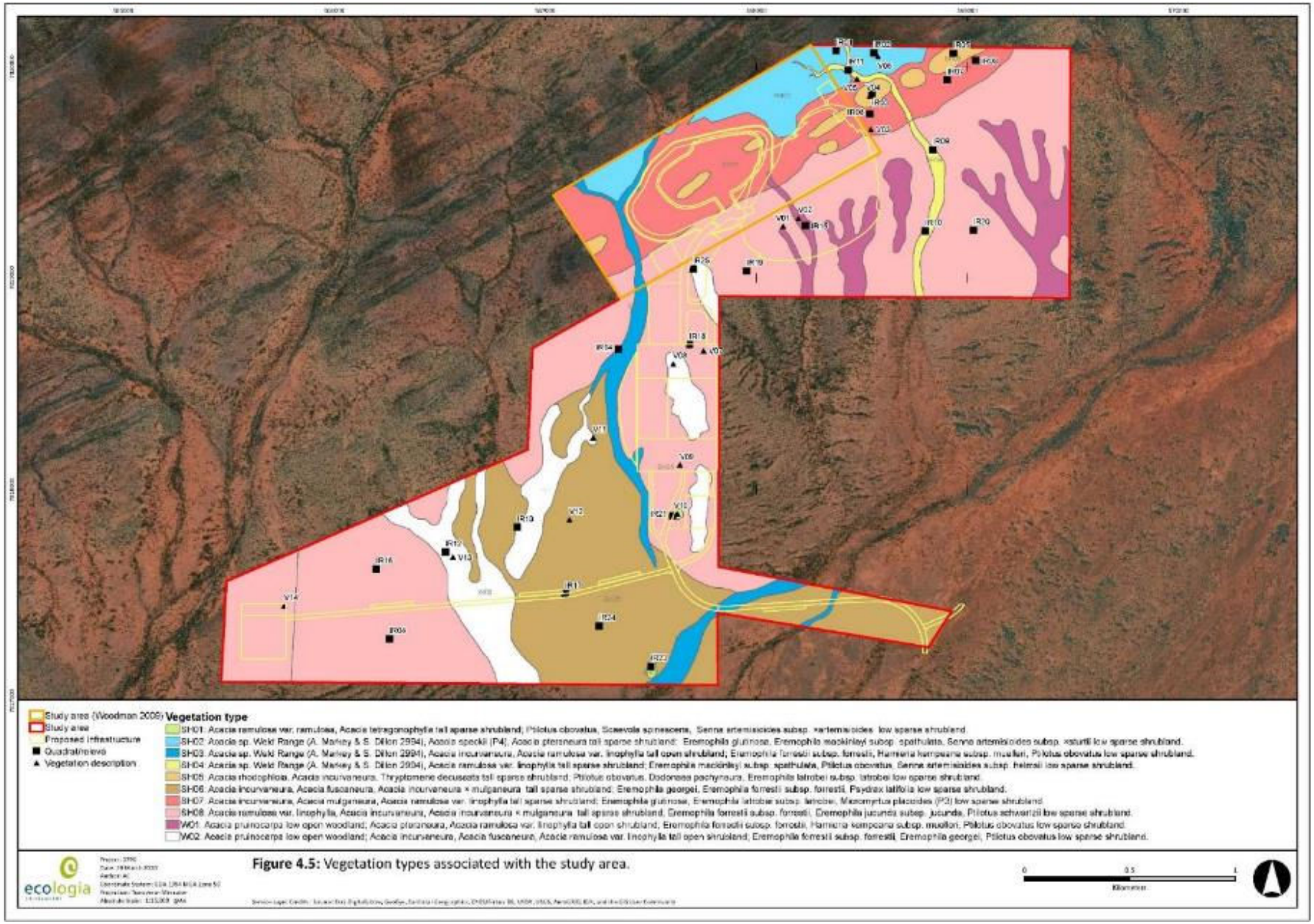


Figure 3.4: Vegetation types associated with the project area.

3.6 Significant vegetation and ecological systems

No State (DBCA) or Commonwealth (EPBC Act) listed Threatened Ecological Communities (TECs) occur within the project area. There are seven Priority Ecological Communities (PECs) recorded within 50 km of the project.

The project area partly coincides with the Priority 1 PEC Weld Range Vegetation Complexes (banded ironstone formation) (DBCA 2019). Figure 6.8 shows the PEC boundary and vegetation in relation to the proposed project layout. The PEC boundary defined by DBCA includes a 500 m "administrative buffer", shown on **Error! Reference source not found.**. Approximately 76 ha of disturbance proposed for the project will occur within the PEC, inclusive of the buffer zone. This equates to less than 0.3% of the buffered Weld Range PEC. This includes the proposed Stage 3 disturbance of 8.6 ha or 0.04 % of the buffered Weld Range PEC.

Vegetation types SH02, SH05 and SH07 correspond to PEC vegetation previously identified in other surveys and are found only within the PEC boundary.

Vegetation types SH03 and SH04 (associated with creek lines) are found within the PEC boundary but are also widespread and well represented in the surrounding area away from the PEC. These vegetation types are not exclusive to the Weld Range PEC (*ecologia* 2020).

Vegetation type SH01 was found to be locally restricted within the surveyed area (*ecologia* 2020), but is considered likely to be present in the surrounding area. While locally restricted, no conservation significant species or vegetation associations were found to be associated with this vegetation type.

3.7 Introduced flora

A NatureMap database search identified 10 introduced weed species as potentially occurring within a 40 km radius of the project area. Three of these species were recorded during the July and September 2019 surveys. The weed species were recorded in few locations and occurred in low abundance (*ecologia* 2020a).

None of the weed species recorded during the survey are considered to be Weeds of National Significance or listed as Declared Pests on the Western Australian Organism List (Department of Primary Industries and Regional Development [DPIRD] 2020). While not located during the survey, *Rumex vesicarius* is listed as a Declared Pest and *Cenchrus ciliaris* is considered to be an environmental weed.

Weed surveys of the site have been completed in 2021 and 2022. Ruby dock (*Rumex vesicarius*) has been abundant along the public roads throughout the region for several years following periods of high rainfall. Only a single plant was located within the Iron Ridge tenements in 2022 and it was manually removed. A few canola plants (*Brassica napus*) were found along the haul road to the ROM. As with the ruby dock, these are common along the road verges in the region and have gradually spread as seed has been pushed by air movement created by vehicles. The sow thistles (*Sonchus asper* and *S. oleraceus*) and Maltese cockspur (*Centaurea melitensis*) are found throughout the state and, due to the long history of pastoral activity, are considered likely to have been present prior to the commencement of the operation but not recorded during the initial surveys.

Table 3.6 lists the weed species recorded during the surveys as well as those considered likely to be in the area.

Table 3.6: Weed species recorded and potentially occurring in the project area.

Scientific name	Common name	Recorded / likely
Brassica napus	Canola	Recorded (2022)
Carrichtera annua	Wards weed	Likely
Cenchrus ciliaris	Buffel grass	Likely
Centaurea melitensis	Maltese cockspur	Recorded (2022)
Cleretum papulosum subsp. *papulosum*		Likely
Cuscuta planiflora	Small seeded dodder	Recorded
Hypochaeris glabra	Smooth cats ear	Likely
Lysimachia arvensis	Pimpernel	Recorded
Pentameris pumila	False hairgrass	Likely
Rostraria pumila	Rough cats' tail	Recorded
Rumex vesicarius	Ruby dock	Recorded (2022)
Sisymbrium erysimoides	Smooth mustard	Likely
Sonchus asper	Prickly sow thistle	Recorded (2022)
Sonchus oleraceus	Common sow thistle	Recorded (2022)

3.8 Fauna and habitat

Database searches returned 199 vertebrate species having been recorded in and around the project area including 122 bird species, 42 reptiles, 28 mammals, two fish and two amphibians.

Nineteen vertebrate fauna species and one invertebrate species of conservation significance were identified from Threatened and Priority Fauna database searches of a 100 km radius from the study area including four mammals, 13 birds and two reptiles. Eight Threatened and eight migratory species were identified from the EPBC Act Protected Matters Search Tool along with 12 listed marine species.

Species listed as Marine or species not known to inhabit terrestrial environments are considered very unlikely to inhabit the project are and have been excluded from further discussion. The likelihood of these species occurring within the study area was assessed by *ecologia* based on desktop studies and surveys conducted in 2019.

Table 3.7 provides a summary of those conservation significant species occurring or likely to occur within the Project area. Previously recorded locations of conservation significant fauna are presented in Figure 3.5.

The northern shield-backed trapdoor spider, formerly recognised as *Idiosoma nigrum*, has been recorded in and around M20/118 on multiple occasions and is by far the most abundant conservation significant fauna species recorded in the area. Biologic Environmental Survey Pty Ltd (Biologic) undertook a status review of the species in April 2019 and confirmed that the trapdoor spider found in the project area is now regarded as *Idiosoma clypeatum*, a Priority 3 species under the WA Biodiversity Conservation Act (Biologic 2019). The letter report provided by Biologic is included in Appendix 2.

Intensive targeted surveys have previously been conducted throughout the Weld Range when the northern shield-backed trapdoor spider was regarded as *I. nigrum* and listed as a Vulnerable species under the WA Wildlife Conservation Act 1950. Over 1800 trapdoor burrows have been identified from database searches, the majority of which are from within the Weld Range. Targeted surveys previously conducted by Bamford Consulting Ecologists

(2009) and (Biologic 2012a) within tenement M20/118 recorded 135 burrows and 105 burrows respectively. The majority of burrows recorded were found on slopes with a southern aspect under narrow phyllode Acacias in a mix of clay and rocky substrates. Estimated population sizes within tenement M20/118 vary between the two data sets (3059 for the Bamford data and 4135 for the Biologic data). After analysing datasets within similar plant communities within and surrounding M20/118, Biologic (2012a) estimated the population size of *I. clypeatum* across the Weld Range to be 14,907 individuals. It was estimated that 27% of this population is within tenement M20/118 (*ecologia* 2020). The reports are included in Appendix 2.

Recorded locations of *I. clypeatum* are shown on Figure 3.5.

Table 3.7: Conservation significant fauna likelihood of occurrence.

Common name	Scientific name	EPBC status	WA status	Number of records	Latest record	Comments	Likelihood of occurrence pre-survey	Likelihood of occurrence post-survey
Mammals								
Bilby	*Macrotis lagotis*	VU	VU	1	1984	No suitable habitat present	Unlikely	Unlikely
Black-flanked rock-wallaby	*Petrogale lateralis lateralis*	EN	EN	1	?	No suitable habitat present	Unlikely	Unlikely
Ghost bat	*Macroderma gigas*	VU	VU	1	?	No suitable habitat present	Unlikely	Unlikely
Greater stick-nest rat	*Leporillus conditor*	VU	CD	2	2012	No suitable habitat present	Unlikely	Unlikely
Long-tailed dunnart	*Sminthopsis longicaudata*		P4		2009	Records in vicinity, suitable habitat present	Likely	Likely
Birds								
Blue-billed duck	*Oxyura australis*		P4	1	2000	No suitable habitat present	Unlikely	Unlikely
Caspian tern	*Hydroprogne caspia*	MI	IA	1	2013	No suitable habitat present	Unlikely	Unlikely
Common greenshank	*Tringa nebularia*	MI	IA	18	2013	No suitable habitat present	Unlikely	Unlikely
Common sandpiper	*Actitis hypoleucos*	MI	IA	3	2015	No suitable habitat present	Unlikely	Unlikely
Glossy ibis	*Plegadis falcinellus*	MI	IA	4	2005	No suitable habitat present	Unlikely	Unlikely
Gull-billed tern	*Gelochelidon nilotica*	MI	IA	4	2001	No suitable habitat present	Unlikely	Unlikely
Hooded plover	*Thinornis rubricollis*		P4	2	2015	No suitable habitat present	Unlikely	Unlikely
Marsh sandpiper	*Tringa stagnatilis*	MI	IA	4	2013	No suitable habitat present	Unlikely	Unlikely
Peregrine falcon	*Falco peregrinus*		OS	9	2017	Records in vicinity, has the potential to overfly the study area	Likely	Likely
Red-necked stint	*Calidris ruficollis*	MI	IA	3	2012	No suitable habitat present	Unlikely	Unlikely
Sharp-tailed sandpiper	*Calidris acuminata*	MI	IA	1	2007	No suitable habitat present	Unlikely	Unlikely
White-winged black tern	*Chlidonias leucopterus*	MI	IA	2	2015	No suitable habitat present	Unlikely	Unlikely
Wood sandpiper	*Tringa glareola*	MI	IA	4	2005	No suitable habitat present	Unlikely	Unlikely
Reptiles								
West coast mulga slider	*Lerista eupoda*		P1	21	2014	Previously recorded within the study area	Recorded	Recorded
Western spiny-tailed skink	*Egernia stokesii badia*	EN	VU	4	2010	Records in vicinity, some suitable habitat present	Possible	Unlikely
Invertebrate								
Northern shield-backed trapdoor spider	*Idiosoma clypeatum*		P3	1894	2016	Recorded within the study area	Recorded	Recorded

Figure 3.5: Database search records of conservation significant fauna within 50 km of the project area.

A Level 2 vertebrate fauna assessment conducted by *ecologia* in 2009 in the vicinity of the study area recorded three vertebrate species of conservation significance including the long-tailed dunnart (*Sminthopsis longicaudata* (P4 BC Act)), peregrine falcon (*Falco peregrinus* (OS BC Act)) and west coast mulga slider (*Lerista eupoda* (P1 BC Act)).

During a Reconnaissance survey of the Iron Ridge Project area in July 2019, *ecologia* recorded the northern shield-backed trapdoor spider and long-tailed dunnart, as well as Woolleys pseudantechinus (*Pseudantechinus woolleyae*), which is considered to be a locally significant species (not of conservation significance) due to its reliance on rocky habitat.

Ecologia also conducted a Level 1 fauna and fauna habitat assessment of the project area in September 2019, including a targeted survey for the northern shield-backed trapdoor spider. During this most recent survey, 15 vertebrate fauna species were identified including 13 birds, one mammal and one reptile. The northern shield backed trapdoor spider was also recorded in five additional locations (*ecologia* 2020a).

Four main habitat types were identified, as described in Table 3.8 and shown on Figure 3.6.

Table 3.8: Fauna habitat recorded in the study area.

Habitat type	Area (ha)	% study area	Condition
Acacia sp. Weld Range (A. Markey & S. Dillon 2994) and *Acacia speckii* shrubland on mid and lower slopes	22.95	4.29%	Excellent
Mulga woodland over ironstone ridge crests and slopes	58.82	10.99%	Excellent
Mixed *Acacia* shrublands over stony lower slopes and stony plains	407.54	76.16%	Excellent
Minor drainage line supporting dense shrubs	45.76	8.55%	Excellent
Total	**433**		

Acacia sp. Weld Range (A. Markey & S. Dillon 2994) and Acacia speckii shrubland on mid and lower slopes habitat occurs predominantly on the lower slopes and valleys on the northern margins of the study area. Associated soils include basalt-like rocks on stony slopes and loams on valley floors. This habitat type provides suitable substrates, vegetation and habitat to support the Priority 3 northern shield-backed trapdoor spider. This habitat is confined to the Weld Range where it is considered widespread. The project will result in minimal impact to this habitat and known locations of the species have been avoided.

Mulga woodland over ironstone ridge crests and slopes habitat is dominated by *Acacia aneura* shrublands over rocky banded ironstone ridges and slopes. The long-tailed dunnart has been recorded from widely scattered localities in the arid zone where it inhabits rugged, rocky areas, such as this habitat type. It typically occurs on plateaus near breakaways and scree slopes, and on rugged boulder-strewn scree slopes. Widely separated populations occur in the Pilbara, Murchison, Gibson Desert, southern Carnarvon Basin and in the Western MacDonnell Ranges (Northern Territory). The species was once considered rare but has recently been shown to be relatively common and widespread within rocky habitats, especially banded iron formation ranges within the Midwest. This habitat is suitable for Woolley's pseudantichinus and may also provide suitable breeding habitat for the peregrine falcon in places (rocky outcrops and overhangs). The pit and part of the waste dump are located in this habitat type. Impact to a localised area will therefore result from the proposed development.

Minor drainage line supporting dense shrubs habitat provides suitable habitat for the west coast mulga slider, which has been recorded on two previous occasions within the project area. This small fossorial lizard is known to inhabit open mulga woodland on red loams and sandy loams. Known from the arid interior of the Midwest of WA and endemic to the Murchison bioregion, this species has previously been recorded within Weld Range in leaf litter fringing drainage lines. This habitat exists around the project area but impact is expected to be minimal.

Mixed Acacia shrublands over stony lower slopes and stony plains habitat occurs throughout the southern portion of the project area and is the most widespread habitat present in the area. No conservation significant species have been recorded in this habitat, although the peregrine falcon is likely to utilise or fly over while foraging.

Most disturbance associated with the project will occur in this habitat type.

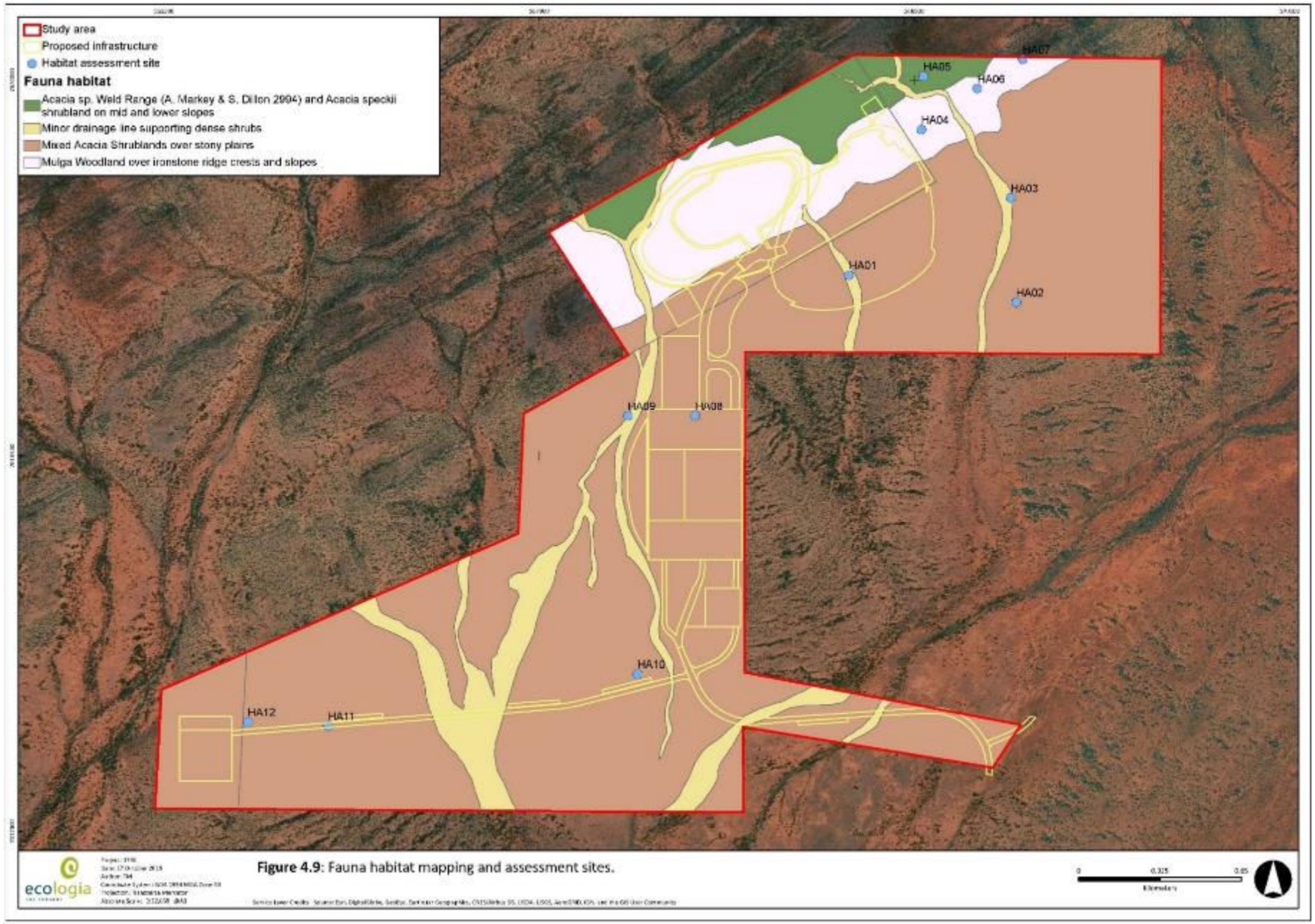


Figure 3.6: Fauna habitat in the project area.

3.9 Introduced fauna

Seven species of introduced mammal have previously been recorded around the project area. These include the dog, European red fox, feral cat, rabbit, house mouse, goat and cow. Goats, both feral and raised as pastoral stock, are known to generate high grazing pressure on the native vegetation of parts of the Weld Range.

3.10 Short-range endemics and subterranean fauna

Short-range endemics (SREs) are those fauna that have a naturally small range of less than 10,000 km^2. In addition, these species possess similar ecological traits including poor powers of dispersal, confinement to specialised often discontinuous habitats, slow growth and low fecundity (*ecologia* 2020c).

A SRE invertebrate habitat assessment of M20/118 was conducted in September 2011 by Biologic. The survey reported stated that "South-facing hills can be considered prospective, dependant on factors such as topography, geological structure and vegetation. The hills in the Study Area are steep and do offer protection from exposure to the sun but they are also very rocky and dominated by mulga. The steep slope and rockiness reduce the habitat's ability to capture, and consequently retain, moisture, an important factor in a habitat supporting an SRE community. In addition mulga dominated floristic communities tend to be less prospective, possibly due to the types of landscape positions and geologies they occur on, but possibly factors like the lack of species richness associated with such homogenous communities and the limited canopy and leaf litter available are also playing a role in reducing prospectivity. As such, the south-facing slopes in the Study Area are not considered prospective for SRE fauna" (Biologic 2011). The memo report by Biologic is included in Appendix 2.

Sampling of newly constructed bores for stygofauna was undertaken by *ecologia* in September 2019 (Phase 1), with a second round of sampling carried out in March 2020, six months after completion of the bores (Phase 2). No stygobitic species were collected from the two production bores sampled at Iron Ridge during either phase of the survey. One very juvenile stygobitic Crustacea from the Class Ostracoda was recorded at monitoring bore IRMB-C during phase one. This specimen was unidentifiable to species level (due to absence of mature morphological features); however, it is potentially from the family Cyprididae which is one of the most diverse groups of freshwater ostracods (*ecologia* 2020c).

In 2009 *ecologia* conducted a baseline stygofauna survey at Weld Range and surrounding pastoral land, which included sampling 84 drill holes (26 at Beebyn, 40 at Madoonga and 18 at the surrounding pastoral land outside the proposed area of impact), laboratory identifications and reporting, interpretation of the potential impacts and an associated risk assessment of the various project components on stygofauna communities or species. The Beebyn and Madoonga survey areas are in close proximity to the Iron Ridge study area and the surrounding pastoral bores provide good contextual information on a local and subregional scale (*ecologia* 2020c).

No stygobitic species or communities were identified during the previous stygofauna survey within the Beebyn impact area or in the regional pastoral bores, although stygophylic representatives of two crustacean orders (Ostracoda and Copepoda) and one annelid sub-class were recorded from nine pastoral wells. One stygobitic copepod from the order Calanoida found in a troglofauna trap at Madoonga suggests that stygofauna may be present in the wider area, though this was not able to be confirmed by stygofauna sampling in nearby bores. The stygophilic copepod found in regional bores, *Mesocyclops brooksi*, is known from both surface waters and ground waters, and it is widespread in Western Australia. The ostracods, *Cypridopsis vidua* and *Sarscypridopsis oschracea* are often found in wells in arid Western Australia but are typically surface species inhabiting open freshwater bodies in southern Western Australia. The results of the 2009 survey suggest that the groundwater habitat in and around the Beebyn impact area is depauperate of true stygofauna and therefore no risk assessment or management recommendations were necessary (*ecologia* 2020c).

Based on the results of the recent survey at the Iron Ridge project and previous survey work in the surrounding area, *ecologia* concluded that it is unlikely that the Iron Ridge Project will have any significant impacts on local stygofauna communities (*ecologia* 2020c). The *ecologia* stygofauna report is included in Appendix 2.

3.11 Hydrology

3.11.1 Surface water

Rockwater Pty Ltd was commissioned by Fenix to undertake a surface water assessment of the potential impact of flood flows on the mining area and to determine any bunding and drainage requirements for the mining area and infrastructure. The assessment was undertaken for the initial Stage 1 (starter) pit (Rockwater 2020a) and updated for the Stage 2 pit (Rockwater 2021). Assessment of the potential for impacts to surface water flows has been inferred from this analysis.

The Western Murchison contains the headwaters of the Murchison and Wooramel Rivers which drain westwards to the coast. Drainage lines in the proposed project area tend to drain in a southerly direction to Lake Austin.

The Iron Ridge mining area is elevated on a BIF ridge above major drainage lines. There is one small catchment, indicated by Catchment A1 on Figure 3.7, with an area of approximately 0.60 km^2. A minor drainage line on the north-western and western side of the proposed pit directs surface water from this catchment to the south. Rockwater assessed the catchment and the drainage line for potential of peak flows to impact the planned pit.

Analysis of the impact of a 1 in 100-year rainfall event on the minor flow path to the north-west and west of the proposed pit demonstrates that peak flows would be of relatively low flow, depth and velocity, however they would have an impact on the north-western edge of the planned pit which would extend into the floodplain. The maximum depth of the 1-in-100 year flood would be about 0.29 m and its maximum velocity in the order of 0.90 m/s (Rockwater 2020b).

At the western margin of the pit area, a 1 in 100-year rainfall event would have a slight impact on the western edge of the pit during large flood events. The maximum depth of the flood would be about 0.31 m and its maximum velocity in the order of 0.94 m/s (Rockwater 2020b).

Following completion of the design of the Stage 3 pit, Rockwater (2023) were asked to provide guidance on the impact of the abandonment bund on the natural drainage of the area to the north of the pit. The abandonment bund position had not been taken into consideration with previous surface water assessments. The abandonment bund will intersect several very minor drainage lines that feed into the ephemeral channel on the western side of the pit and result in Catchment A1 being separated into two sub catchments, as shown in Figure 3.7. Table 3.9 presents the sub catchment details and calculated peak flows.

Table 3.9: Catchment characteristics and peak flows.

Catchment	Area (km^2)	tc (hours)	Peak Flows (m^3/s)	
			1-in-100 year	PMF
A1	0.33	0.50	2.22	5.02
A2	0.08	0.29	0.56	1.82

To prevent periodic damming of water flows, a diversion channel will be located along the northern perimeter of the abandonment bund, directing surface water flows to the larger drainage line on the western side of the pit (**Error! Reference source not found.**). Table 3.10 outlines the dimensions of the diversion channel, considered as minimum requirements. The proposed channel would be sufficient to contain a Probable Maximum Flood (PMF) event post mining.

Table 3.10: Channel design.

Location	Base width (m)	Side slope (m/m)	Base gradient (m/m)	Manning's roughness (n)	Peak Depth, PMF (m)
Northern perimeter	2	2:1	0.015	0.02	0.51

A small area of surface water catchment will remain undisturbed within the abandonment bund (refer to Figure

3.8). A very minor drainage line, which is defined by the contours and slightly thicker vegetation (but difficult to identify even when on the ground in the area) will remain undisturbed in this area. The much reduced surface water runoff volume entering this drainage line will be allowed to flow its natural course. It is proposed to use very large rocks on top of a 320 mm culvert where it crosses the ephemeral creek to ensure it can withstand a PMF event post mining, and thus provide sufficient space for water to flow through and join the larger drainage channel, while still preventing inadvertent access to the pit from outside the bund.

The Rockwater Surface Water Assessment report is included in Appendix 3.

3.11.2 Groundwater

Rockwater was engaged to supervise the drilling, bore construction and test-pumping of five groundwater exploration holes, two of which were completed as test-production bores. Rockwater analysed the results of laboratory analysis and pump testing to determine the quantity and quality of water available for dust suppression and domestic use; to assess dewatering requirements; and to describe the hydrogeology of the deposit and surrounding area (Rockwater 2019).

The Weld Range is located in the East Murchison groundwater management unit. The groundwater in this area is characterised by fractured-rock and palaeochannel aquifers, alluvium and localised calcrete aquifers. Groundwater from fractured-rock aquifers can vary widely in terms of quality and quantity.

The main aquifers in the region are alluvium and colluvium with a tertiary palaeochannel passing through the Weld Range. The BIF strata which include the Iron Ridge deposit are commonly fractured, jointed and vuggy, and constitute aquifers of moderate to high permeability. The granitic and greenstone basement rocks (other than BIF) are generally of low permeability, including the dolerite associated with the BIF. The groundwater is recharged by the infiltration of rainfall and streamflow following high rainfall events. Groundwater flows in a north to south direction through the Weld Range and discharges into Lake Austin or a smaller temporary lake to the north.

Existing groundwater extraction in the area consists only of water for domestic use and stock watering at homesteads and on stations. The nearest recorded wells are Wilgie Mia and Yallon Wells, 5 km to the south and south-south-east respectively.

The groundwater is fresh to slightly brackish in the BIF and shallow alluvial aquifers, and is highly saline in alluvium and the palaeochannel aquifer west and south of the project area (Rockwater 2019).

The Rockwater report is included in Appendix 3.

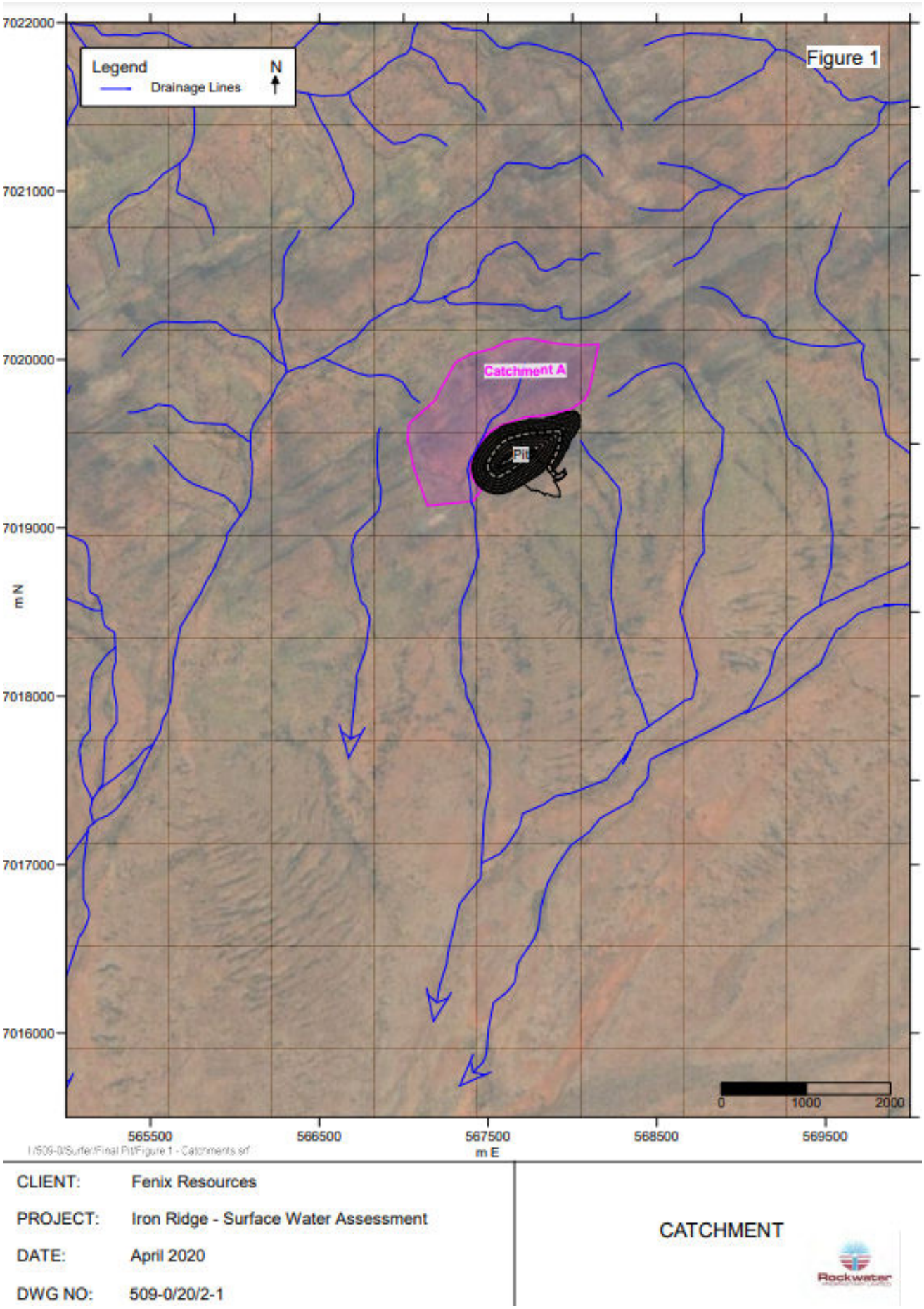


Figure 3.7: Surface water drainage lines and catchment area adjacent to the proposed Iron Ridge pit.

Figure 3.8: Stage 3 pit, abandonment bund and indicative location of the diversion drain.

3.11.3 Groundwater Dependent Ecosystems

The BoM Groundwater Dependent Ecosystems Atlas (BoM 2020) shows no known groundwater dependent ecosystems (GDE) nearby the project area. Although an initial desktop survey identified a potential moderate terrestrial GDE located 4km south of the project area, Rockwater's 2019 hydrology assessment affirmed the improbability of impacts on nearby GDEs, including stock bores and wells, due to the proposed pumping and dewatering activities (see Appendix 3). Further, an unofficial ground reconnaissance by Tracker Geoservices Pty Ltd has verified the absence of GDEs within the project area, deeming this risk for the project as low.

3.11.4 Pit lake formation

Rockwater was also engaged to assess the nature of the mine void to determine whether the pit might have a negative impact on the groundwater flow system. The assessment was undertaken for the full pit design and includes Stage 3, which reaches the 360RL (refer to Table 3.9). There will be no change to the pit lake information previously provided.

Once mining is completed, the water level in the pit will rise until a balance is established between the groundwater inflows plus rainfall accumulation and evaporation losses. The numerical groundwater model that was constructed to estimate dewatering requirements and the impacts of bore pumping (Rockwater 2020) was adapted to estimate long-term groundwater inflows to the pit at various pit water levels.

The pit will extend down from ground levels of 520 m to 570 m AHD, to a base elevation of 360 m AHD, 120 -160 m below the average natural ground level. The water balance for each 10 m pit water level below the water table (478 m AHD) is given in Table 3.11.

Table 3.11: Pit recharge water balance.

Pit Floor RL (m AHD)	Area (m^2)	GW Inflows (m^3/d)	Rain Accum. (m^3/d)	Evap. (m^3/d)	Balance (m^3/d)
Pit Rim	211,520	0	126		
470	99,840	103	126	679	-450
460	85,600	220	126	582	-236
450	72,160	327	126	491	-38
440	61,120	427	126	416	137
430	49,290	515	126	335	306
420	38,021	565	126	259	432
410	28,656	632	126	195	563
400	20,929	689	126	142	673
390	14,223	737	126	97	766
380	7,167	766	126	49	843
370	3,990	795	126	27	894
360	1,328	814	126	9	931

The recharge balance calculations indicate that the pit water level would stabilise at about 447.8 m AHD (Balance

= 0), 30.2 m below the static groundwater level, showing that the pit would become a permanent groundwater sink. There would, therefore, be no flow from the pit lake to groundwater and so there is no potential for groundwater contamination.

The rate of water-level rise following mining will decrease exponentially due to the increasing pit volume and decrease in groundwater inflows, taking about 49 years for the water level to stabilise. The salinity of the pit water would gradually increase from about 570 mg/L TDS when the pit first begins to fill with water, to about 3,500 mg/L TDS 100 years after the end of mining.

The Rockwater Assessment of Final Mine Void report is included in Appendix 3.

Pit water is expected to become a resource for pastoral activity post-mining. Regular extraction is expected to limit salinisation of the pit water.

4 IMPACTS AND MANAGEMENT

4.1 Impact to conservation significant flora

No additional impacts to Priority flora will occur as part of the Stage 3 operation.

Eight Priority listed flora species have been recorded in and around the project area. Six of these will be impacted by the proposed development. All eight species are widespread and well represented in the Weld Range and surrounding area. Table 4.1 provides the number of individuals of each species to be impacted, the number of individuals in the local population and the percentage impact to that population as a resulting of development of the project. Note that "local population", as described by *ecologia* (2020a) refers to the population of the species within and nearby the surveyed area.

Following identification of a high number of individuals of *Micromyrtus placoides* to be impacted by the proposed waste dump, additional work was undertaken by *ecologia* to determine the population in the wider area (*ecologia* 2020b and d). The local population, as listed in Table 4.1, has increased by more than 20,000 individuals since the initial survey work was completed. This has resulted in the Iron Ridge Project's impact to the species decreasing significantly.

It is expected that the actual numbers of priority species in the Weld Range area will be significantly higher than is currently known as the areas not prospective for mining have generally not been surveyed.

Table 4.1: Impact to Priority flora.

Taxon	Individuals recorded within proposed infrastructure envelope	Local population (% impact)
Priority 1		
Acacia dilloniorum	21	6164 (0.3%)
Stenanthemum patens	1	391 (0.2%)
Priority 3		
Hemigenia virescens	0	41 (0)
Micromyrtus placoides	3564	33,724 (10.6%)
Prostanthera petrophila	63	1062 (5.9%)
Priority 4		
Acacia speckii	21	725 (2.9%)
Dodonaea amplisemina	10	551 (1.8%)
Grevillea inconspicua	0	105 (0)

Approximately 10.6% of the known *Micromyrtus placoides* (P3) local population will be impacted by the project, with no additional impact resulting from the proposed expansion.

This is viewed as the key potential impact to conservation significant flora. Proposed impact to each of the other Priority species is minor and is not assessed further. The management strategies proposed will ensure the potential for further impact to these species is minimised.

4.1.1 Management actions

To offset the impact to *Micromyrtus placoides*, Fenix proposes to:

- stockpile vegetation and growth media from areas known to support *M. placoides* separately from other stockpiled material, and provide signage to delineate this material as "Priority Topsoil". This material is likely to contain *M. placoides* seed and will be used in rehabilitation.
- undertake rehabilitation trials using the growth media containing *M. placoides* seed as soon as practical to determine whether the species will regenerate in disturbed areas, and the best methods to facilitate this.
- undertake periodic surveys of suitable habitat in the surrounding area to determine the size and extent of the *M. placoides* population.

To minimise further impact to *M. placoides* and other Priority flora species, Fenix will:

- implement a Site Disturbance Permit system with strict survey controls and requiring sign off by the Registered Manager prior to clearing commencing.
- clearly delineate areas to be cleared using survey pegs and coloured flagging tape and record ("pick up") cleared areas on completion.
- maintain records of clearing undertaken.
- provide information to site personnel by way of an induction and specific training where necessary to identify conservation significant species and highlight the importance of clearing protocols.

4.2 Impact to significant vegetation and ecological systems

No State (BC Act) or Commonwealth (EPBC Act) listed Threatened Ecological Communities (TECs) occur within the project area. There are seven Priority Ecological Communities (PECs) recorded within 50 km of the project. Figure 4.1 shows the location of the project tenements in relation to the Weld Range PEC, as well as the other PECs within a 50 km radius (*ecologia* 2020a).

The project area partly coincides with the Priority 1 PEC Weld Range Vegetation Complexes (banded ironstone formation) (DBCA 2019). Figure 4.2 shows the PEC boundary and vegetation in relation to the proposed project layout. The PEC boundary defined by DBCA includes a 500 m "administrative buffer". Approximately 67 ha of disturbance proposed for the project will occur within the PEC, inclusive of the buffer zone. This equates to 0.26% of the buffered Weld Range PEC.

Most of the vegetation in the project area within this buffer zone is not vegetation associated with the PEC. As such, assessment of impacts to the PEC are based on the areas of disturbance that impact vegetation known to be associated with, and located within, the actual PEC boundary, indicated by the red line on Figure 4.2.

Vegetation types SH02, SH05 and SH07 correspond to PEC vegetation previously identified in other surveys (refer to Section 3.6) and are found only within the PEC boundary.

Vegetation types SH03 and SH04 (associated with creek lines) are found within the PEC boundary but are also widespread and well represented in the surrounding area away from the PEC. These vegetation types are not exclusive to the Weld Range PEC (*ecologia* 2020a).

Vegetation type SH01 was found to be locally restricted within the surveyed area (*ecologia* 2020a), but is considered likely to be present in the surrounding area. While locally restricted, no conservation significant species or vegetation associations were found to be associated with this vegetation type.

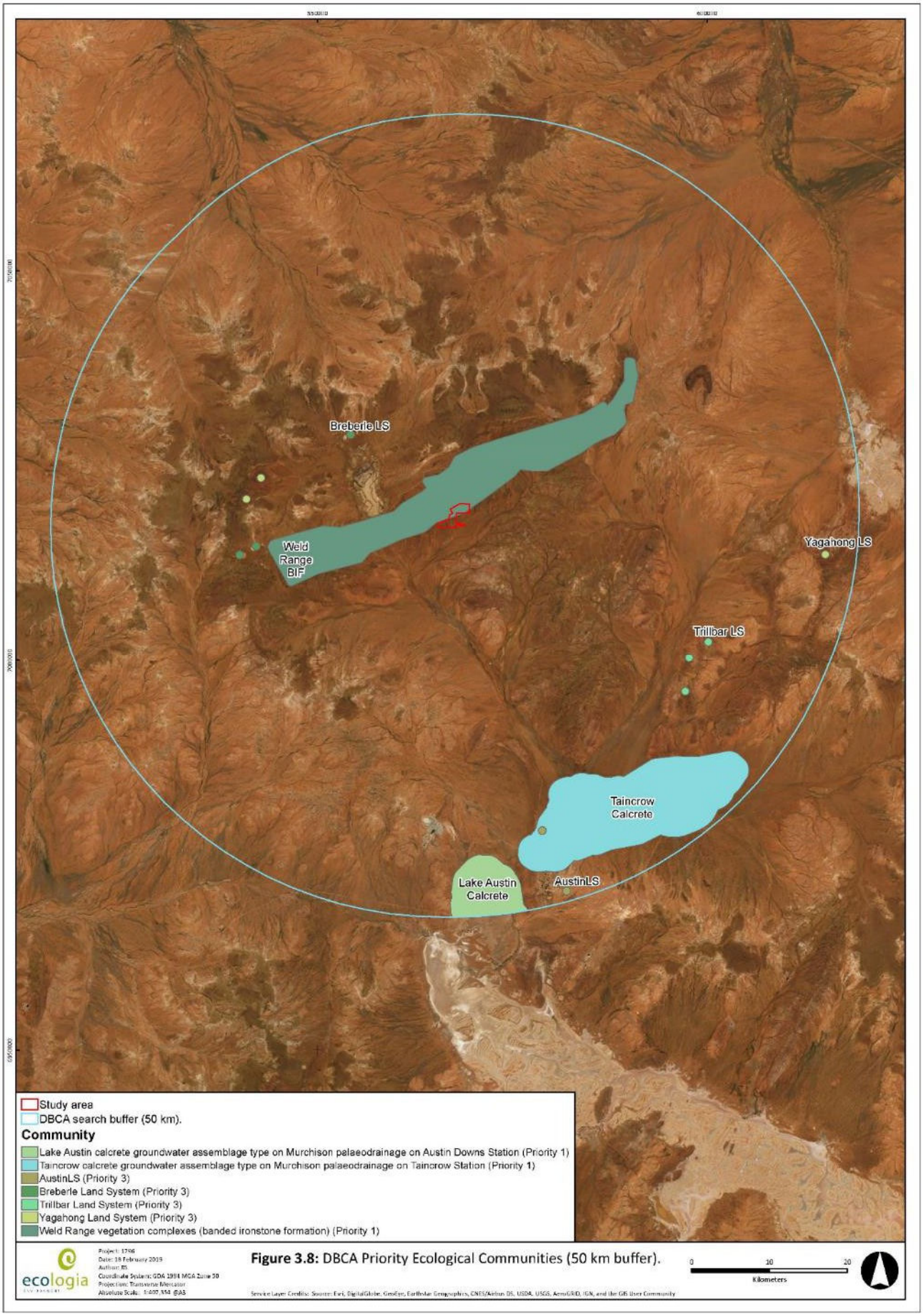


Figure 4.1: Priority Ecological Communities within a 50 km radius of the project.

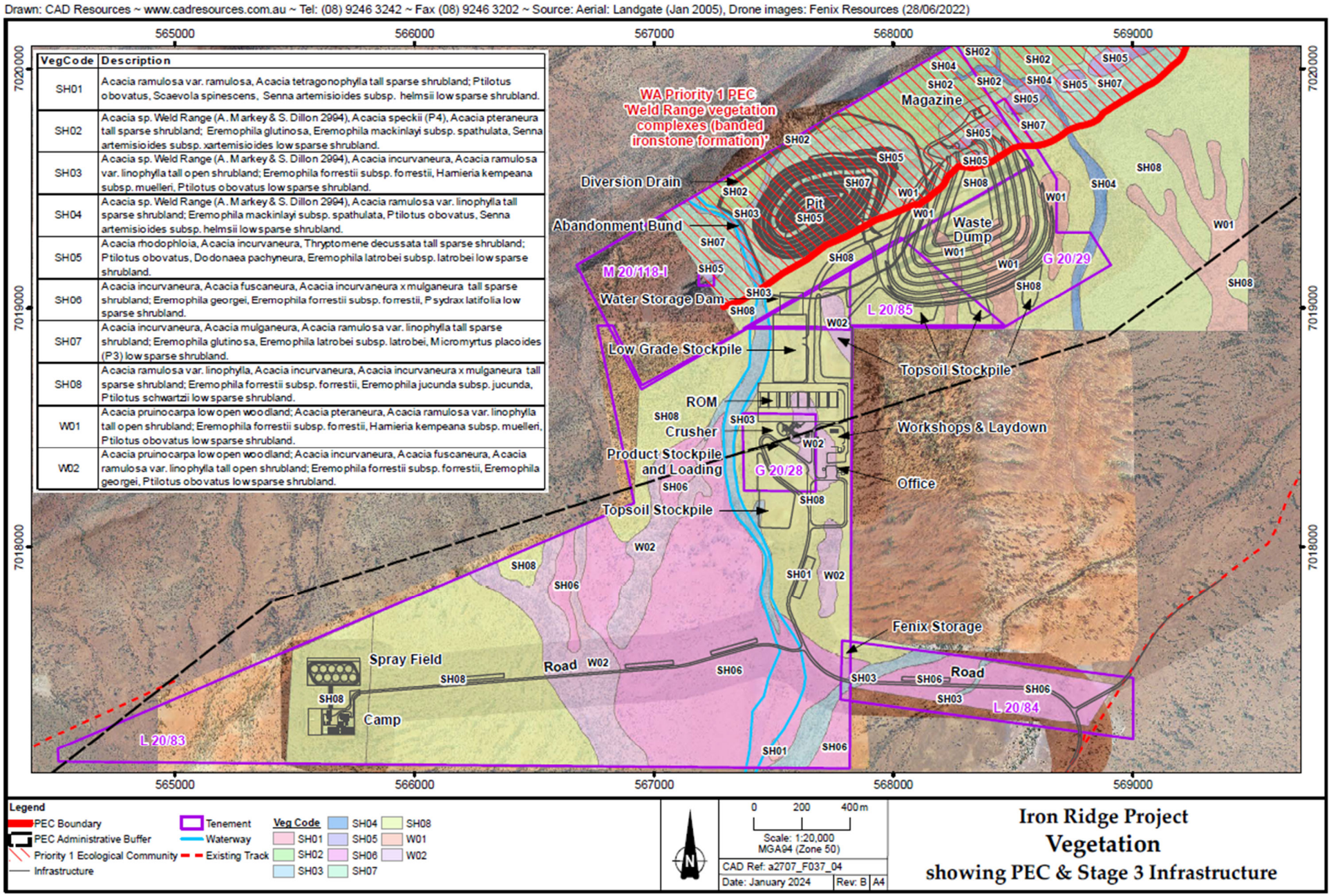


Figure 4.2: The Weld Range PEC, vegetation and proposed project layout.

Table 4.2 summarises the significance of each of the vegetation types in the project area that are associated with the PEC, the planned area of disturbance to each and the percentage impact to the PEC as a result. The Stage 3 disturbance footprints for the pit and waste dump were used for this impact assessment by *ecologia.* The area of disturbance to vegetation associated with the Weld Range PEC equates to less than 1% of the PEC and is therefore not considered to be a significant impact.

Table 4.2: Impact to PEC vegetation.

Vegetation type and significance	Proposed impact (ha)	% impact to PEC
SH02 Supports *Acacia dilloniorum* (P1) and *Stenanthemum patens* (P1).	0.36	0.001
SH05 Supports *Stenanthemum patens* (P1)	2.84	0.011
SH07 Supports *Acacia dilloniorum* (P1) and *Stenanthemum patens* (P1)	26.89	0.102

4.2.1 Management actions

To minimise further impact to vegetation associated with the Weld Range PEC, Fenix will:

- implement a Site Disturbance Permit system with strict survey controls and requiring sign off by the Registered Manager prior to clearing commencing.
- clearly delineate areas to be cleared using survey pegs and coloured flagging tape and record ("pick up") cleared areas on completion.
- maintain records of clearing undertaken.
- provide information to site personnel by way of an induction and specific training where necessary to identify conservation significant vegetation and highlight the importance of clearing protocols.

4.3 Introduced flora species

The vegetation in the vicinity of the Iron Ridge Project is in very good to excellent condition. The weed presence is of low abundance and in few locations.

Weed seeds can be transported in soil and vegetative material attached to the machinery and equipment. Weeds can be introduced to site via machinery and equipment that has come from weed infested areas without being cleaned.

4.3.1 Management actions

To minimise the potential for new (and potentially invasive) weed species to be introduced to the site, Fenix will require that:

- machinery and equipment is thoroughly cleaned prior to being mobilised to site.
- contractors provide a weed hygiene certificate for each item of machinery bought to site.
- machinery and equipment that arrives on site will be inspected. Machinery that does not meet the hygiene requirements will require removal and additional cleaning in an appropriate location.

The potential spread of weed species and establishment of new weed populations will be minimised by:

- regular monitoring of disturbed areas and road verges to identify weeds
- identifying weeds species, abundance and cover during rehabilitation monitoring
- control of weed outbreaks using herbicide or manual removal
- preventing stock access to rehabilitated areas
- educating site personnel by way of the site induction.

5 ASSESSMENT AGAINST THE 10 CLEARING PRINCIPLES

(1) **Native vegetation should not be cleared if it comprises a high level of biological diversity.**

The most recent survey of the project area (*ecologia* 2020a) recorded 171 vascular plant taxa from 49 families and 134 genera. 10 vegetation types were identified, three of which are associated with the Priority 1 Weld Range PEC.

While BIF ranges in general are considered to have significant biodiversity value because of their unique geology, soils and relative isolation, the Weld Range was described as being a "lower biodiversity value site, although still providing refugial habitats with localised species and vegetation communities" (DEC 2007).

Less than 1% of vegetation associated with the Weld Range PEC will be impacted by the development.

Clearing of native vegetation within the area is not considered to be at variance to this principle.

(2) **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.**

Although several species of conservation-significant fauna have been recorded within the project area, and some may potentially utilise the area as part of a broader foraging habitat, the area is not considered to provide habitat necessary for the survival of these species. The fauna habitat to be impacted by the project is well represented in the surrounding area and accounts for a very small proportion of available habitat.

Clearing of native vegetation within the area is not considered to be at variance to this principle.

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

The area does not coincide with any previously recorded Rare flora taxa, and no Rare flora species are listed as potentially occurring in the area. Accordingly, the area is not considered necessary for the continued existence of Rare flora.

Additional survey work was undertaken in 2020 by *ecologia* to determine the population of *Micromyrtus placoides* in area surrounding the project (*ecologia* 2020b and c). As a result, the local population of the species increased by more than 20,000 individuals to more than 33,000. The species appears to be locally abundant in suitable areas and is well represented within the surrounding region. Approximately 10.6% of the known local population of the Priority 3 species was impacted by Stage 1 and Stage 2 of the project, approved under CPS 8891/1. No additional impact will result from Stage 3.

Clearing of native vegetation within the area is not considered to be at variance to this principle.

(4) **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.**

The project area does not coincide with any Threatened Ecological Communities listed under the *Environment Protection and Biodiversity Conservation Act 1999* (C'th). Accordingly, the area is not considered necessary for the maintenance of a Threatened Ecological Community.

Development of the project will result in impact to less than 1% of vegetation associated with the Priority 1 Priority Ecological Community "Weld Range vegetation complexes (banded ironstone formation)".

Clearing of native vegetation within the area is not considered to be at variance to this principle.

***(5)* Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.**

The project area supports 10 distinct vegetation types, none of which have been extensively cleared nor can be considered remnant vegetation.

Clearing of native vegetation within the area is not considered to be at variance to this principle.

***(6)* Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.**

The project area does not contain native vegetation that is within or associated with any significant watercourse or wetland. The nearest significant surface water feature is Lake Austin, more than 50 km from the site.

Several minor ephemeral drainage lines pass through the area. The project has been designed to avoid these in the majority. Road crossings will be required at several locations but disturbance to vegetation will be minimal.

Clearing of native vegetation within the area is not considered to be at variance to this principle.

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

None of the vegetation in the area is associated with land that is recognised as being particularly susceptible to land degradation. Appropriate surface water drainage and containment around cleared areas will minimise the potential for surface water erosion. Land degradation resulting from clearing of vegetation is considered unlikely.

Clearing of native vegetation within the area is not considered to be at variance to this principle.

***(8)* Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.**

The project area partly coincides with Priority 1 PEC “Weld Range vegetation complexes (banded ironstone formation)”. Approximately 76 ha of disturbance proposed for the project will occur within the PEC, inclusive of the buffer zone (an increase of 9 ha). This equates to less than 0.3% of the buffered Weld Range PEC. This includes the proposed Stage 3 disturbance of 8.6 ha or 0.04 % of the buffered Weld Range PEC.

Clearing of 30.09 ha of vegetation is exclusively associated with PEC vegetation and accounts for approximately 0.11% of the Weld Range PEC vegetation.

Clearing of native vegetation within the area is not considered to be at variance to this principle.

***(9)* 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.**

The project has been designed to minimise impact to a number of small ephemeral drainage lines. Drainage and containment structures incorporated into the development areas will ensure surface water runoff is controlled and minimise the potential for contaminants and sediment to enter the surface water system.

Clearing of vegetation is not anticipated to have any impact on the groundwater system. Clearing of native vegetation within the area is not considered to be at variance to this principle.

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

The project area is elevated with surface water runoff flowing generally in a southerly direction. Runoff from cleared areas will be directed toward the perimeter where appropriate drainage and containment structures will be in place. Flooding of the area is considered very unlikely.

Clearing of native vegetation within the area is not considered to be at variance to this principle.

6.0 REFERENCES

Bamford Consulting Ecologists. 2009. *Weld Range Direct Shipping Ore Project targeted Shield-backed Trapdoor Spider, SRE Invertebrate and Vertebrate Fauna Survey*. Unpublished report prepared for Atlas Iron Ltd.

Biologic Environmental. 2011. *Weld Range SRE habitat assessment*. Unpublished memo report prepared for Atlas Iron Ltd, November 2011.

Biologic Environmental. 2012. *Weld Range Idiosoma nigrum survey*. Unpublished report prepared for Atlas Iron Ltd.

Biologic Environmental. 2019. *Idiosoma Review*. Unpublished memo report prepared for Ecotec (WA) Pty Ltd on behalf of Fenix Resources.

Bureau of Meteorology. 2020. *Groundwater Dependent Ecosystems Atlas*. http://www.bom.gov.au/water/groundwater/gde/. [Accessed March 2020].

Department of Agriculture, Water and Environment. 2019. *Rangelands 2008 – Taking the Pulse; Murchison Bioregion*. https://www.environment.gov.au/system/files/resources/a8015c25-4aa2-4833-ad9c-e98d09e2ab52/files/bioregion-murchison.pdf

Department of Environment and Conservation. 2007. *Banded Ironstone Formation Ranges of the Midwest and Goldfields - Interim Status Report - Biodiversity Values and Conservation Requirements*. September 2007.

Department of Industry and Resources. 2009. *Clearing Permit Decision Report – Tallering Peak Iron Ore Mine.*

***ecologia* Environment. 2020a.** *Iron Ridge Biological Survey 2019*. Unpublished report prepared for Fenix Resources, March 2020.

***ecologia* Environment. 2020b.** *Micromyrtus placoides (Priority 3) Impact Assessment, Iron Ridge*. Unpublished memo report prepared for Fenix Resources, April 2020.

***ecologia* Environment. 2020c.** *Iron Ridge Stygofauna Assessment*. Unpublished memo report prepared for Fenix Resources, April 2020.

***ecologia* Environment. 2020d.** *Micromyrtus placoides Targeted Survey Findings, Fenix Iron Ridge Iron Ore Project*. Unpublished memo report prepared for Fenix Resources, August 2020.

Markey, A. S. and Dillon, S. J. 2008. *Flora and vegetation of the banded iron formations of the Yilgarn Craton: the Weld Range*. Science Division: Department of Environment and Conservation, Wanneroo, Western Australia.

Rockwater Pty Ltd. 2019. *Bore Completion and Hydrogeological Assessment*. Unpublished report prepared for Fenix Resources Ltd, September 2019.

Rockwater Pty Ltd. 2020a. *Surface Water Assessment (Starter Pit)*. Unpublished report prepared for Fenix Resources Ltd, April 2020.

Rockwater Pty Ltd. 2020b. *Assessment of Final Mine Void*. Unpublished report prepared for Fenix Resources Ltd, March 2020.

Rockwater Pty Ltd. 2021. *Surface Water Assessment (Phase 2 Pit)*. Unpublished report prepared for Fenix Resources Ltd, March 2021.

Rockwater Pty Ltd. 2023. *Diversion of Surface Water Flows, Iron Ridge Pit*. Unpublished memorandum prepared for Ecotec (WA), April 2023.

Tille, Peter J. 2006. *Soil-Landscapes of Western Australia's Rangelands and Arid Interior*. Resource Management Technical Reports. Department of Agriculture and Food.

Woodman Environmental. 2009. *Atlas Iron Ltd: Weld Range DSO Project, Flora and Vegetation Assessment 2009*. Prepared by Woodman Environmental Consulting for Atlas Iron Ltd.

Woodman Environmental. 2012. *Atlas Iron Ltd: Weld Range DSO Project, Local and Regional Significant Flora Assessment 2012*. Prepared by Woodman Environmental Consulting for Atlas Iron Ltd.