



# Clearing Permit Decision Report

## 1. Application details and outcomes

### 1.1. Permit application details

<b>Permit number:</b>	2160/4
<b>Permit type:</b>	Purpose Permit
<b>Applicant name:</b>	BHP Iron Ore Pty Ltd
<b>Application received:</b>	3 August 2023
<b>Application area:</b>	105 hectares
<b>Purpose of clearing:</b>	Mineral exploration, hydrological investigations, geotechnical investigations, weather masts, supporting infrastructure and associated activities
<b>Method of clearing:</b>	Mechanical Removal
<b>Tenure:</b>	<i>Iron Ore (Mount Newman) Agreement Act 1964</i> , Mineral Lease 244 SA (AML 70/244)
<b>Location (LGA area/s):</b>	Shire of East Pilbara
<b>Colloquial name:</b>	Ninga Exploration Project

### 1.2. Description of clearing activities

BHP Billiton Iron Ore Pty Ltd proposes to clear up to 105 hectares of native vegetation within a boundary of approximately 1,779 hectares, for the purpose of mineral exploration, hydrological investigations, geotechnical investigations, weather masts, supporting infrastructure and associated activities. The project is located approximately 20 kilometres east of Newman, within the Shire of East Pilbara.

Clearing permit CPS 2160/1 was granted by the Department of Industry and Resources (now the Department of Mines, Industry Regulation and Safety) on 22 May 2008 and was valid from 21 June 2008 to 1 September 2013. The permit authorised the clearing of up to 105 hectares of native vegetation within a boundary of approximately 1,776 hectares, for the purpose of mineral exploration.

CPS 2160/2 was granted by the Department of Mines and Petroleum (now the Department of Mines, Industry Regulation and Safety) on 28 March 2013, amending the permit to extend the permit duration to 30 June 2028, to change the annual clearing permit report date to 1 October and adding the purposes of hydrological investigations, geotechnical investigations, supporting infrastructure and associated activities. The area of clearing authorised and the permit boundary remained unchanged.

CPS 2160/3 was granted by the Department of Mines, Industry Regulation and Safety on 18 June 2020 to add 'weather masts' as an additional purpose for clearing, extend the permit duration to 30 November 2028 and extend the period in which clearing is authorised to 30 November 2023. The area of clearing authorised and the permit boundary remained unchanged.

On 3 August 2023, BHP Billiton Iron Ore Pty Ltd applied to amend CPS 2160/3 to extend permit duration to 30 November 2033, extend clearing period to 30 November 2027, update permit holder name to BHP Iron Ore Pty Ltd, remove areas of clearing within permit boundary and remove condition 9(a) and (b)(i) from the native vegetation clearing permit. The area of clearing authorised remains unchanged.

### 1.3. Decision on application and key considerations

<b>Decision:</b>	Grant
<b>Decision date:</b>	2 November 2023
<b>Decision area:</b>	105 hectares of native vegetation

### 1.4. Reasons for decision

This clearing permit application was made in accordance with section 51KA(1) of the *Environmental Protection Act 1986* (EP Act) and was received by the Department of Mines, Industry Regulation and Safety (DMIRS) on 3 August 2023. DMIRS advertised the application for a public comment for a period of 7 days, and no submissions were received.

In making this decision, the Delegated Officer had regard for the site characteristics (Appendix A.1), relevant datasets (Appendix D), the clearing principles set out in Schedule 5 of the EP Act (Appendix B), proposed avoidance and minimisation measures (Section 3.1), relevant planning instruments and any other matters considered relevant to the assessment (Section 3.3).

The assessment identified that the proposed clearing may result in:

- the potential introduction and spread of weeds into adjacent vegetation, which could impact on the quality of the adjacent vegetation and its habitat values;
- the loss of riparian vegetation;
- the loss of priority flora species; and
- the loss of suitable habitat for a number of conservation significant fauna species.

After consideration of the available information, as well as the applicant's minimisation and mitigation measures (see Section 3.1), the Delegated Officer determined the proposed clearing can be minimised and managed to be unlikely to lead to an unacceptable risk to environmental values.

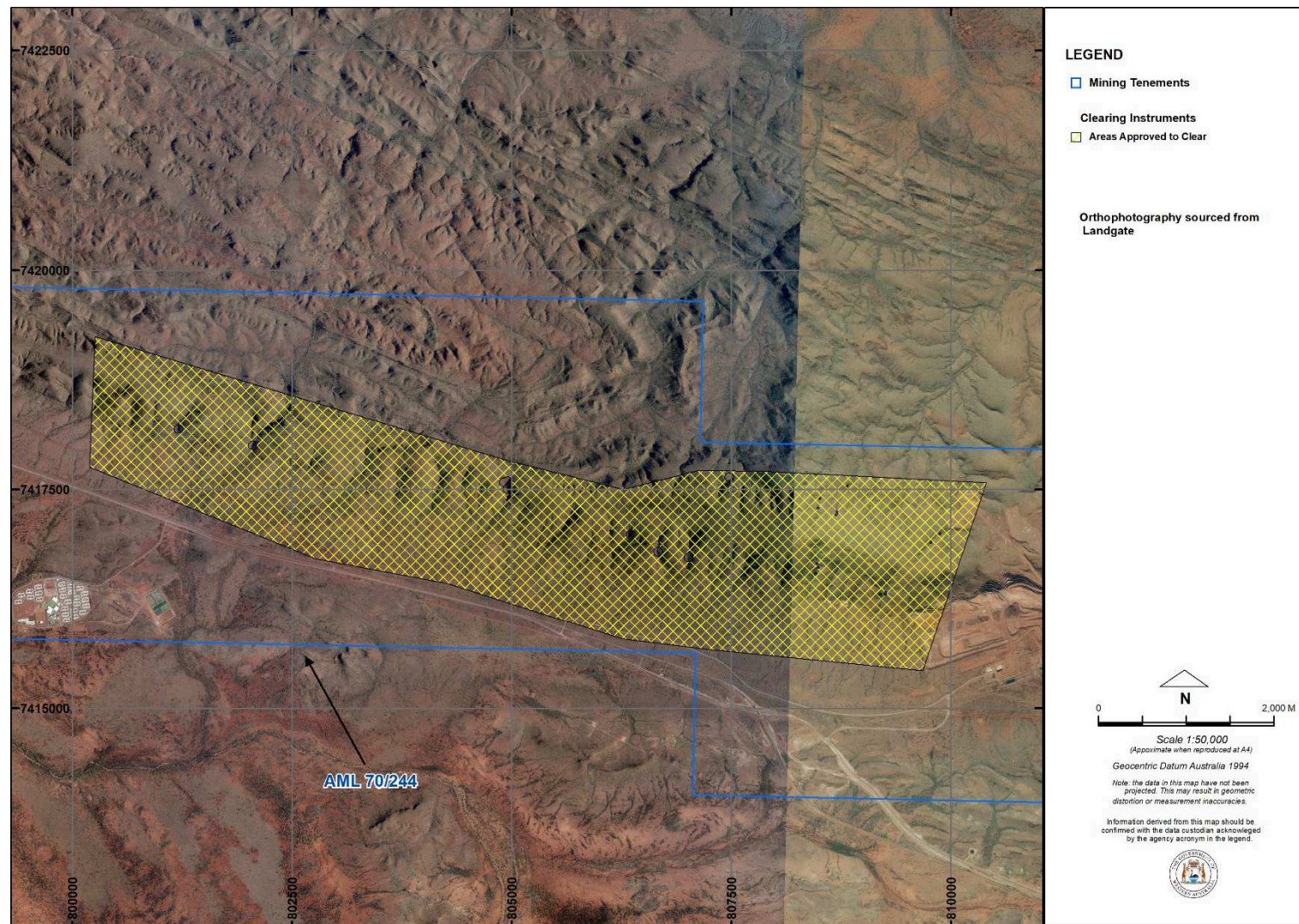
The conditions currently imposed on clearing permit CPS 2160/4 are considered adequate to manage the impacts of clearing:

- avoid, minimise to reduce the impacts and extent of clearing;
- take hygiene steps to minimise the risk of the introduction and spread of weeds;
- watercourse management condition to reduce the impacts to riparian vegetation; and
- flora management condition restricting clearing within 10 meters of identified priority species.

Additional biological surveys provided by the Permit Holder has resulted in change of variance against the clearing principles (a), (b), (c), (g), and (i) since the assessment for CPS 2160/3. The Delegated Officer determined that the proposed amendment CPS 2160/3 to extend clearing period and permit duration by five years, update permit holder name, remove areas of clearing within permit boundary, and remove condition 9(a) and 9(b)(i) on the clearing permit is not likely to lead to an unacceptable risk to environmental values. The flora management condition (condition 9) on the permit will be amended to reflect priority flora species only.

## 1.5. Site map

A site map of proposed clearing is provided in Figure 1 below.



**Figure 1. Map of the application area. The yellow area indicates the area within which conditional authorised clearing can occur under the granted clearing permit. The red areas indicate areas where clearing is restricted.**

## 2. Legislative context

The clearing of native vegetation in Western Australia is regulated under the EP Act and the Environmental Protection (Clearing of Native Vegetation) Regulations 2004 (Clearing Regulations).

In addition to the matters considered in accordance with section 51O of the EP Act (see Section 1.4), the Delegated Officer has also had regard to the objects and principles under section 4A of the EP Act, particularly:

- the precautionary principle
- the principle of intergenerational equity
- the principle of the conservation of biological diversity and ecological integrity.

Other legislation of relevance for this assessment include:

- *Biodiversity Conservation Act 2016* (WA) (BC Act)
- *Conservation and Land Management Act 1984* (WA) (CALM Act)
- *Country Areas Water Supply Act 1947* (WA) (CAWS Act)
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act)
- *Mining Act 1978* (WA)
- *Iron Ore (Mount Newman) Agreement Act 1964*

The key guidance documents which inform this assessment are:

- *A guide to the assessment of applications to clear native vegetation* (DER, December 2014)
- *Procedure: Native vegetation clearing permits* (DWER, October 2021)
- Technical guidance – *Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016)

## 3. Detailed assessment of application

### 3.1. Avoidance and mitigation measures

Evidence was submitted by the applicant demonstrating avoidance and mitigation measures listed below will be undertaken:

- All identified waterholes and caves have been removed from the application area;
- Populations of Priority flora will be avoided by a 10 metre buffer where practicable;
- Control of established weed populations will be carried out according to BHP's standard Weed Control and Management Procedures;
- In the event that active Mulgara burrows are identified they will be avoided using a 10 metre buffer, where practicable;
- Active mounds of the Western Pebble-mound Mouse will be avoided using a 10 metre buffer, where practicable; and
- Where practicable, existing cleared tracks will be used to cross the unnamed non-perennial minor drainage line. If it is necessary for new crossings to be installed, clearing will be kept to a bare minimum and will be constructed flat level to the surface (i.e. a simple clearing with no bunds) to maintain the natural surface flow (BHP Iron Ore Pty Ltd, 2023).

The Delegated Officer was satisfied that the applicant has made a reasonable effort to avoid and minimise potential impacts of the proposed clearing on environmental values.

### 3.2. Assessment of impacts on environmental values

A review of current environmental information (Appendix B) reveals that the assessment against the clearing principles changed in variance against principles; (a), (b), (c), (g), and (i) from the Clearing Permit Decision Report CPS 2160/3. Biological surveys provided to the Department by the Permit Holder demonstrated additional environmental impacts towards the local biodiversity and groundwater quality caused by the proposed clearing which were found to may be at variance against principles; (a), (b), (g), and (i) since the assessment for CPS 2160/3. These biological surveys further led to the re-assessment of the environmental impacts towards threatened flora and found the proposed clearing would not likely be at variance to principle (c) as no threatened flora were recorded within the application area. Given the nature of clearing, the avoidance and mitigation commitments made by the Permit Holder and the conditions placed on the permit, the clearing is not considered to result in significant impacts to this community.

In assessing the application, the Delegated Officer has had regard for the site characteristics (Appendix A.1) and the extent to which the impacts of the proposed clearing present a risk to biological, conservation, or land and water resource values. The assessment against the clearing principles identified that the impacts of the proposed clearing present a risk to environmental values (flora and fauna habitat). The consideration of these impacts, and the extent to which they can be managed through conditions applied in line with sections 51H and 51I of the EP Act, is set out below.

#### 3.2.1. Biological values (flora) – Clearing principles (a) and (c)

##### Assessment

Astron Environmental Services was commissioned to undertake a Level 2 Vegetation and Flora Assessment within the wider Ninga Project Area between 14 to 22 April 2013 (Astron, 2013). The survey area covered approximately 3,898 hectares starting approximately seven kilometres west of the application area traveling in an easterly direction for approximately 14 kilometres. Despite the flora and vegetation assessment completed on approximately 70 per cent of the application area, due to the consistent vegetation associations, land systems and landforms throughout the application area, the flora and vegetation assessment is found sufficient in providing the potential environmental impacts caused by the proposed clearing.

BHP Iron Ore further commissioned a detailed flora and vegetation survey of East Ophthalmia and Ninga area undertaken by Spectrum (Spectrum, 2022). The assessment was undertaken over two phases. The first phase was conducted over nine days from 29 March to 6 April 2022, following marginally higher than median rainfall in the preceding three months, than the sum of the long-term median, and the second phase was conducted over seven days from 2 to 8 August 2022, following unseasonal high winter rainfall for the three months preceding the survey (Spectrum, 2022). The field survey consisted of 43 quadrats, 20 relevés, and approximately 179 kilometres of targeted traverses sampled during the assessment. Of the total 43 quadrats, 33 quadrats were installed during the first phase and ten quadrats were installed during the second phase. Fifteen (45%) of the quadrats installed during phase one, were re-scored in phase two (Spectrum, 2022). The survey area covered only approximately 70 per cent of the application area, however, due to the consistent vegetation associations, land systems and landforms throughout the application area, the flora and vegetation assessment is found sufficient in providing the potential environmental impacts caused by the proposed clearing.

Despite the flora and vegetation assessments commissioned by The Permit Holder failing to cover the entirety of the application area, both field surveys were undertaken in accordance with the recommended survey timing as outlined in the EPA guidelines (EPA, 2016). Results from all field assessments commissioned by the Permit Holder did not record any threatened flora within both the survey area and the application area (Astron, 2013; Spectrum, 2022), furthermore, a desktop assessment provided no historical records of threatened flora occurring within the application area (GIS Database). Due to the intensity and minimal limitations of the field assessments undertaken, the potential for threatened flora species occurring within the application area is highly unlikely and therefore the removal of Flora Management condition 9(a) and (b)(i) from the amended clearing permit as requested by the Permit Holder is found acceptable.

### Flora

The Vegetation and Flora Assessments conducted over the application area (Astron, 2013; Spectrum, 2022) recorded three priority flora species within the application area:

- *Aristida jerichoensis* var. *subspinulifera* (P3)
- *Triodia* sp. *Mt Ella* (P3)
- *Isotropis parviflora* (P3)

*Aristida jerichoensis* var. *subspinulifera* (P3) was recorded within the application area at two different locations, and a third location was recorded approximately one kilometre west of the application area (BHP, 2023). All three records lie within a 100 meter radius of the Jimblebar Rail Spur (BHP, 2023). The two recorded locations of *Aristida jerichoensis* var. *subspinulifera* within the application area is located along the southern boundary of the application occurring within close proximity of an access track (BHP, 2023). Flora species *Aristida jerichoensis* var. *subspinulifera* contains an established population within the Hamersley subregion, furthermore, several recorded individuals of the priority flora species reside within the Karijini National Park (Western Australian Herbarium, 1998-). Given the existing flora management condition on the clearing permit restricts clearing within 10 meters of the recorded priority flora species, potential environmental impacts to *Aristida jerichoensis* var. *subspinulifera* from the proposed clearing are considered to be adequately minimised, and unlikely to result in a significant loss of the subregional population of *Aristida jerichoensis* var. *subspinulifera*.

*Triodia* sp. *Mt Ella* (P3) exists within a relatively restricted range extension within the Hamersley subregion ranging from Karijini National Park to the application area, whereby the recorded individuals within the application area represent the eastern boundary of the species' range extension (Western Australian Herbarium, 1998-). The recorded individuals of *Triodia* sp. *Mt Ella* within the application area were found along gorges, gullies and minor drainage lines populated by themeda tussock grassland (BHP, 2023). Several individuals of *Triodia* sp. *Mt Ella* have been recorded directly outside the application area along drainage lines supported by the same vegetation associations found within the application area. Given the existing flora management condition on the clearing permit, potential environmental impacts caused by the proposed clearing to *Triodia* sp. *Mt Ella* within the application area are considered to be adequately minimised, and unlikely to result in a significant loss of *Triodia* sp. *Mt Ella* within the local context.

*Isotropis parviflora* (P3) is an erect shrub which responds to good seasons and likely to decline and die off during dry seasons (DBCA, 2022). Surveys conducted within the local context of the application area have concluded *Isotropis parviflora* is a short lived disturbance species that responds to fire and is often recorded along the berms of access tracks (Onshore Environmental, 2015). With exception for the single individual species located near the western boundary of the application area, all recorded species of *Isotropis parviflora* within the application area were found occurring directly along exploration tracks undertaken by the Permit Holder (BHP, 2023). More denser and established populations of *Isotropis parviflora* are located approximately 160 kilometres north west of the application area towards the Karijini National Park (GIS Database). Given landforms on which this species is found are widespread in Karijini National Park (DBCA, 2022), potential environmental impacts caused by the proposed clearing to *Isotropis parviflora* (P3) within the application area are considered to be adequately minimised through the existing flora management condition, and unlikely to result in a significant loss of *Isotropis parviflora* within the local context.

A previous flora survey (Ecologia, 2004) identified one species of *Isotropis winneckeii* (P1) within the application area. This identification was not confirmed by the Western Australian Herbarium, represented a 300 kilometre range extension to the east and failed to be recorded locally during numerous surveys over a 17 year period since the original record (Onshore Environmental, 2019). The Western Australian Herbarium have confirmed the mis-identification of *Isotropis winneckeii* within the initial survey, and re-classified the flora species as *Isotropis parviflora* (P3) (Onshore Environmental, 2019).

### Conclusion

For the reasons set out above, the Permit Holder's request for the removal of conditions 9 (a) and (b)(i) in relation to threatened flora species is found acceptable given the detailed flora and vegetation surveys provided to the Department, furthermore, it is considered that the impacts of the proposed clearing on priority flora species can be managed through an amended flora management condition restricting the Permit Holder from clearing priority flora, and within ten meters of all identified priority flora within the application area.

#### Conditions

To address the above impacts, the following management measures will be required as conditions on the clearing permit:

- Flora management restricting clearing the clearing of priority flora, and within ten meters of identified priority flora.

### 3.2.2. Biological values (fauna) – Clearing principles (a) and (b)

#### Assessment

Eco Logical was commissioned to undertake a Level 1 Vertebrate Fauna Assessment within the wider Ninga Project Area between 10 to 16 May 2013 (Eco Logical, 2013). The survey area covered approximately 3,898 hectares starting approximately seven kilometres west of the application area traveling in an easterly direction for approximately 14 kilometres. Despite fauna assessment completed on approximately 70 per cent of the application area, due to the consistent landscape, geomorphology and associated vegetation communities throughout the application area, the fauna assessment is found sufficient in providing the potential environmental impacts caused by the proposed clearing. A desktop assessment and fauna survey recorded eight conservation significant fauna species within the application area (Eco Logical, 2013; GIS Database).

- brush-tailed mulgara (*Dasyercus blythi*, P4)
- Gane's blind snake (*Anilius ganei*, P1)
- ghost bat (*Macroderma gigas*, VU under EPBC Act and BC Act)
- grey falcon (*Falco hypoleucos*, VU under BC Act)
- orange leaf-nosed bat (*Rhinonictoris aurantia*, P4)
- Pilbara leaf-nosed bat (*Rhinonictoris aurantia* (Pilbara form), VU under EPBC Act and BC Act)
- Pilbara olive python (*Liasis olivaceus barroni*, VU under EPBC Act and BC Act)
- western pebble-mound mouse, ngadji (*Pseudomys chapmani*, P4)

The Permit Holder further commissioned a detailed review of all previous regional fauna habitat mapping (Biologic, 2014) and recorded seven broad habitat types occurring within the application area:

- **Breakaway / Cliff:** Breakaways/Cliffs are rugged, incised rocky hills and ranges. They tend to contain large rock fragments and more rock outcropping than other fauna habitats. Significant habitat features such as caves were sometimes encountered in this habitat type. Vegetation can be dense and complex in areas of soil deposition or sparse and simple where erosion has occurred.
- **Drainage Area / Floodplain:** Characterised by *Eucalyptus xerothermica* and *Corymbia hamersleyana* woodland over broad leaved *Acacia* shrubland on sandy loam soils sometimes with exposed rocky areas. These can have high vegetation density, complexity and diversity, and because they tend to occur on accretional or depositional areas, often have deeper and richer soils than other fauna habitats. Grasses tend to be dominated by tussock grasses rather than spinifex, or the weed Buffel Grass \**Cenchrus ciliaris*.
- **Gorge / Gully:** Gorges and gullies are rugged, steep-sided valleys incised into the surrounding landscape. Gorges tend to be deeply incised, with vertical cliff faces, while gullies are more open (but not as open as Minor Drainage Lines). Caves and rock pools are most often encountered in this habitat type. Vegetation can be dense and complex in areas of soil deposition or sparse and simple where erosion has occurred.
- **Hillcrest / Hill slope:** These fauna habitats tend to be more open and structurally simple due to their recent depositional history than other fauna habitats and are dominated by varying species of spinifex. A common feature of these habitats is a rocky substrate, often with exposed bedrock, and skeletal red soils. These are usually dominated by *Eucalyptus* woodlands, *Acacia* and *Grevillea* scrublands and *Triodia* spp. low hummock grasslands.
- **Minor Drainage Line:** Located within the minor gullies and depressions, generally through the Crest/Slope habitat. Consists primarily of *Acacia* low shrubland. The understorey generally lacks density and often consists solely of sparse tussock grassland, often including the weed Buffel Grass \**Cenchrus ciliaris* where it has been introduced. The substrate can be sandy in places but generally consists of a skeletal loam gravel or stone.
- **Sand Plain:** Sand Plain habitat is characterised by relatively deep sandy soils supporting dense spinifex grasslands and sparse shrubs. This habitat transitions into patches of Mulga in places. This habitat often occurs as terraces along Major Drainage Lines.
- **Stony Plain:** These are erosional surfaces of gently undulating plains, ridges and associated foot slopes. Mainly support hard spinifex (and occasionally soft spinifex) with a mantle of gravel and pebbles.

The application area represents a large continuous tract of fauna habitat that retains high connectivity to the habitats directly adjacent (Biologic, 2014). Current disturbances to all habitat types include damage from drought (poor rainfall in 2018/2019), small amounts of clearing (for tracks, artificial water sources and exploration) as well as grazing from feral animals (donkeys) and native kangaroos. While the structural complex of some habitat types show stress signs of grazing and reduced water availability, the majority of the site is uncleared and represents good, intact habitat (Biologic, 2014).

The brush-tailed mulgara burrows recorded within the application area were found almost exclusively within the sand plain habitat (BHP, 2023). The sand plain habitat is a thin section mapped along the southern border of the application area containing minor drainage lines and ongoing disturbance occurring throughout the length of the habitat (BHP, 2023). Given sand plain habitats are common throughout the Pilbara and the predominant habitat type within the Chichester subregion (Biologic, 2014), larger areas of suitable foraging and breeding habitat for brush-tailed mulgaras can be found outside the application area in the absence of clearing and disturbances activities.

Several western pebble-mound mouse individuals and mounds were recorded within the application area. They were found populating hillcrest and hillslope habitats (BHP, 2023). Similar to the other mapped habitats within the application area, hillcrest and hillslope habitats occur throughout the Pilbara and commonly occur within National Parks within the region such as Karijini National Park (GIS Database). Given the western pebble-mound mouse can cover large distances and roam areas of over 14 hectares at night often visiting other unoccupied mounds (Anstee S., et al, 1997), coupled with the commitment made by the Permit Holder to avoid active mounds of the western pebble-mound mouse using a 10 meter buffer where practicable (BHP, 2023), the potential loss of suitable hillcrest and hillslope habitat within the application area will unlikely cause a significant impact on the local and regional population of the western pebble-mound mouse.

The fauna assessment recorded suitable foraging habitat for the grey falcon within the application area, however, preferable potential breeding habitats for the species was associated with rivers and major creek habitats found surrounding the Fortescue River located approximately five kilometres south-west of the application area (Biologic, 2014; GIS Database). Given the lack of suitable breeding habitat within the application, coupled with the grey falcon's wide distribution and extensive foraging range, it is unlikely that the Grey Falcon is dependent on habitat within the application area (Biologic, 2014).

The Pilbara olive python was recorded within gorge and gully habitats mapped across the application area (BHP, 2023). Suitable habitat for the Pilbara olive python consists of rocky escarpments, gorges, and waterholes (GHD, 2019). The preferred microhabitats for this species are under rock piles, on top of rocks, and under spinifex as well as in man-made features such as overburden heaps, railway embankments and sewerage treatment ponds (GHD, 2019). The waterholes found within the mapped gorge and gully habitats provide the Pilbara olive python suitable foraging and breeding habitat (Eco Logical, 2013) making the species dependent on the habitat found within the application area and therefore, susceptible to any proposed clearing that may impact their respective habitat. To minimise the impact of the proposed clearing on the local population of Pilbara olive python and their respective suitable habitats within the application area, The Permit Holder has removed all water holes including a ten metre buffer from the amended application area. Despite having ambiguous habitat preferences removing these waterhole habitats from the application area will also minimise the impacts of the proposed clearing on the Gane's blind snake due to their broad association with moist gorges and gullies, similar to the Pilbara olive python (GHD, 2019).

The application area contains five caves within the mapped gorge and gulley habitat that were considered suitable roosting habitat for the ghost bat, Pilbara leaf-nosed bat and the orange leaf-nosed bat (BHP, 2023). The fauna assessment noted that in many rocky areas, potential bat caves were extensive along cliffs and breakaways, which could potentially be used by the species' as diurnal roosts or night roosts to extend their foraging excursions (Biologic, 2014). Despite inconclusive field results identifying these fauna species occupying the caves during the survey (Biologic, 2014), a desktop assessment and past surveys record all three species occurring within the application area and local context (GIS Database). Given the Permit Holder has removed all identified caves with a buffer of 50 metres from the amended application area, impacts caused by the proposed clearing towards potential roosting habitats of the ghost bat, Pilbara leaf-nosed bat and the orange leaf-nosed bat within the application area will be significantly minimised. Similarly, due to these species' having a nightly foraging range between 10 to 20 kilometres, broad-scale, patchy, low intensity anthropogenic changes induced by mining projects are unlikely to impact these species significantly (Bat Call WA, 2021a; Bat Call WA, 2021b).

### Conclusion

For the reasons set out above, it is considered that the impacts of the proposed clearing on significant conservation fauna species and their respective habitats can be avoided through the removal of identified water hole and cave habitats from the amended application area as proposed by the Permit Holder.

The applicant may have notification responsibilities under the EPBC Act for impacts to the ghost bat, Pilbara olive python, Pilbara leaf-nosed bat and their habitats, as set out in the EPBC Act. The applicant has been advised to contact the federal Department of Climate Change, Energy, the Environment and Water (DCCEEW) to discuss EPBC Act referral requirements.

### Conditions

To address the above impacts, the following management measures will be required as conditions on the clearing permit:

- Clearing not authorised within 10 meters and 50 meters of waterholes and caves respectively.

## **3.3. Relevant planning instruments and other matters**

The clearing permit amendment application was advertised on 29 September 2023 by the Department of Mines, Industry Regulation and Safety inviting submissions from the public. No submissions were received in relation to this application.

There is one native title claim (WCD2018/008) over the area under application (DPLH, 2023). This claim has been determined by the Federal Court on behalf of the claimant group. However, the Iron Ore (Mount Newman) Agreement Act 1964 has been granted in accordance with the future act regime of the *Native Title Act 1993* and the nature of the act (i.e. the proposed clearing activity) has been provided for in that process, therefore, the granting of a clearing permit is not a future act under the *Native Title Act 1993*.

There is one registered Aboriginal Sites of Significance within the application area (DPLH, 2023). It is the proponent's responsibility to comply with the *Aboriginal Cultural Heritage Act 2021* and ensure that no Aboriginal Sites of Significance are damaged through the clearing process.

Other relevant authorisations required for the proposed land use include:

- A Programme of Work approved under the *Mining Act 1978*.

It is the proponent's responsibility to liaise with the Department of Water and Environmental Regulation and the Department of Biodiversity, Conservation and Attractions, to determine whether a Works Approval, Water Licence, Bed and Banks Permit, or any other licences or approvals are required for the proposed works.

**End**



## Appendix A. Site characteristics

### A.1. Site characteristics

Characteristic	Details
Local context	The area proposed to be cleared is part of an expansive tract of native vegetation in the extensive land use zone of Western Australia. It is surrounded by native vegetation and landscape of the Pilbara bioregion, located approximately 20 kilometres east of Newman.
Ecological linkage	The application area does not form part of any formal ecological linkages (GIS Database).
Conservation areas	No conservation areas are located within a 50 kilometre radius of the application area.
Vegetation description	<p>The vegetation of the application area is broadly mapped as the following Beard vegetation associations:</p> <p>82: Hummock grasslands, low tree steppe; snappy gum over <i>Triodia wiseana</i>; and            216: Low woodland; mulga (with spinifex) on rises (GIS Database).</p> <p>Flora and vegetation surveys were conducted over the application area (Astron, 2013; Onshore Environmental 2014; and Spectrum, 2022) identified a total of 12 broad floristic formations with 34 vegetation associations:</p> <p>*Cenchrus Open Tussock Grassland</p> <ul style="list-style-type: none"> <li>- 4b: Open Woodland of <i>Eucalyptus victrix</i> over Tall Shrubland of <i>Petalostylis labicheoides</i>, <i>Androcalva luteiflora</i>, <i>Acacia bivenosa</i>, <i>A. pyrifolia</i> and <i>A. citrinoviridis</i> over Tussock Grassland of *<i>Cenchrus ciliaris</i>, <i>Themeda triandra</i> and <i>Eriachne mucronate</i>;</li> <li>- 4c: Low Open Woodland of <i>Corymbia hamersleyana</i> and <i>Acacia citrinoviridis</i> over Tall Open Shrubland of <i>Petalostylis labicheoides</i>, <i>Santalum lanceolatum</i> and <i>Grevillea wickhamii</i> over Tussock Grassland of *<i>Cenchrus ciliaris</i>, <i>Enneapogon robustissimus</i> and <i>Eriachne mucronata</i> and Open Hummock Grassland of <i>Triodia epactia</i>;</li> </ul> <p>*Cenchrus Tussock Grassland</p> <ul style="list-style-type: none"> <li>- MA CcTtEua ChCa AbAtpAss: Tussock Grassland of *<i>Cenchrus ciliaris</i>, <i>Themeda triandra</i> and <i>Eulalia aurea</i> with Low Open Woodland of <i>Corymbia hamersleyana</i> and <i>Corymbia aspera</i> over High Open Shrubland of <i>Acacia bivenosa</i>, <i>Acacia tumida</i> var. <i>pilbarensis</i> and <i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i> on brown loamy sand on levee banks of major drainage lines;</li> </ul> <p>Acacia Low Open Woodland</p> <ul style="list-style-type: none"> <li>- FP AaAciApr AsyAssAb Tp: Low Open Woodland of <i>Acacia aptaneura</i>, <i>Acacia citrinoviridis</i> and <i>Acacia pruinocarpa</i> over Open Shrubland of <i>Acacia synchronicia</i>, <i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i> and <i>Acacia bivenosa</i> over Very Open Hummock Grassland of <i>Triodia pungens</i> on red brown clay loam on floodplains and medium drainage lines;</li> </ul> <p>Acacia Open Scrub</p> <ul style="list-style-type: none"> <li>- MI AtpPIAm TpTs ChEII: Open Scrub of <i>Acacia tumida</i> var. <i>pilbarensis</i>, <i>Petalostylis labicheoides</i> and <i>Acacia monticola</i> over Open Hummock Grassland of <i>Triodia pungens</i> and <i>Triodia</i> sp. <i>Shovelanna Hill</i> (S.van Leeuwen 3835) with Low Open Woodland of <i>Corymbia hamersleyana</i> and <i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i> on red brown sandy loam on minor drainage lines;</li> </ul> <p>Acacia Open Shrubland</p> <ul style="list-style-type: none"> <li>- HS ArEre Apr TsTw: Open Shrubland of <i>Acacia rhodophloia</i> and <i>Eremophila exilifolia</i> with High Open Shrubland of <i>Acacia pruinocarpa</i> over Open Hummock Grassland of <i>Triodia</i> sp. <i>Shovelanna Hill</i> (S. van Leeuwen 3835) and <i>Triodia wiseana</i> on red brown clay loam on stony lower hill slopes;</li> </ul> <p>Acacia Shrubland</p> <ul style="list-style-type: none"> <li>- 5a: Open Woodland of <i>Corymbia hamersleyana</i> and <i>Eucalyptus gamophylla</i> over Tall Shrubland of <i>Acacia monticola</i>, <i>Petalostylis labicheoides</i> and <i>Santalum lanceolatum</i> and <i>A. bivenosa</i> over Hummock Grassland of <i>Triodia epactia</i> and <i>T. basedowii</i> and Open Tussock Grassland of <i>Themeda triandra</i> which occurs as a mosaic with vegetation association 11a;</li> <li>- MI AmAancPI ChEII TtAri: Shrubland of <i>Acacia monticola</i>, <i>Acacia ancistrocarpa</i> and <i>Petalostylis labicheoides</i> with Scattered Low Trees of <i>Corymbia hamersleyana</i> and <i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i> over Open Tussock Grassland of <i>Themeda triandra</i> and <i>Aristida inaequiglumis</i> on red loamy sand on minor drainage lines;</li> </ul> <p>Acacia Tall Open Scrub</p> <ul style="list-style-type: none"> <li>- 11b: This is a mosaic of two vegetation associations: 11a :Tall scrub of <i>Acacia ancistrocarpa</i>, <i>A. dictyophleba</i>, <i>Grevillea wickhamii</i> and <i>A. inaequilatera</i> over Open Hummock Grassland of <i>Triodia basedowii</i>, and <i>T. sp. Shovelanna Hill</i> (S. van Leeuwen</li> </ul>

Characteristic	Details
	<p>3835) and Very Open Tussock Grassland of <i>Paraneurachne muelleri</i> which occurs as a mosaic with vegetation association 5a.5a: Open Woodland of <i>Corymbia hamersleyana</i> and <i>Eucalyptus gamophylla</i> over Tall Shrubland of <i>Acacia monticola</i>, <i>Petalostylis labicheoides</i> and <i>Santalum lanceolatum</i> and <i>A. bivenosa</i> over Hummock Grassland of <i>Triodia epactia</i> and <i>T. basedowii</i> and Open Tussock Grassland of <i>Themeda triandra</i>;</p> <p>Acacia Tall Shrubland</p> <ul style="list-style-type: none"> <li>- 2a: Tall Open Shrubland to Tall Shrubland of <i>Acacia pruinocarpa</i>, <i>A. aptaneura</i> and <i>A. catenulata</i> subsp. <i>occidentalis</i> over Shrubland of <i>A. aptaneura</i>, <i>A. aneura</i>, <i>A. bivenosa</i> and <i>Eremophila forrestii</i> subsp. <i>forrestii</i> over Scattered Low Shrubs of <i>Scaevola parvifolia</i> subsp. <i>pilbarae</i> over Open Hummock Grassland of <i>Triodia basedowii</i> and Very Open Tussock Grasses of <i>Aristida contorta</i>, <i>Paraneurachne muelleri</i> and <i>Cymbopogon procerus</i>;</li> </ul> <p>Amphipogon Open Tussock Grassland</p> <ul style="list-style-type: none"> <li>- 9a: Scattered Low Trees of <i>Corymbia deserticola</i> over Open Tussock Grassland of <i>Amphipogon sericeus</i>, <i>Paraneurachne muelleri</i> and Very Open Hummock Grassland of <i>Triodia basedowii</i>;</li> </ul> <p>Themeda Tussock Grassland</p> <ul style="list-style-type: none"> <li>- 10b: Open Woodland of <i>Eucalyptus kingsmillii</i> subsp. <i>kingsmillii</i> and <i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i> over Tall Open Scrub of <i>Acacia monticola</i>, <i>Santalum lanceolatum</i> and <i>Androcalva luteiflora</i> over Tussock Grassland of <i>Themeda triandra</i> and <i>Eulalia aurea</i> and Open Hummock Grassland of <i>Triodia epactia</i>;</li> <li>- GG TtErmuThmb EIlChCf AtpGoroPl: Tussock Grassland of <i>Themeda triandra</i>, <i>Eriachne mucronata</i> and <i>Themeda</i> sp. <i>Mt Barricade</i> with Low Open Woodland of <i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>, <i>Corymbia hamersleyana</i> and <i>Corymbia ferritcola</i> over High Shrubland of <i>Acacia tumida</i> var. <i>pilbarensis</i>, <i>Gossypium robinsonii</i> and <i>Petalostylis labicheoides</i> on red brown sandy loam on narrowly incised rocky drainage lines;</li> <li>- MI TtCyoErmu ChEg GrwhPIErti: Tussock Grassland of <i>Themeda triandra</i>, <i>Cymbopogon obtectus</i> and <i>Eriachne mucronata</i> with Open Woodland of <i>Corymbia hamersleyana</i> and <i>Eucalyptus gamophylla</i> over High Open Shrubland of <i>Grevillea wickhamii</i> subsp. <i>hispidula</i>, <i>Petalostylis labicheoides</i> and <i>Eremophila tietkensis</i> on red loamy sand on minor drainage lines;</li> </ul> <p>Triodia Hummock Grassland</p> <ul style="list-style-type: none"> <li>- FP Tb AaApr Erff: Hummock Grassland of <i>Triodia basedowii</i> with Low Open Woodland of <i>Acacia aptaneura</i> and <i>Acacia pruinocarpa</i> over Open Shrubland of <i>Eremophila forrestii</i> subsp. <i>forrestii</i> on red sandy loam on floodplains;</li> <li>- FP Tp EtEg AbAancPl: Hummock Grassland of <i>Triodia pungens</i> with Very Open Mallee of <i>Eucalyptus trivalva</i> and <i>Eucalyptus gamophylla</i> over Shrubland of <i>Acacia bivenosa</i>, <i>Acacia ancistrocarpa</i> and <i>Petalostylis labicheoides</i> on red brown loam on unincised drainage tracts on floodplains;</li> <li>- FS Ts CdHc AancAiGrwh: Hummock Grassland of <i>Triodia</i> sp. <i>Shovelanna Hill</i> (S. van Leeuwen 3835) with Low Open Woodland of <i>Corymbia deserticola</i> subsp. <i>deserticola</i> and <i>Hakea chordophylla</i> over Open Shrubland of <i>Acacia ancistrocarpa</i>, <i>Acacia inaequilatera</i> and <i>Grevillea wickhamii</i> subsp. <i>hispidula</i> on red brown sandy loam on footslopes and stony plains;</li> <li>- GG Tp EIlCf Dop: Hummock Grassland of <i>Triodia pungens</i> with Low Woodland of <i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i> and <i>Corymbia ferritcola</i> over Open Shrubland of <i>Dodonaea pachyneura</i> on red brown sandy clay loam in gullies;</li> <li>- HC TsTp EkkEg: Hummock Grassland of <i>Triodia wiseana</i> with Shrubland of <i>Acacia hamersleyensis</i> and Open Mallee of <i>Eucalyptus kingsmillii</i> subsp. <i>kingsmillii</i>, <i>Eucalyptus gamophylla</i> and <i>Corymbia hamersleyana</i> (mallee form) on red brown loam and silty loam on hill crests;</li> <li>- HC Tw Ah EkkEgCh: Hummock Grassland of <i>Triodia wiseana</i> with Shrubland of <i>Acacia hamersleyensis</i> and Open Mallee of <i>Eucalyptus kingsmillii</i> subsp. <i>kingsmillii</i>, <i>Eucalyptus gamophylla</i> and <i>Corymbia hamersleyana</i> (mallee form) on red brown loam and silty loam on hill crests;</li> <li>- HC TwTsTp EIlCh Ah: Hummock Grassland of <i>Triodia wiseana</i>, <i>Triodia</i> sp. <i>Shovelanna Hill</i> (S. van Leeuwen 3835) and <i>Triodia pungens</i> with Low Open Woodland of <i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i> and <i>Corymbia hamersleyana</i> over Open Shrubland of <i>Acacia hamersleyensis</i> on red brown clay loam on hill crests and upper hill slopes;</li> <li>- HS TpTb EIlCh ErmuErlaAh: Hummock Grassland of <i>Triodia pungens</i> and <i>Triodia basedowii</i> with Low Open Woodland of <i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i> and <i>Corymbia hamersleyana</i> over Open Tussock Grassland of <i>Eriachne mucronata</i>, <i>Eriachne lanata</i> and <i>Aristida holathera</i> subsp. <i>holathera</i> on red sandy loam on hill slopes;</li> <li>- HS TpTs CdEIl AancAbAten: Hummock Grassland of <i>Triodia pungens</i> and <i>Triodia</i> sp. <i>Shovelanna Hill</i> (S. van Leeuwen 3835) with Low Open Woodland of <i>Corymbia</i></li> </ul>

Characteristic	Details
	<p><i>deserticola</i> subsp. <i>deserticola</i> and <i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i> over Open Shrubland of <i>Acacia ancistrocarpa</i>, <i>Acacia bivenosa</i> and <i>Acacia tenuissima</i> on red loamy sand on lower hill slopes and footslopes;</p> <ul style="list-style-type: none"> <li>- HS Ts: Hummock Grassland of <i>Triodia</i> sp. <i>Shovelanna Hill</i> (S. van Leeuwen 3835) on red brown sandy loam on hill slopes;</li> <li>- HS TsTwTp EllCh AhiAaa: Hummock Grassland of <i>Triodia</i> sp. <i>Shovelanna Hill</i> (S. van Leeuwen 3835), <i>Triodia wiseana</i> and <i>Triodia pungens</i> with Low Open Woodland of <i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i> and <i>Corymbia hamersleyana</i> over Low Open Shrubland of <i>Acacia hilliana</i> and <i>Acacia adoxa</i> var. <i>adoxo</i> on red brown sandy loam on hill slopes;</li> <li>- HS Tw EllChHc AancAbAa: Hummock Grassland of <i>Triodia wiseana</i> with Low Open Woodland of <i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>, <i>Corymbia hamersleyana</i> and <i>Hakea chordophylla</i> and Open Shrubland of <i>Acacia ancistrocarpa</i>, <i>Acacia bivenosa</i> and <i>Acacia aptaneura</i> on red sandy loam on hill slopes;</li> <li>- HS TwTs HcAbGrwh AptAhi: Hummock Grassland of <i>Triodia wiseana</i> and <i>Triodia</i> sp. <i>Shovelanna Hill</i> (S. van Leeuwen 3835) with Open Shrubland of <i>Hakea chordophylla</i>, <i>Acacia bivenosa</i> and <i>Grevillea wickhamii</i> subsp. <i>hispidula</i> over Low Open Shrubland of <i>Acacia Ptychophylla</i> and <i>Acacia hilliana</i> on red brown sandy loam on upper hill slopes and hill crests;</li> <li>- MI TsTp AancAmGrwh: Hummock Grassland of <i>Triodia</i> sp. <i>Shovelanna Hill</i> (S. van Leeuwen 3835) and <i>Triodia pungens</i> with Shrubland of <i>Acacia ancistrocarpa</i>, <i>Acacia monticola</i> and <i>Grevillea wickhamii</i> subsp. <i>hispidula</i> on brown sandy loam on minor drainage lines;</li> <li>- SP TpTb Eg PIAbAanc: Hummock Grassland of <i>Triodia pungens</i> and <i>Triodia basedowii</i> with Open Mallee of <i>Eucalyptus gamophylla</i> and Shrubland of <i>Petalostylis labicheoides</i>, <i>Acacia bivenosa</i> and <i>Acacia ancistrocarpa</i> on red brown loamy sand on stony plains and footslopes;</li> </ul> <p>Triodia Open Hummock Grassland</p> <ul style="list-style-type: none"> <li>- 7b: Tall Open Shrubland of <i>Acacia inaequilatera</i> over Scattered Shrubs of <i>Senna glutinosa</i> subsp. <i>pruinosa</i> over Open Hummock Grassland of <i>Triodia epactia</i>;</li> <li>- 7c: Low Open Woodland of <i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i> over Tall Open Shrubland of <i>Hakea chordophylla</i> and <i>Acacia pruinocarpa</i> over Low Shrubland of <i>A. hilliana</i>, <i>A. adoxa</i> var. <i>adoxo</i>, <i>Calytrix carinata</i> and <i>Keraudrenia velutina</i> subsp. <i>elliptica</i> over Open Hummock Grassland of <i>Triodia basedowii</i>, <i>T. sp. Shovelanna Hill</i> (S. van Leeuwen 3835), <i>T. epactia</i> and Very Open Tussock Grasses of <i>Eriachne lanata</i>;</li> <li>- GG Tp CfFibAcao DopAh: Open Hummock Grassland of <i>Triodia pungens</i> with Low Open Woodland of <i>Corymbia ferritcola</i>, <i>Ficus brachypoda</i> and <i>Acacia catenulata</i> subsp. <i>occidentalis</i> over High Open Shrubland of <i>Dodonaea pachyneura</i> and <i>Acacia hamersleyensis</i> on red sandy clay loam in gullies and on breakaway slopes;</li> <li>- HS TpTb EllAaAcao SesSeglErcu: Open Hummock Grassland of <i>Triodia pungens</i> and <i>Triodia basedowii</i> with Low Open Woodland of <i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>, <i>Acacia aptaneura</i> and <i>Acacia catenulata</i> subsp. <i>occidentalis</i> over Open Shrubland of <i>Senna stricta</i>, <i>Senna glutinosa</i> subsp. <i>x luerssenii</i> and <i>Eremophila cuneifolia</i> on orange sandy loam on hill slopes;</li> <li>- ME TscTs Ch AadsErloAanc: Open Hummock Grassland of <i>Triodia schinzii</i> and <i>Triodia</i> sp. <i>Shovelanna Hill</i> (S. van Leeuwen 3835) with Scattered Low Trees of <i>Corymbia hamersleyana</i> over Open Shrubland of <i>Acacia adsurgens</i>, <i>Eremophila longifolia</i> and <i>Acacia ancistrocarpa</i> on red sandy loam on medium drainage lines.</li> </ul> <p>*denotes weed species.</p>
Vegetation condition	<p>The vegetation survey conducted by Astron (2013) indicate the vegetation within the proposed clearing area is in excellent to degraded (Keighery, 1994) condition.</p> <p>The full Keighery (1994) condition rating scale is provided in Appendix C.</p>
Climate and landform	<p>The application area is located in the Hamersley subregion of the Pilbara bioregion described as an arid-tropical climate (Astron, 2013) with an annual average rainfall of 316.7 millimetres (Newman Aero) (BoM, 2023).</p> <p>The application area is located at the eastern end of the Ophthalmia Range, which is dominated by the Brockman Iron Formation and composed of chert, ferruginous chert and minor shale bands (Astron, 2013).</p>
Soil description	<p>The soil within the application area is mapped as soil unit Fa13 (GIS Database). This soil unit is described as ranges of banded jaspilite and chert along with shales, dolomites, and iron ore formations; some areas of ferruginous duricrust as well as occasional narrow winding valley plains and steeply dissected pediments. This unit is largely associated with the Hamersley and Ophthalmia Ranges. The soils are frequently stony and shallow and there are extensive areas without soil cover (Northcote et al., 1960-68).</p>

Characteristic	Details
Land degradation risk	The application area has been mapped as occurring on the Boolgeeda and Newman land systems (GIS Database). <ul style="list-style-type: none"> <li>- Boolgeeda land system: Stony lower slopes and plains below hill systems supporting hard and soft spinifex grasslands or mulga shrublands; and</li> <li>- Newman land system: Rugged jaspilite plateaux, ridges and mountains supporting hard spinifex grasslands (Van Vreeswyk et al., 2004).</li> </ul>
Waterbodies	No permanent watercourses or wetlands lie within the application area (GIS Database), however, the desktop assessment and aerial imagery indicated multiple minor non-perennial drainage lines intersecting the application area (GIS Database). <p>Approximately 34 kilometres north east of the application area lies a wetland subject to non-perennial inundation (GIS Database). Extending from the wetland, several major non-perennial watercourses travel in a slight south westerly direction towards the local vicinity of the application area.</p> <p>One of these watercourses connects to the Ophthalmia Dam located approximately five kilometres south west of the application area (GIS Database) which further drains into the Savory Creek Wild River located approximately 34 kilometres south of the application area (GIS Database).</p>
Hydrogeography	The application area falls within the Pilbara Groundwater area which is legislated by the RIWI Act 1914. Furthermore, majority of the application area lies within the Newman Water Reserve (P1) Public Drinking Water Source Area containing multiple Wellhead Protection Zones, the closest located approximately seven kilometres west of the application area (GIS Database). <p>The mapped salinity within the application area varies from 500 – 1000 milligrams per litre total dissolved solids which is described as marginal water quality (GIS Database).</p>
Flora	The flora survey undertaken by Astron (2013) identified a total of 227 plant species. No threatened or priority flora species were recorded within the application area (Astron, 2013; GIS Database) <p>Based on previous surveys, three priority species were recorded within the application area; <i>Isotropis parviflora</i> (P3), <i>Aristida jerichoensis</i> var. <i>subspinulifera</i> (P3) and <i>Gymnanthera cunninghamii</i> (P3) (Astron, 2013).</p>
Ecological communities	The closest record of a Threatened Ecological Community (TEC) is the Ethel Gorge aquifer stygobiont community (CR) located approximately six kilometres west of the application area (GIS Database). <p>The vegetation of sand dunes of the Hamersley Range/Fortescue Valley (P3) Priority Ecological Community (PEC) is located approximately 38 kilometres north west of the application area (GIS Database).</p>
Fauna	The fauna assessment conducted by Eco Logical (2013) identified a total of 75 fauna species (one amphibian, 41 birds, 16 reptiles and 17 mammals). A total of eight conservation significant fauna species was recorded within the application area (Eco Logical, 2013; GIS Database). <p>Based on suitable habitat and historical records, an additional 13 conservation significant fauna species were considered likely to occur within the application area (Eco Logical, 2013).</p>

## A.2. Vegetation extent

	Pre-European area (ha)	Current extent (ha)	Extent Remaining %	Current extent in all DBCA managed land (ha)	Current proportion (%) of pre-European extent in all DBCA Managed Lands
IBRA Bioregion Pilbara	17,808,657.04	17,731,764.88	99.57	10.12	10.48
Beard vegetation associations - Western Australia					
Veg Assoc No. 82	2,565,901.28	2,553,206.19	99.51	295,377.96	11.51
Veg Assoc No. 216	280,759.39	279,237.06	99.46	0	0
Beard vegetation associations - Pilbara					

Veg Assoc No. 82	2,563,583.23	2,550,888.14	99.50	11.52	11.52
Veg Assoc No. 216	26,669.89	26,372.58	98.89	0	0

Government of Western Australia (2019)

### A.3. Flora analysis table

With consideration for the site characteristics set out above, relevant datasets (see Appendix D.1), and biological survey information (Astron, 2013; Spectrum, 2022) the following conservation significant flora have been found within a 50 kilometre radius of the application area.

Species name	WA Conservation status	Suitable vegetation? [Y/N]	Distance of closest record to application area (km)	Number of known records (total)
<i>Acacia subtiliformis</i>	P3	N	43	24
<i>Amaranthus centralis</i>	P3	Y	27	7
<i>Aristida jerichoensis</i> var. <i>subspinulifera</i>	P3	Y	0	45
<i>Eremophila capricornica</i>	P1	N	40	20
<i>Eremophila pilosa</i>	P1	Y	50	9
<i>Goodenia hartiana</i>	P2	Y	6	24
<i>Goodenia</i> sp. <i>East Pilbara</i> (A.A. Mitchell PRP 727)	P3	Y	43	53
<i>Gymnanthera cunninghamii</i>	P3	Y	8	40
<i>Lepidium catapycnon</i>	P4	Y	29	39
<i>Isotropis parviflora</i>	P3	Y	0	33
<i>Rhagodia</i> sp. <i>Hamersley</i>	P3	N	3	75
<i>Sida</i> sp. <i>Barlee Range</i> (S. van Leeuwen 1642)	P4	Y	48	58
<i>Triodia</i> sp. <i>Mt Ella</i>	P3	Y	0	40
<i>Vittadinia</i> sp. <i>Coondewanna Flats</i> (S. van Leeuwen 4684)	P3	N	7	26

T: threatened, CR: critically endangered, EN: endangered, VU: vulnerable, P: priority

### A.4. Fauna analysis table

With consideration for the site characteristics set out above, relevant datasets (see Appendix D.1), and biological survey information (Eco Logical, 2013; GIS Database) the following conservation significant fauna have been assessed and found to potentially occur within the application area.

Species name	Common Name	WA status	EPBC status	Distance of closest record to application area (km)
Reptiles				
<i>Anilius ganei</i>	Gane's blind snake (Pilbara)	P1	-	0
<i>Liasis olivaceus barroni</i>	Pilbara olive python	VU	VU	0
Birds				
<i>Actitis hypoleucos</i>	common sandpiper	MI	MI	6
<i>Apus pacificus</i>	fork-tailed swift	MI	MI	6
<i>Calidris acuminata</i>	sharp-tailed sandpiper	MI	MI	6
<i>Calidris ferruginea</i>	curlew sandpiper	CR	CR & MI	6
<i>Calidris ruficollis</i>	red-necked stint	MI	MI	6
<i>Calidris subminuta</i>	long-toed stint	MI	MI	6
<i>Charadrius veredus</i>	oriental plover	MI	MI	21
<i>Falco hypoleucos</i>	grey falcon	VU	-	0
<i>Falco peregrinus</i>	peregrine falcon	OS	-	14

Species name	Common Name	WA status	EPBC status	Distance of closest record to application area (km)
<i>Plegadis falcinellus</i>	glossy ibis	MI	MI	6
<i>Tringa glareola</i>	wood sandpiper	MI	MI	6
<i>Tringa nebularia</i>	common greenshank	MI	MI	6
<i>Tringa stagnatilis</i>	marsh sandpiper	MI	MI	6
Mammals				
<i>Dasycercus blythi</i>	brush-tailed mulgara	P4	-	0
<i>Macroderma gigas</i>	ghost bat	VU	VU	0
<i>Pseudomys chapmani</i>	western pebble-mound mouse, ngadji	P4	-	0
<i>Rhinonictes aurantia</i>	orange leaf-nosed bat	P4	-	0
<i>Rhinonictes aurantia</i> (Pilbara form)	Pilbara leaf-nosed bat	VU	VU	0
<i>Sminthopsis longicaudata</i>	long-tailed dunnart	P4	-	29

T: threatened, CR: critically endangered, EN: endangered, VU: vulnerable, P: priority

#### A.5. Ecological community analysis table

Community name	Reason for Conservation	Conservation status	Suitable habitat features? [Y/N]	Distance of closest record to application area (km)
Ethel Gorge aquifer stygobiont community	Comprises a diverse assemblage of stygofaunal species. It includes Oligochaeta, crustaceans and one new genus of Crangonyctoid amphipoda, in which 14 species (13 in this aquifer) have been described on morphological characters. At least one species of Chydaekata is known only from this community.	CR	N/A	6
Vegetation of sand dunes of the Hamersley Range/Fortescue Valley	Red linear iron-rich sand dunes vegetated with <i>Acacia dictyophleba</i> scattered tall shrubs over <i>Crotalaria cunninghamii</i> , <i>Trichodesma zeylanicum</i> var. <i>grandiflorum</i> open shrubland. They are regionally rare, small and fragile and highly susceptible to threatening processes.	P3	N	38

T: threatened, CR: critically endangered, EN: endangered, VU: vulnerable, P: priority

**Appendix B. Assessment against the clearing principles**

Assessment against the clearing principles	Variance level	Is further consideration required?
<b>Environmental value: biological values</b>		
<p><u>Principle (a):</u> <i>“Native vegetation should not be cleared if it comprises a high level of biodiversity.”</i></p> <p><u>Assessment:</u></p> <p>Seven conservation significant fauna and three conservation significant flora was recorded within the application area (Eco Logical, 2013; GIS Database). Based on the broad fauna habitats recorded within the biological survey, eight conservation significant fauna species were recorded within the application area (Eco Logical, 2013; GIS Database), and an additional 13 conservation significant fauna species are considered likely to occur within the application area.</p>	<p>May be at variance</p> <p>Changed from CPS 2160/3</p>	<p>Yes</p> <p><i>Refer to Section 3.2.1, above.</i></p>
<p><u>Principle (b):</u> <i>“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.”</i></p> <p><u>Assessment:</u></p> <p>The Permit Holder undertook a detailed review of all previous fauna surveys (Biologic, 2014) and recorded seven broad habitat types occurring within the application area:</p> <ol style="list-style-type: none"> <li>1. Breakaway / Cliff;</li> <li>2. Drainage area / Floodplain;</li> <li>3. Gorge / Gully;</li> <li>4. Hillcrest / Hillslope;</li> <li>5. Minor drainage line;</li> <li>6. Sand plain; and</li> <li>7. Stony plain (BHP, 2023).</li> </ol> <p>The permit holder has provided avoidance measures and made a reasonable effort to avoid and minimise potential impacts of the proposed clearing on significant habitat for fauna.</p>	<p>May be at variance</p> <p>Changed from CPS 2160/3</p>	<p>Yes</p> <p><i>Refer to Section 3.2.2, above.</i></p>
<p><u>Principle (c):</u> <i>“Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora.”</i></p> <p><u>Assessment:</u></p> <p>There are no known records of Threatened flora within a 50 kilometre radius of the application area (GIS Database). A flora survey of the application area did not record any species of Threatened flora (Astron, 2013; Spectrum, 2022).</p>	<p>Not likely to be at variance</p> <p>Changed from CPS 2160/3</p>	<p>Yes</p> <p><i>Refer to Section 3.2.1, above.</i></p>
<p><u>Principle (d):</u> <i>“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.”</i></p> <p><u>Assessment:</u></p> <p>There are no known Threatened Ecological Communities (TECs) located within the application area (GIS Database). The closest TEC which has been further classified as an Environmentally Sensitive Area (ESA) is the Ethel Gorge aquifer stygobiont community. Given this TEC is located approximately six kilometres west of the application area (GIS Database) and the diverse assemblage of stygofaunal species found within the Ethel Gorge aquifer TEC is reliant on the maintenance of Ophthalmia aquifer habitat (DBCA, 2023), the proposed clearing is unlikely necessary for the maintenance of the Ethel Gorge aquifer stygobiont community TEC.</p>	<p>Not likely to be at variance</p> <p>As per CPS 2160/3</p>	<p>No</p>
<b>Environmental value: significant remnant vegetation and conservation areas</b>		
<p><u>Principle (e):</u> <i>“Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.”</i></p> <p><u>Assessment:</u></p> <p>The application area falls within the Pilbara Bioregion of the Interim Biogeographic Regionalisation for Australia (IBRA) (GIS Database). Approximately 99% of the pre-European vegetation still exists in the IBRA Pilbara Bioregion (Government of Western Australia, 2019).</p> <p>The application area is broadly mapped as Beard vegetation associations 82 and 216 (GIS Database). These vegetation associations have not been extensively cleared as</p>	<p>Not at variance</p> <p>As per CPS 2160/3</p>	<p>No</p>

Assessment against the clearing principles	Variance level	Is further consideration required?
<p>over 98% of the pre-European extent of these vegetation association remain uncleared at a state and bioregional level (Government of Western Australia, 2019).</p>		
<p><u>Principle (h):</u> <i>“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.”</i></p> <p><u>Assessment:</u></p> <p>No conservation areas are located within a 50 kilometre radius of the application area. The closest conservation area is the Collier National Park, located approximately 125 kilometres south west of the application area.</p>	<p>Not likely to be at variance</p> <p>As per CPS 2160/3</p>	<p>No</p>
<p><b>Environmental value: land and water resources</b></p>		
<p><u>Principle (f):</u> <i>“Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.”</i></p> <p><u>Assessment:</u></p> <p>There are no wetlands or permanent watercourses within the application area, however, multiple minor non-perennial drainage lines run through the application area in a southerly direction feeding into Shovelanna Creek (GIS Database). The permit holder has made an internal commitment to where practical, use existing cleared tracks to cross drainage lines and if new crossings are necessary clearing will be kept to a bare minimum and will be constructed flat level to the surface (i.e. a simple clearing with no bunds) to maintain the natural surface flow (BHP, 2023).</p> <p>In accordance with the permit holder’s commitment, loss of riparian vegetation caused by the proposed clearing can be minimised through the implementation of a riparian vegetation and watercourse management condition.</p>	<p>At variance</p> <p>As per CPS 2160/3</p>	<p>No</p>
<p><u>Principle (g):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.”</i></p> <p><u>Assessment:</u></p> <p>The application area has been mapped as occurring on the Boolgeeda and Newman land systems (GIS Database). Landforms found within the Newman land system including; ridges, mountains, hills, lower slopes, stony plains and narrow drainage floors with channels all contain mantles with an abundance of; pebbles, cobbles, and stones of ironstone, jaspelite, chert and other rocks (Van Vreeswyk et al., 2004). Due to the abundance of stony soils throughout the Newman land system, this land system is not likely prone to erosion.</p> <p>The Boolgeeda land system consists predominantly of depositional surfaces; stony slopes and plains, hill systems and closely spaced, dendritic, sub-parallel drainage lines (Van Vreeswyk et al., 2004). Due to the depositional nature of the soil surfaces, loss of stabilising vegetation may potentially cause wind and water erosion.</p> <p>Given the proposed clearing activities consist of; mineral exploration, hydrological investigations, geotechnical investigations, weather masts, supporting infrastructure and associated activities, the clearing undertaken will predominantly consist of drilling and access tracks subject to revegetation and rehabilitation within 12 months upon completion of works.</p> <p>With consideration to the nature of the proposed clearing activities within the application area, coupled with the existing revegetation and rehabilitation condition placed on the clearing permit, potential land degradation caused by the proposed clearing can be adequately managed and will not constitute a significant residual impact.</p>	<p>May be at variance</p> <p>Changed from CPS 2160/3</p>	<p>No</p>
<p><u>Principle (i):</u> <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.”</i></p> <p><u>Assessment:</u></p> <p>The application area is located within the Newman Water Reserve (P1) Public Drinking Water Source (GIS Database). The Newman Water Reserve contains multiple Wellhead Protection Zones, the closest located approximately seven kilometres east of the application area (GIS Database). To reduce the potential contamination risks of mining operations and urban activities, BHP Billiton has commissioned the Homestead bore fields located approximately 19 kilometres west of the application area as an alternative location for public drinking water supply bores</p>	<p>May be at variance</p> <p>Changed from CPS 2160/3</p>	<p>No</p>



Assessment against the clearing principles	Variance level	Is further consideration required?
<p>remote from existing or future mining and upstream of the town (Government of Western Australia, 2014).</p> <p>The application area also contains the Hamersley – Fractured Rock Aquifer containing generally fresh groundwater within these rocks deep below the surface (BHP, 2023). Any groundwater abstraction within this area will require a Water Licence from the Department of Water (DoW, 2007). The Department of Water has advised that the proposed clearing is unlikely to have any significant impact on groundwater levels or quality (DoW, 2007).</p>		
<p><u>Principle (j):</u> “Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.”</p> <p><u>Assessment:</u></p> <p>No permanent watercourses or wetlands are recorded within the application area and the average annual evaporation (3,200 to 3,600 millimetres) (BoM, 2023) is higher than the average annual rainfall (316.7 millimetres) (BoM, 2023). Coupled with the nature of activities undertaken within the application area, the proposed clearing will unlikely cause excessive levels of water runoff that would exacerbate the incidence or intensity of flooding in the local area.</p>	<p>Not likely to be at variance</p> <p>As per CPS 2160/3</p>	No

### Appendix C. Vegetation condition rating scale

Vegetation condition is a rating given to a defined area of vegetation to categorise and rank disturbance related to human activities. The rating refers to the degree of change in the vegetation structure, density and species present in relation to undisturbed vegetation of the same type. The degree of disturbance impacts upon the vegetation's ability to regenerate. Disturbance at a site can be a cumulative effect from a number of interacting disturbance types.

Considering its location, the scale below was used to measure the condition of the vegetation proposed to be cleared. This scale has been extracted from Keighery, B.J. (1994) *Bushland Plant Survey: A Guide to Plant Community Survey for the Community*. Wildflower Society of WA (Inc). Nedlands, Western Australia.

#### Measuring vegetation condition for the South West and Interzone Botanical Province (Keighery, 1994)

Condition	Description
Pristine	Pristine or nearly so, no obvious signs of disturbance.
Excellent	Vegetation structure intact, with disturbance affecting individual species; weeds are non-aggressive species.
Very good	Vegetation structure altered, with obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and/or grazing.
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and/or grazing.
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and/or grazing.
Completely degraded	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees or shrubs.

### Appendix D. Sources of information

#### D.1. GIS databases

Publicly available GIS Databases used (sourced from [www.data.wa.gov.au](http://www.data.wa.gov.au)):

- Aboriginal Heritage Places (DPLH-001)
- Clearing Regulations – Schedule One Areas (DWER-057)
- DBCA – Lands of Interest (DBCA-012)
- DBCA Legislated Lands and Waters (DBCA-011)
- Directory of Important Wetlands in Australia – Western Australia (DBCA-045)
- Environmentally Sensitive Areas (DWER-046)

- Groundwater Salinity Statewide (DWER-026)
- Hydrographic Catchments – Catchments (DWER-028)
- Hydrography – Inland Waters – Waterlines
- Hydrography, Linear (DWER-031)
- IBRA Vegetation Statistics
- Native Title (ILUA) (LGATE-067)
- Pre-European Vegetation Statistics
- Regional Parks (DBCA-026)
- RIWI Act, Groundwater Areas (DWER-034)
- RIWI Act, Surface Water Areas and Irrigation Districts (DWER-037)
- Soil Landscape Mapping – Best Available (DPIRD-027)
- Soil Landscape Mapping – Rangelands (DPIRD-064)
- WA Now Aerial Imagery

Restricted GIS Databases used:

- Threatened Flora (TPFL)
- Threatened Flora (WAHerb)
- Threatened Fauna
- Threatened Ecological Communities and Priority Ecological Communities
- Threatened Ecological Communities and Priority Ecological Communities (Buffers)

## D.2. References

- Anstee S., Start T., and Morris K. (1997) Mound-builders of the Pilbara. Department of Conservation and Land Management, Western Australia.
- Astron (2013) Ninga Vegetation and Flora Assessment. Prepared for BHP Billiton Iron Ore Pty Ltd, by Astron Environmental Services Pty Ltd, April 2013.
- Bat Call WA (2021a) A review of Pilbara leafnosed bat ecology, threats and survey requirements. Prepared for Department of Agriculture, Water and the Environment, Canberra, November, 2021.
- Bat Call WA (2021b) A review of ghost bat ecology, threats and survey requirements. Prepared for Department of Agriculture, Water and the Environment, Canberra, November, 2021.
- BHP (2023) Application to Amend NVCP CPS 2160/3 Ninga - Native Vegetation Clearing Permit Amendment Application Supporting Document. BHP Iron Ore Pty Ltd, August 2023.
- BHP Iron Ore Pty Ltd (2023) Application to amend a clearing permit, CPS 2160/4, received 3 August 2023.
- Biologic (2014) Consolidation of Regional Fauna Habitat Mapping. Prepared for BPH Billiton Iron Ore Pty Ltd, by Biologic Environmental Survey Pty Ltd.
- Bureau of Meteorology (BoM) (2023) Bureau of Meteorology Website – Climate Data Online, Newman Aero. Bureau of Meteorology. <http://www.bom.gov.au/climate/data/> (Accessed 10 October 2023).
- Department Biodiversity, Conservation and Attractions (DBCA) (2022) A Desktop Assessment and Field Survey of the Vegetation and Conservation-listed Flora within Proposed Gravel Pit Expansions in Karijini National Park. Government of Western Australia, Perth.
- Department of Biodiversity, Conservation and Attractions (DBCA) (2023) Threatened Ecological Community Fact Sheet: Ethel Gorge aquifer stygobiont community. Government of Western Australia.
- Department of Environment Regulation (DER) (2014) *A guide to the assessment of applications to clear native vegetation*. Perth. Available from: [https://www.der.wa.gov.au/images/documents/your-environment/native-vegetation/Guidelines/Guide2\\_assessment\\_native\\_veg.pdf](https://www.der.wa.gov.au/images/documents/your-environment/native-vegetation/Guidelines/Guide2_assessment_native_veg.pdf)
- Department of Planning, Lands and Heritage (DPLH) (2023) Aboriginal Heritage Inquiry System. Department of Planning, Lands and Heritage. <https://espatial.dplh.wa.gov.au/AHIS/index.html?viewer=AHIS> (Accessed 24 October 2023).
- Department of Primary Industries and Regional Development (DPIRD) (2023) NRInfo Digital Mapping. Department of Primary Industries and Regional Development. Government of Western Australia. URL: <https://dpiird.maps.arcgis.com/apps/webappviewer/index.html?id=662e8cbf2def492381fc915aaf3c6a0f> (Accessed 10 October 2023).
- Department of Water and Environmental Regulation (DWER) (2021) Procedure: Native vegetation clearing permits. Joondalup. Available from: [https://dwer.wa.gov.au/sites/default/files/Procedure\\_Native\\_vegetation\\_clearing\\_permits\\_v1.pdf](https://dwer.wa.gov.au/sites/default/files/Procedure_Native_vegetation_clearing_permits_v1.pdf)
- DoW (2007) Public Drinking Water Source Area (PDWSA) Advice. Advice to Assessing Officer, Native Vegetation Assessment Branch, Department of Industry and Resources (DoIR). Department of Water, Western Australia.
- Eco Logical (2013) Ninga Level 1 Vertebrate Fauna Assessment. Prepared for BPH Billiton Iron Ore Pty Ltd, by Eco Logical Australia Pty Ltd, September 2013.
- Environmental Protection Authority (EPA) (2016) Technical Guidance - Flora and Vegetation Surveys for Environmental Impact Assessment. Available from: [http://www.epa.wa.gov.au/sites/default/files/Policies\\_and\\_Guidance/EPA%20Technical%20Guidance%20-%20Flora%20and%20Vegetation%20survey\\_Dec13.pdf](http://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/EPA%20Technical%20Guidance%20-%20Flora%20and%20Vegetation%20survey_Dec13.pdf)
- GHD (2019) Jimblebar East and Caramulla Fauna Survey. Prepared for BPH Billiton Iron Ore Pty Ltd, by GHD Pty Ltd, August 2019.
- Government of Western Australia (2014) Newman Water Reserve: Drinking water source protection review, Newman Town Water Supply, Department of Water, Water Resource Protection Series No WRP 146.

- Government of Western Australia (2019) 2018 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of March 2019. WA Department of Biodiversity, Conservation and Attractions. <https://catalogue.data.wa.gov.au/dataset/dbca-statewide-vegetation-statistics>
- Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- Northcote, K. H. with Beckmann G G, Bettenay E., Churchward H. M., van Dijk D. C., Dimmock G. M., Hubble G. D., Isbell R. F., McArthur W. M., Murtha G. G., Nicolls K. D., Paton T. R., Thompson C. H., Webb A. A. and Wright M. J. (1960-68) Atlas of Australian Soils, Sheets 1 to 10, with explanatory data. CSIRO and Melbourne University Press: Melbourne.
- Onshore Environmental (2014) Consolidation of Regional Vegetation Mapping BHP Billiton Iron Ore Pilbara Tenure. Prepared for BPH Billiton Iron Ore Pty Ltd, by Onshore Environmental Consultants Pty Ltd, June 2014.
- Onshore Environmental (2015) Eastern Ridge Revised Proposal Flora and Vegetation Impact Assessment. Prepared for BPH Billiton Iron Ore Pty Ltd, by Onshore Environmental Consultants Pty Ltd, November 2015.
- Onshore Environmental (2019) Jiblebar North Reconnaissance Flora and Vegetation Survey. Prepared for BPH Western Australia Iron Ore, by Onshore Environmental Consultants Pty Ltd, January 2019.
- Spectrum (2022) East Ophthalmia & Ninga Detailed Flora and Vegetation Survey. Prepared for BHP WAIO, by Spectrum Ecology Pty Ltd, May 2023.
- Van Vreeswyk, A.M.E., Payne, A.L., Leighton, K.A. and Hennig, P. (2004) An inventory and condition survey of the Pilbara Region, Western Australia. Technical Bulletin No. 92. Department of Agriculture, South Perth, Western Australia.
- Western Australian Herbarium (1998-) FloraBase - the Western Australian Flora. Department of Biodiversity, Conservation and Attractions, Western Australia. <https://florabase.dpaw.wa.gov.au/> (Accessed 10 October 2023).

## 4. Glossary

### Acronyms:

<b>BC Act</b>	<i>Biodiversity Conservation Act 2016</i> , Western Australia
<b>BoM</b>	Bureau of Meteorology, Australian Government
<b>DAA</b>	Department of Aboriginal Affairs, Western Australia (now DPLH)
<b>DAFWA</b>	Department of Agriculture and Food, Western Australia (now DPIRD)
<b>DCCEEW</b>	Department of Climate Change, Energy, the Environment and Water, Australian Government
<b>DBCA</b>	Department of Biodiversity, Conservation and Attractions, Western Australia
<b>DER</b>	Department of Environment Regulation, Western Australia (now DWER)
<b>DMIRS</b>	Department of Mines, Industry Regulation and Safety, Western Australia
<b>DMP</b>	Department of Mines and Petroleum, Western Australia (now DMIRS)
<b>DoEE</b>	Department of the Environment and Energy (now DCCEEW)
<b>DoW</b>	Department of Water, Western Australia (now DWER)
<b>DPaW</b>	Department of Parks and Wildlife, Western Australia (now DBCA)
<b>DPIRD</b>	Department of Primary Industries and Regional Development, Western Australia
<b>DPLH</b>	Department of Planning, Lands and Heritage, Western Australia
<b>DRF</b>	Declared Rare Flora (now known as Threatened Flora)
<b>DWER</b>	Department of Water and Environmental Regulation, Western Australia
<b>EP Act</b>	<i>Environmental Protection Act 1986</i> , Western Australia
<b>EPA</b>	Environmental Protection Authority, Western Australia
<b>EPBC Act</b>	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Federal Act)
<b>GIS</b>	Geographical Information System
<b>ha</b>	Hectare (10,000 square metres)
<b>IBRA</b>	Interim Biogeographic Regionalisation for Australia
<b>IUCN</b>	International Union for the Conservation of Nature and Natural Resources – commonly known as the World Conservation Union
<b>PEC</b>	Priority Ecological Community, Western Australia
<b>RIWI Act</b>	<i>Rights in Water and Irrigation Act 1914</i> , Western Australia
<b>TEC</b>	Threatened Ecological Community

### Definitions:

{DBCA (2019) Conservation Codes for Western Australian Flora and Fauna. Department of Biodiversity, Conservation and Attractions, Western Australia}:-

#### T Threatened species:

Listed by order of the Minister as Threatened in the category of critically endangered, endangered or vulnerable under section 19(1), or is a rediscovered species to be regarded as threatened species under section 26(2) of the *Biodiversity Conservation Act 2016* (BC Act).

**Threatened fauna** is that subset of 'Specially Protected Fauna' listed under schedules 1 to 3 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for Threatened Fauna.

**Threatened flora** is that subset of 'Rare Flora' listed under schedules 1 to 3 of the *Wildlife Conservation (Rare Flora) Notice 2018* for Threatened Flora.

The assessment of the conservation status of these species is based on their national extent and ranked according to their level of threat using IUCN Red List categories and criteria as detailed below.

**CR Critically endangered species**  
Threatened species considered to be “*facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines*”.

Listed as critically endangered under section 19(1)(a) of the BC Act in accordance with the criteria set out in section 20 and the ministerial guidelines. Published under schedule 1 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for critically endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for critically endangered flora.

**EN Endangered species**  
Threatened species considered to be “*facing a very high risk of extinction in the wild in the near future, as determined in accordance with criteria set out in the ministerial guidelines*”.

Listed as endangered under section 19(1)(b) of the BC Act in accordance with the criteria set out in section 21 and the ministerial guidelines. Published under schedule 2 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for endangered flora.

**VU Vulnerable species**  
Threatened species considered to be “*facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with criteria set out in the ministerial guidelines*”.

Listed as vulnerable under section 19(1)(c) of the BC Act in accordance with the criteria set out in section 22 and the ministerial guidelines. Published under schedule 3 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for vulnerable fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for vulnerable flora.

#### **Extinct Species:**

**EX Extinct species**  
Species where “*there is no reasonable doubt that the last member of the species has died*”, and listing is otherwise in accordance with the ministerial guidelines (section 24 of the BC Act).

Published as presumed extinct under schedule 4 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for extinct fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for extinct flora.

**EW Extinct in the wild species**  
Species that “*is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; and it has not been recorded in its known habitat or expected habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its life cycle and form*”, and listing is otherwise in accordance with the ministerial guidelines (section 25 of the BC Act).

Currently there are no threatened fauna or threatened flora species listed as extinct in the wild. If listing of a species as extinct in the wild occurs, then a schedule will be added to the applicable notice.

#### **Specially protected species:**

Listed by order of the Minister as specially protected under section 13(1) of the BC Act. Meeting one or more of the following categories: species of special conservation interest; migratory species; cetaceans; species subject to international agreement; or species otherwise in need of special protection.

Species that are listed as threatened species (critically endangered, endangered or vulnerable) or extinct species under the BC Act cannot also be listed as Specially Protected species.

**MI Migratory species**  
Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or the species is subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth; and listing is otherwise in accordance with the ministerial guidelines (section 15 of the BC Act).

Includes birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and fauna subject to the *Convention on the Conservation of Migratory Species of Wild Animals* (Bonn Convention), an environmental treaty under the United Nations Environment Program. Migratory species listed under the BC Act are a subset of the migratory animals, that are known to visit Western Australia, protected under the international agreements or treaties, excluding species that are listed as Threatened species.

Published as migratory birds protected under an international agreement under schedule 5 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

- CD Species of special conservation interest (conservation dependent fauna)**  
Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened, and listing is otherwise in accordance with the ministerial guidelines (section 14 of the BC Act).  
Published as conservation dependent fauna under schedule 6 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.
- OS Other specially protected species**  
Fauna otherwise in need of special protection to ensure their conservation, and listing is otherwise in accordance with the ministerial guidelines (section 18 of the BC Act).  
Published as other specially protected fauna under schedule 7 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.
- P Priority species:**  
Possibly threatened species that do not meet survey criteria, or are otherwise data deficient, are added to the Priority Fauna or Priority Flora Lists under Priorities 1, 2 or 3. These three categories are ranked in order of priority for survey and evaluation of conservation status so that consideration can be given to their declaration as threatened fauna or flora.  
Species that are adequately known, are rare but not threatened, or meet criteria for near threatened, or that have been recently removed from the threatened species or other specially protected fauna lists for other than taxonomic reasons, are placed in Priority 4. These species require regular monitoring.  
Assessment of Priority codes is based on the Western Australian distribution of the species, unless the distribution in WA is part of a contiguous population extending into adjacent States, as defined by the known spread of locations.
- P1 Priority One - Poorly-known species**  
Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.
- P2 Priority Two - Poorly-known species**  
Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.
- P3 Priority Three - Poorly-known species**  
Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.
- P4 Priority Four - Rare, Near Threatened and other species in need of monitoring**  
(a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection but could be if present circumstances change. These species are usually represented on conservation lands.  
(b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for vulnerable but are not listed as Conservation Dependent.  
(c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.

**Principles for clearing native vegetation:**

- (a) Native vegetation should not be cleared if it comprises a high level of biological diversity.
- (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.
- (c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora.

- (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.
- (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.
- (f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.
- (g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.
- (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.
- (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.
- (j) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.