



# Clearing Permit Decision Report

## 1. Application details and outcomes

### 1.1. Permit application details

<b>Permit number:</b>	10035/1
<b>Permit type:</b>	Purpose Permit
<b>Applicant name:</b>	Hamersley Iron Pty Ltd
<b>Application received:</b>	20 December 2022
<b>Application area:</b>	10 hectares
<b>Purpose of clearing:</b>	Mineral Exploration
<b>Method of clearing:</b>	Mechanical Removal
<b>Tenure:</b>	<i>Iron Ore (Hamersley Range) Agreement Act 1963</i> , Mineral Lease 4SA (AML 70/4)
<b>Location (LGA area/s):</b>	Shire of Ashburton
<b>Colloquial name:</b>	Caliwingina and Mt Pyrton Project

### 1.2. Description of clearing activities

Hamersley Iron Pty Ltd proposes to clear up to 10 hectares of native vegetation within a boundary of approximately 64.4 hectares, for the purpose of mineral exploration. The project is located approximately 97 kilometres north-west of Tom Price, within the Shire of Ashburton.

The application is to allow for mineral exploration.

### 1.3. Decision on application and key considerations

<b>Decision:</b>	Grant
<b>Decision date:</b>	19 December 2023
<b>Decision area:</b>	10 hectares of native vegetation

### 1.4. Reasons for decision

This clearing permit application was made in accordance with section 51E of the *Environmental Protection Act 1986* (EP Act) and was received by the Department of Mines, Industry Regulation and Safety (DMIRS) (now the Department of Energy, Mines, Industry Regulation and Safety) on 24 January 2023. DMIRS advertised the application for a public comment for a period of 21 days, and no submissions were received.

In making this decision, the Delegated Officer had regard for the site characteristics (Appendix A), relevant datasets (Appendix D), supporting information provided by the applicant, including the results of a flora and vegetation survey, the clearing principles set out in Schedule 5 of the EP Act (Appendix C), 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:

- avoid, minimise to reduce the impacts and extent of clearing;
- the potential introduction and spread of weeds into adjacent vegetation, which could impact on the quality of the adjacent vegetation and its habitat values;
- where practicable, avoid clearing riparian vegetation.

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 is unlikely to lead to have adverse impacts on the conservation of significant flora and fauna and the impacts of clearing can be minimised and managed to be unlikely to lead to an unacceptable risk to environmental values.

The Delegated Officer decided to grant a clearing permit subject to conditions to:

- avoid, minimise to reduce the impacts and extent of clearing;
- take hygiene steps to minimise the risk of the introduction and spread of weeds; and
- avoid impacts to riparian vegetation and maintain surface water flow.

## 1.5. Site map

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

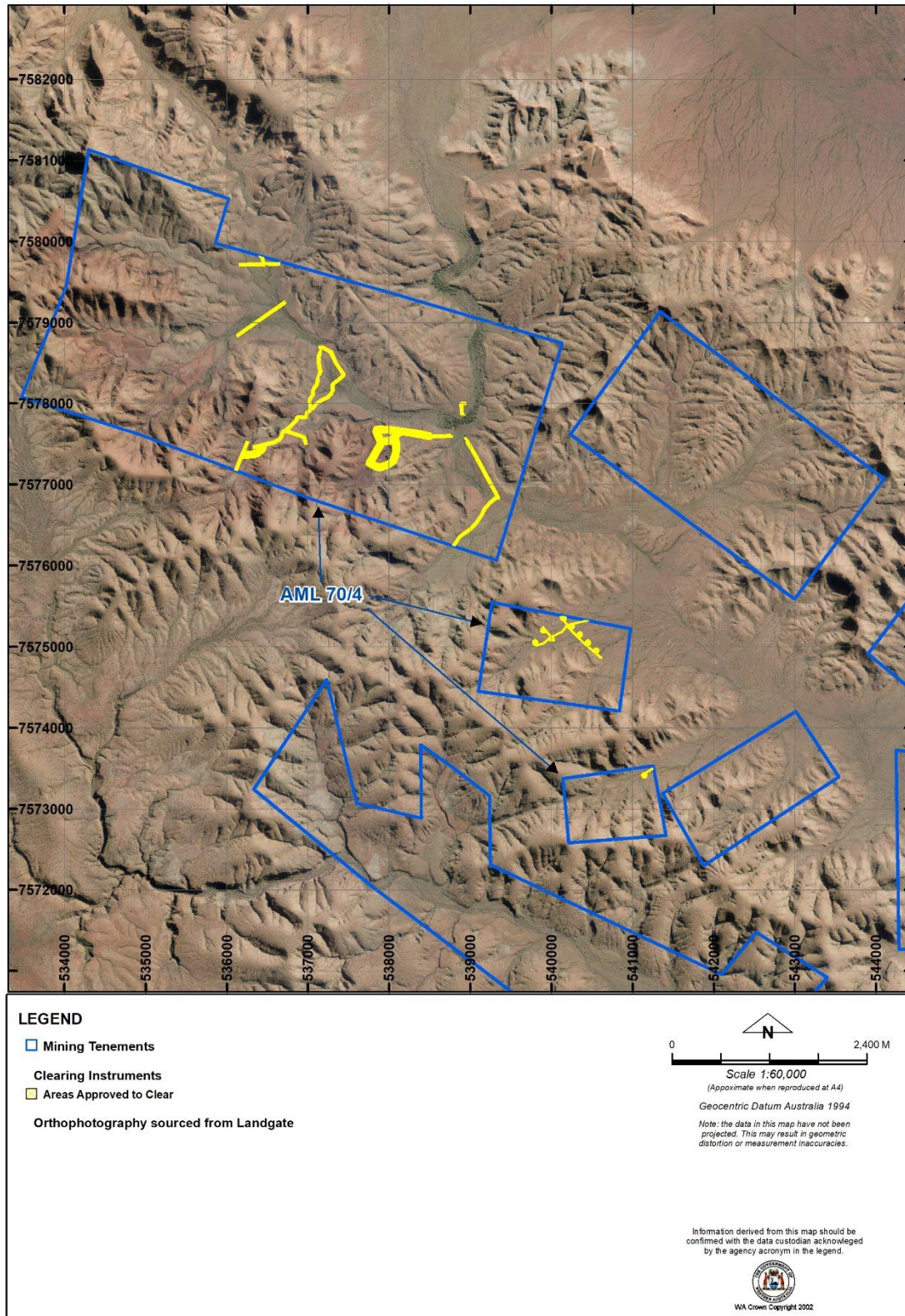


Figure 1. Map of the application area. The yellow area indicates the area within which conditional authorised clearing can occur under the granted clearing permit.

## 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)
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act)
- *Mining Act 1978* (WA)

Relevant agreements (treatys) considered during the assessment include:

- Japan-Australia Migratory Bird Agreement
- China-Australia Migratory Bird Agreement
- Republic of Korea-Australia Migratory Bird Agreement

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) (Delete if flora surveys not included)
- Technical guidance – *Terrestrial Fauna Surveys for Environmental Impact Assessment* (EPA, 2020) (Delete if fauna surveys not included)

## 3. Detailed assessment of application

### 3.1. Avoidance and mitigation measures

No evidence of avoidance or mitigation measures was provided to support the application.

### 3.2. Assessment of impacts on environmental values

In assessing the application, the Delegated Officer has had regard for the site characteristics (see Appendix A) 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 (see Appendix B) identified the impacts of the proposed clearing are limited and able to be managed to be environmentally acceptable with standard avoid and minimise / hygiene / vegetation management conditions.

#### 3.2.1. Biological values - Clearing Principle (a)

##### Assessment

The study area was surveyed by Rio Tinto (2022) ecologists on the 10-11th March 2022. Three Priority flora listed species were recorded during the survey: two Priority 3 species, *Indigofera rivularis* and *Triodia basitricha*, and one Priority 4 flora species, *Rhynchosia bungarensis*.

*Indigofera rivularis* (P3) is an erect perennial shrub growing to 2 m in height (Western Australian Herbarium, 1998-). This species generally grows along creek lines, drainage lines, gorges and gullies (Western Australian Herbarium, 1998-). This species was recorded at seven locations on the broad wash plains and creeklines within the study area. The Rio Tinto (2022) database currently contains the records of approximately 450 individuals at 23 locations within a 20 kilometre radius of the application area.

*Triodia basitricha* (P3) is a tussock forming perennial non-resinous grass (Western Australian Herbarium, 1998-). The species occurs in the western and central Pilbara and in the Barlee Range Nature Reserve (Rio Tinto, 2022). The species was widespread throughout the survey area and occurred as a dominant on the stony lower slopes and stony floodplains (Rio Tinto, 2022). Approximately 43,000 individuals were recorded at 42 locations during the survey of the application area and surrounds (Rio Tinto, 2022).

*Rhynchosia bungarensis* (P4) is a compact, prostrate shrub growing to 0.5 m high with yellow flowers (Western Australian Herbarium, 1998-). *Rhynchosia bungarensis* is known from a variety of habitats including hill slopes, floodplains and creek beds across five IBRA subregions (Western Australian Herbarium, 1998-). The species was recorded at three locations in the gorge / gully vegetation within the survey area. The Rio Tinto database currently contains the records of approximately 50 individuals at nine locations within a 20 kilometre radius of the application area (Rio Tinto, 2022).

The proposed clearing of ten hectares within a permit boundary of 64.4 hectares is unlikely to have a significant impact on these species due to the prevalence of suitable habitat for all three of these species outside of the application area and their documented broad ranges across the Pilbara bioregion.

No weed species were recorded within the application area during the flora survey (Rio Tinto, 2022). Weeds have the potential to out-compete native species and reduce the biodiversity of an area, and care should be taken to prevent the introduction and spread of weeds to the application area and surrounding areas. Potential impacts to biodiversity as a result of the proposed clearing may be minimised by implementing a weed management condition.

#### Conclusion

Based on the above assessment, the area proposed to be cleared is unlikely to have impacts on the above Priority flora species. The proposal can be managed to be environmentally acceptable with avoid and minimise, and hygiene management conditions.

#### Conditions

- A weed management condition to minimise the further introduction and spread of weed species in the permit area and surrounds.

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

The clearing permit application was advertised on 24 January 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 are three native title claims (WC1999/012; WC1999/014; WC2003/003) over the area under application (DPLH, 2023). These claims have been determined by the Federal Court on behalf of the claimant groups. However, the mining tenure 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 Heritage Act 1972* 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 part of an expansive tract of native vegetation in the extensive land use zone of Western Australia. The project is located approximately 97 kilometres north-west of Tom Price, within the Shire of Ashburton (GIS Database).
Ecological linkage	The Gorges/ Gullies habitat present within the application area is valuable for its role as an ecological linkage, as it provides a continuous corridor of vegetation cover that allows fauna to traverse large distances (Rio Tinto, 2023). This vegetation type is restricted to the stony gullies on upper hillslopes and accounts for less than 2% of the broader study area, and is very limited within the application area (Rio Tinto, 2022).
Conservation areas	The application area is not located within any vested or proposed conservation areas (GIS Database). The nearest DBCA managed land is the Millstream Chichester National Park, which is located approximately 34 kilometres north-west of the application area (GIS Database).
Vegetation description	<p>The vegetation of the application area is broadly mapped as the following Beard vegetation association: 82: Hummock grasslands, low tree steppe; snappy gum over <i>Triodia wiseana</i> (GIS Database).</p> <p>A flora and vegetation survey was conducted over the application area by Rio Tinto ecologists during March, 2022. The following vegetation associations were recorded within the application area (Rio Tinto, 2022):</p> <p><b>Vegetation of Hillslopes</b></p> <ul style="list-style-type: none"> <li>ChTe/TwTb: <i>Corymbia hamersleyana</i> isolated low trees over open hummock grassland of <i>Triodia epactia</i> (or <i>T. wiseana</i>) and <i>T. basitricha</i>;</li> <li>EIChTeTwTb: Low open woodland to isolated trees of <i>Eucalyptus leucophloia</i> and <i>Corymbia hamersleyana</i> over tall sparse shrubland of <i>Grevillea wickhamii</i> over hummock grassland of <i>Triodia basitricha</i>, <i>T. epactia</i> and <i>T. wiseana</i>;</li> <li>EIChAiTeTw: Low open woodland to isolated trees of <i>Eucalyptus leucophloia</i> and <i>Corymbia hamersleyana</i> over tall sparse shrubland of <i>Acacia inaequilatera</i> and <i>Grevillea wickhamii</i> over hummock grassland of <i>Triodia epactia</i> and <i>T. wiseana</i>;</li> </ul> <p><b>Vegetation of Gorges/ Gullies</b></p> <ul style="list-style-type: none"> <li>CfFbCaEm: <i>Corymbia ferritcola</i> and <i>Ficus brachypoda</i> isolated low trees over tall sparse shrubland of <i>Acacia monticola</i> over grassland of <i>Triodia epactia</i>, <i>Eriachne mucronata</i> and <i>Cymbopogon ambiguus</i>;</li> </ul> <p><b>Vegetation of Plains</b></p> <ul style="list-style-type: none"> <li>ChApAmTe: Low open woodland of <i>Corymbia hamersleyana</i> over tall sparse shrubland of <i>Acacia pyrifolia</i> and <i>A. monticola</i> over hummock grassland of <i>Triodia epactia</i>;</li> </ul> <p><b>Vegetation of Minor Flowlines</b></p> <ul style="list-style-type: none"> <li>ChAtTe: Low open woodland to isolated trees of <i>Corymbia hamersleyana</i> over tall open to sparse shrubland of <i>Acacia tumida</i> subsp. <i>Pilbarensis</i> over sparse to open hummock grassland of <i>Triodia epactia</i>.</li> </ul>
Vegetation condition	<p>The vegetation survey indicate the vegetation within the proposed clearing area is in Excellent to Completely Degraded (Trudgen, 1991) condition, described as</p> <ul style="list-style-type: none"> <li>Completely Degraded - Areas that are completely or almost completely without native species in the structure of their vegetation; i.e. areas that are cleared or 'parkland cleared' with their flora comprising weed or crop species with isolated native trees or shrubs.</li> <li>Excellent: Pristine or nearly so, no obvious signs of damage caused by human activities since European settlement.</li> </ul> <p>The full Trudgen (1991) condition rating scale is provided in Appendix C.</p>
Climate and landform	The application area is mapped within elevations of 440 – 460 meters AHD (GIS Database). The climate of the region is tropical semi-arid to dry, with an annual rainfall average of approximately 461.8 millimetres (BoM, 2023).
Soil description	The soil is mapped as Fa13 (GIS Database). The Fa13 soil unit is described as 'Ranges of banded jaspillite 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

Characteristic	Details
	are frequently stony and shallow and there are extensive areas without soil cover (Northcote et. al, 1960-68; GIS Database).
Land degradation risk	The application area is located within the Boolgeeda Land System and Newman Land System (GIS Database). These land systems are described as: <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.</li> <li>• Newman Land System: Rugged jaspilite plateaux, ridges and mountains supporting hard spinifex grasslands.</li> </ul> <p>These land systems are generally not susceptible to erosion.</p>
Waterbodies	There are no permanent waterbodies or watercourses within the application area, however, there are numerous minor non-perennial watercourses present (GIS Database).
Hydrogeography	The application area is situated within the Priority 2 section of the Millstream Water Reserve (GIS Database).
Flora	Three Priority flora listed species were recorded during the survey: two Priority 3 species, <i>Indigofera rivularis</i> and <i>Triodia basitricha</i> , and one Priority 4 flora species, <i>Rhynchosia bungarensis</i> .
Ecological communities	A search of available databases revealed there are no known Threatened Ecological Communities (TECs) or Priority Ecological Communities (PECs) within the application area (GIS Database). The flora surveys conducted over the application area have not identified any TECs or PECs (Rio Tinto, 2022). The nearest known ecological community is the Priority 3 Kanjenjie Land System, located approximately 14 kilometres north of the application area (GIS Database).
Fauna	Three broad fauna habitat types were recorded within the survey area: Scree/ Hillslope; Drainage; and Valley. These fauna habitats are not considered to be restricted at a local or regional level (Rio Tinto, 2022). No conservation significant fauna species were observed during the survey of the application area (Rio Tinto, 2022).

## A.2. Flora analysis table

With consideration for the site characteristics set out above, relevant datasets (see Appendix D.1), and biological survey information (Rio Tinto, 2022), impacts to the following conservation significant flora required further consideration.

Species	Status	NM	RT	EPBC	Recorded during survey / notes on habitat, or lack of, within study area	Likelihood of occurrence (post-field)
<i>Acacia dawweana</i>	P3	X			Suitable habitat was present within the survey area however this easily detectable perennial shrub species was not observed during the survey and is therefore unlikely to be present	Unlikely
<i>Gymnanthera cunninghamii</i>	P3			X	Suitable habitat was present within the survey area however this easily detectable perennial shrub species was not observed during the survey and is therefore unlikely to be present	Unlikely
<i>Indigofera rivularis</i>	P3	X		X	Recorded during survey	Recorded
<i>Rostellularia adscendens</i> var. <i>latifolia</i>	P3			X	Due to the small size of this species it may have been overlooked during previous surveys within the study area. Given its broad distribution, and the low impact nature of the Proposal the conservation status of this species is unlikely to be impacted.	Potential
<i>Sida</i> sp. Barlee Range (S. van Leeuwen 1642)	P3			X	No suitable habitat recorded within the study area.	Unlikely
<i>Sida</i> sp. Hamersley Range (K. Newbey 10692)	P3			X	No suitable habitat recorded within the study area.	Unlikely
<i>Solanum albestellatum</i>	P3	X			No suitable habitat recorded within the study area.	Unlikely
<i>Themeda</i> sp. Hamersley Station (M.E. Trudgen 11431)	P3			X	No suitable habitat recorded within the study area.	Unlikely
<i>Triodia basitricha</i> (Pilbara Curly Spinifex)	P3			X	Recorded during survey	Recorded
<i>Triodia</i> sp. Mt Ella (M.E. Trudgen 12739)	P3			X	No suitable habitat recorded within the study area.	Unlikely
<i>Goodenia nuda</i>	P4	X		X	Due to the small size of this species it may have been overlooked during the current survey. Given its broad range of habitats and distribution, and the low impact nature of the Proposal the conservation status of this species is unlikely to be impacted.	Potential
<i>Rhynchosia bungarensis</i>	P4			X	Recorded during survey	Recorded

**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> "Native vegetation should not be cleared if it comprises a high level of biodiversity."</p> <p><u>Assessment:</u></p> <p>A total of 90 taxa from 57 genera representing 30 families were recorded during the survey (Rio Tinto, 2022). There are no known Threatened flora, Threatened or Priority Ecological Communities within the permit area (Rio Tinto, 2022; GIS Database). Three Priority flora species have been recorded within the application area (Rio Tinto, 2022).</p>	May be at variance	Yes <i>Refer to Section 3.2.1, above.</i>
<p><u>Principle (b):</u> "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."</p> <p><u>Assessment:</u></p> <p>A total of three fauna habitats were mapped in the survey area based on vegetation, landforms and micro habitat. All habitats are well represented outside the application areas (Rio Tinto, 2022; GIS Database).</p> <p>No conservation significant fauna species were observed during the survey (Rio Tinto, 2022). Evidence of one Priority 4 species, the Western Pebble-mound Mouse, in the form of an old inactive mound was recorded from within the survey area. However, no other evidence of the Western Pebble-mound Mouse was observed (Rio Tinto, 2022).</p> <p>Two threatened fauna species, <i>Macroderma gigas</i> (Ghost bat) and <i>Dasyurus hallocatus</i> (Northern Quoll) were considered 'potential' occurrences within the survey area however, due to the small size of the application area, it is considered unlikely the proposed clearing will negatively impact these conservation significant species, on a local or regional scale (Rio Tinto, 2022).</p>	Not likely to be at variance	No
<p><u>Principle (c):</u> "Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora."</p> <p><u>Assessment:</u></p> <p>There are no known records of Threatened flora within the application area (GIS Database). A flora survey of the application area did not record any species of Threatened flora (Rio Tinto, 2022).</p>	Not likely to be at variance	No
<p><u>Principle (d):</u> "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."</p> <p><u>Assessment:</u></p> <p>There are no known Threatened Ecological Communities (TECs) located within or in close proximity to the application area (GIS Database).</p> <p>A flora and vegetation survey of the application area did not identify any TECs (Rio Tinto, 2022).</p>	Not likely to be at variance	No
<b>Environmental value: significant remnant vegetation and conservation areas</b>		
<p><u>Principle (e):</u> "Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared."</p> <p><u>Assessment:</u></p> <p>The application area is located within the Pilbara Interim Biogeographic Regionalisation for Australia (IBRA) bioregion (GIS Database). Approximately 99% of the pre-European vegetation still exists in the Pilbara Bioregion (Government of Western Australia, 2019).</p> <p>The vegetation of the application area is broadly mapped as Beard vegetation association 82 (GIS Database). Approximately 99% of the pre-European extent of this vegetation association remains uncleared at both the state and bioregional level (Government of Western Australia, 2019).</p>	Not at variance	No
<p><u>Principle (h):</u> "Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area."</p>	Not likely to be at variance	No

Assessment against the clearing principles	Variance level	Is further consideration required?
<p><u>Assessment:</u></p> <p>Given the distance to the nearest conservation area (approximately 14 kilometres), the proposed clearing is not likely to have an impact on the environmental values of nearby conservation areas.</p>		
<b>Environmental value: land and water resources</b>		
<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>The application area has numerous minor ephemeral drainage lines (GIS Database). Drainage lines within the application area are only likely to flow following major rainfall events. As the vegetation associated with these ephemeral drainage lines may be cleared, it is recommended to maintain surface water flow or reinstate downstream into existing natural drainage lines.</p> <p>Potential impacts to watercourses be managed through the continuous implementation of a vegetation management condition, which includes avoiding clearing riparian vegetation and maintaining surface water flow.</p>	At variance	No
<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 is located within the Boolgeeda Land System and Newman Land Systems (GIS Database). The proposed clearing of up to 10 hectares of native vegetation within a boundary of approximately 64.4 hectares, for the purpose of mineral exploration is unlikely to cause appreciable land degradation.</p>	Not likely to be at variance	No
<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 situated within the Priority 2 - Millstream Water Reserve Public Drinking Water Source Area (GIS Database). Prior written advice from the Department of Water (DoW) (now the Department of Water and Environmental Regulation (DWER)) indicated that clearing 10 hectares of native vegetation for the purpose of mineral exploration activities is unlikely to have an impact on groundwater quality (DoW, 2014).</p> <p>There are no permanent watercourses or wetlands within the area proposed to clear (GIS Database). Creek lines in the region are dry for most of the year, only flowing briefly immediately following significant rainfall. The proposed clearing is unlikely to result in significant changes to surface water flows.</p>	Not likely to be at variance	No
<p><u>Principle (j):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.”</i></p> <p><u>Assessment:</u></p> <p>The climate of the region is tropical semi-arid to dry, with an annual rainfall average of approximately 461.8 millimetres (BoM, 2023).</p> <p>There are no permanent water courses or waterbodies within the application area (GIS Database). Seasonal drainage lines are common in the region and temporary localised flooding may occur briefly following heavy rainfall events. However, the proposed clearing is unlikely to increase the incidence or intensity of natural flooding events.</p>	Not likely to be at variance	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 Trudgen, M.E. (1991) *Vegetation condition scale* in National Trust (WA) 1993 Urban Bushland Policy. National Trust of Australia (WA), Wildflower Society of WA (Inc.), and the Tree Society (Inc.), Perth.



## Measuring vegetation condition for the Eremaean and Northern Botanical Provinces (Trudgen, 1991)

Condition	Description
Excellent	Pristine or nearly so, no obvious signs of damage caused by human activities since European settlement.
Very good	Some relatively slight signs of damage caused by human activities since European settlement. For example, some signs of damage to tree trunks caused by repeated fire, the presence of some relatively non-aggressive weeds, or occasional vehicle tracks.
Good	More obvious signs of damage caused by human activity since European settlement, including some obvious impact on the vegetation structure such as that caused by low levels of grazing or slightly aggressive weeds.
Poor	Still retains basic vegetation structure or ability to regenerate it after very obvious impacts of human activities since European settlement, such as grazing, partial clearing, frequent fires or aggressive weeds.
Very poor	Severely impacted by grazing, very frequent fires, clearing or a combination of these activities. Scope for some regeneration but not to a state approaching good condition without intensive management. Usually with a number of weed species present including very aggressive species.
Completely degraded	Areas that are completely or almost completely without native species in the structure of their vegetation; i.e. areas that are cleared or 'parkland cleared' with their 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)):

- 10 Metre Contours (DPIRD-073)
- 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, Linear (DWER-031)
- IBRA Vegetation Statistics
- Pre-European Vegetation Statistics
- 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

- Bureau of Meteorology (BoM) (2023) Bureau of Meteorology Website – Climate Data Online, Tom Price. Bureau of Meteorology. <http://www.bom.gov.au/climate/data/> (Accessed 5 December 2023).
- 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 5 December 2023).
- DoW (2014) Department of Water advice regarding potential impacts to Public Drinking Water Source Millstream Water Reserve. WA Department of Water, Perth.
- 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)
- 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)

- Environmental Protection Authority (EPA) (2020) Technical Guidance – Terrestrial Fauna Surveys. Available from: [https://www.epa.wa.gov.au/sites/default/files/Policies\\_and\\_Guidance/2020.09.17%20-%20EPA%20Technical%20Guidance%20-%20Vertebrate%20Fauna%20Surveys%20-%20Final.pdf](https://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/2020.09.17%20-%20EPA%20Technical%20Guidance%20-%20Vertebrate%20Fauna%20Surveys%20-%20Final.pdf)
- 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>
- 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.
- Rio Tinto (2022) Flora, Vegetation and Fauna Habitat Assessment – Caliwingina and Mt Pyrtou. Unpublished report prepared by Rio Tinto, August 2022.
- Trudgen, M.E. (1991) Vegetation condition scale in National Trust (WA) 1993 Urban Bushland Policy. National Trust of Australia (WA), Wildflower Society of WA (Inc.), and the Tree Society (Inc.), Perth.
- Western Australian Herbarium (1998-) FloraBase - the Western Australian Flora. Department of Biodiversity, Conservation and Attractions, Western Australia. <https://florabase.dpaw.wa.gov.au/> (Accessed 7 December 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.