



Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 5139/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: Hamersley Iron Pty Ltd

1.3. Property details

Property: *Iron Ore (Hamersley Range) Agreement Act 1963*, Mineral Lease 4SA (AML70/4)
Miscellaneous Licence 47/141
Miscellaneous Licence 47/152
Miscellaneous Licence 47/153
Local Government Area: Shire of Ashburton
Colloquial name: Brockman Syncline 4 to Nammuldi Project

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
41		Mechanical Removal	Water pipeline and associated infrastructure

1.5. Decision on application

Decision on Permit Application:
Decision Date:

2. Site Information

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description Beard vegetation associations have been mapped for the whole of Western Australia and are useful to look at vegetation in a regional context. Three Beard vegetation associations have been mapped within the application area:

Beard vegetation association 18: Low woodland; mulga (*Acacia aneura*);
Beard vegetation association 82: Hummock grasslands, low tree steppe; snappy gum over *Triodia wiseana*; and
Beard vegetation association 175: Short bunch grassland - savanna/grass plain (Pilbara) (Government of Western Australia, 2011; GIS Database).

Biota Environmental Sciences (2010a) conducted a biological review using existing data for the project by Hamersley Iron Pty Ltd. In addition to compiling results from previous surveys, a systematic rare flora survey was conducted in June 2010 to cover areas of the proposed corridor that had not been included in past surveys (Strategen Environmental Consultants, 2011). The biological review identified and mapped 29 vegetation types associated with three landform types:

- Stony hills;
- Plains; and
- Drainage areas/creeks (Biota Environmental Sciences, 2010a).

Biota Environmental Sciences (2010a) mapped the vegetation types as:

A1 - Tall shrubland dominated by *Acacia maillandii* over *Triodia wiseana*;
A2 - *Eucalyptus leucophloia* over *Triodia wiseana*;
A5 - Open tall shrubs dominated by *Acacia exilis* over *Triodia wiseana*;
A6 - Mixed *Cassia*, *Acacia* shrubland over *Triodia pungens*;
B2 - *Acacia aneura* tall closed scrub over *Triodia pungens*;
B3 - *Acacia aneura*, *A. ayersiana* tall shrubland over *Triodia wiseana*;
B4 - Open *Eucalyptus* over mixed tall shrubs;
B7 - Mixed tall closed scrub;
B8 - *Acacia ancistrocarpa*, *A. atkinsiana*, *A. exilis* tall closed shrubland;
C1 - *Eucalyptus victrix* scattered low trees to open woodland over *Goodenia lamprosperma*, *Pluchea dentex* very open herbland;
C2 - *Acacia pyrifolia*, *A. ancistrocarpa*, *Petalostylis labicheoides* shrubland over *Bonamia rosea*, *Tephrosia rosea* var. *glabrior* low open shrubland over *Triodia epactia* hummock grassland and *Themeda triandra* very open tussock grassland;
C5 - *Eucalyptus xerothermica*, *Corymbia hamersleyana* scattered low trees over *Acacia bivenosa*, *A. cowleana*, *A. elachantha*, *A. exilis* tall shrubland over *Triodia epactia* open hummock grassland and *Eulalia aurea* open tussock grassland;
C6 - *Eucalyptus xerothermica* scattered low trees over *Gastrolobium grandiflorum* open heath over *Chrysopogon*

fallax, *Eulalia aurea* tussock grassland;
C9 - *Corymbia hamersleyana*, *Eucalyptus leucophloia* low woodland over *Grevillea wickhamii* tall shrubland over *Gossypium robinsonii* open shrubland over *Themeda triandra*, *Eulalia aurea* and *Paraneurachne muelleri* open tussock grassland and *Triodia epactia* open hummock grassland;
C10 - *Eucalyptus leucophloia*, *Corymbia deserticola* scattered low trees over *Acacia tumida* var. *pilbarensis* tall open scrub over *Triodia epactia*, *T. wiseana* open hummock grassland;
C11 - *Acacia citrinoviridis*, *A. ancistrocarpa* tall open shrubland to tall closed scrub over *Triodia epactia* hummock grassland;
C12 - *Acacia monticola*, *A. maitlandii*, *A. atkinsiana* tall open shrubland over *Triodia epactia*, *T. wiseana* hummock grassland to open hummock grassland;
C17 - *Acacia aneura* low woodland to low open forest over *Chrysopogon fallax*, *Triodia epactia* open tussock/hummock grassland;
EIAmAexTwERIm - *Eucalyptus leucophloia* subsp. *leucophloia* scattered low trees over *Acacia maitlandii*, *A. exilis* shrubland over *Triodia wiseana* hummock grassland over *Eriachne mucronata* very open tussock grassland;
ExAbAatAmTe - *Eucalyptus xerothermica* low woodland over *Acacia bivenosa*, *A. atkinsiana*, *A. maitlandii* shrubland to closed heath over *Triodia epactia* hummock grassland;
H1 - *Corymbia hamersleyana* scattered trees over *Cassia pruinosa* open shrubland over *Triodia wiseana* open hummock grassland;
H14 - *Eucalyptus leucophloia* scattered low trees over *Triodia wiseana* hummock grassland;
H15 - *Eucalyptus leucophloia* scattered low trees over *Triodia epactia* hummock grassland;
H7 - *Acacia stowardii* low open woodland over *Eremophila exilifolia* scattered shrubs over *Triodia epactia* hummock grassland;
H9 - *Eucalyptus leucophloia* scattered low trees over *Acacia inaequilatera* tall shrubland over *Triodia wiseana* hummock grassland;
P3 - *Eucalyptus leucophloia* scattered low trees over *Acacia aneura* (various forms), *A. ayersiana* tall open shrubland over *Triodia epactia*, *T. wiseana* hummock grassland;
P4 - *Acacia xiphophylla*, *A. aneura* low woodland to tall open shrubland over *Triodia wiseana* hummock grassland;
P6 - *Corymbia deserticola* scattered low trees over *Acacia atkinsiana*, *A. exilis* tall open shrubland over *Triodia wiseana* closed hummock grassland; and
P9 - *Eucalyptus socialis* low open woodland over *Triodia wiseana* open hummock grassland.

Clearing Description	<p>Hamersley Iron Pty Ltd is proposing to clear up to 41 hectares of native vegetation within a larger application area of 1,712 hectares for the Brockman Syncline 4 to Nammuldi Project. The clearing of vegetation is required for the purpose of a water pipeline and associated infrastructure.</p> <p>The vegetation will be cleared using a dozer, blade down. The vegetation and topsoil will be stockpiled separately for use in rehabilitation.</p>
Vegetation Condition	<p>Degraded: Structure severely disturbed; regeneration to good condition requires intensive management (Keighery, 1994);</p> <p>To:</p> <p>Very Good: Vegetation structure altered; obvious signs of disturbance (Keighery, 1994).</p>
Comment	<p>The application area is located in the Hamersley subregion of Western Australia and is situated approximately 60 kilometres north-west of the Tom Price town site (GIS Database).</p> <p>The vegetation condition was derived from a vegetation survey conducted by Biota Environmental Sciences (2010a).</p>

3. Assessment of application against clearing principles

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

Comments	<p>Proposal is not likely to be at variance to this Principle</p> <p>The application area occurs within the Hamersley subregion of the Pilbara Interim Biogeographic Regionalisation of Australia (IBRA) bioregion (GIS Database). This subregion is characterised by mountainous area of Proterozoic sedimentary ranges and plateaux, dissected by gorges. Mulga low woodland over bunch grasses on fine textured soils in valley floors, and <i>Eucalyptus leucophloia</i> over <i>Triodia brizoides</i> on skeletal soils of the ranges (CALM, 2002).</p> <p>Biota Environmental Sciences (2010a) conducted a biological review using existing data for the project by Hamersley Iron Pty Ltd. In addition to compiling results from previous surveys (Halpern Glick Maunsell, 1999; Biota Environmental Sciences, 2005a; 2007a; 2007b; 2008; 2010b), a systematic rare flora survey was conducted in June 2010 to cover areas of the proposed corridor that had not been included in past surveys (Strategen Environmental Consultants, 2011). The flora searches identified a total of 581 vascular plant taxa from 183 genera and 59 families within the application area. Biota Environmental Sciences (2010a) state that the application area has moderate species richness and the application area does not support a high diversity of flora or vegetation units which may be important for the locality or the subregion. The flora and vegetation surveys (Biota Environmental Sciences, 2005a; 2007a; 2007b; 2008; 2010a; 2010b; Halpern Glick Maunsell, 1999) identified 29 vegetation communities within the application area. The condition of the vegetation types was classified from 'very good' to 'degraded' (Keighery, 1994; GIS Database). Of these, two vegetation types were associated with the ephemeral Boolgeeda Creek which crosses through the application area (C1 and C2 vegetation types) (Biota Environmental Sciences, 2010a). These units are considered to have moderate conservation significance as they are known to support numerous species which may be restricted to these habitats (Biota Environmental Sciences, 2010a). Potential impacts to riparian vegetation may be minimised</p>
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through the implementation of a riparian vegetation management condition.

A search on the Department of Environment and Conservation's Threatened and Priority Flora databases revealed one Threatened Flora species and 13 Priority Flora species that may potentially occur in the application area (DEC, 2012). There were two Priority Flora species recorded within the application area; *Indigofera* sp. Bungaroo Creek Priority 3 (P3), *Acacia bromilowiana* Priority 4 (P4) and *Goodenia nuda* P4 (Biota Environmental Sciences, 2010a). The P3 Flora species *Indigofera* sp. Bungaroo Creek was found at 33 locations, which were scattered throughout creeks (vegetation types B4, C1, C2 and C5) within the application area. Potential impacts to this Priority Flora species may be minimised through the implementation of a riparian vegetation management condition. This species has been recorded from several locations in the vicinity of the greater Brockman area including further regional areas (Biota Environmental Sciences 2008; 2010b). There were approximately 134 individuals of the P4 species *Acacia bromilowiana* recorded from 11 locations within the application area. Associated with the vegetation type EIAmAexTwERIm, this species has been recorded in the locality during other flora surveys of the Brockman Syncline 2 area (Biota Environmental Sciences, 2010a; Pilbara Iron 2008a; 2008b). The clearing of 41 hectares of native vegetation within a 1,712 hectare application area is not likely to significantly influence the conservation status of these flora species as their habitat type is well represented in a local and regional context within the Hamersley subregion (Biota Environmental Sciences, 2010a; GIS Database).

There are no Threatened Flora species, Threatened Ecological Communities or Priority Ecological Communities recorded within the application area (GIS Database).

There were 15 species of weeds identified during the survey (Stratagen Environmental Consultants, 2011). Weeds have the potential to significantly change the dynamics of a natural ecosystem and lower the biodiversity of an area. Potential impacts to biodiversity as a result of the proposed clearing may be minimised by the implementation of a weed management condition.

There were three faunal habitats identified within the application area (Biota Environmental Sciences, 2010a). All of the habitats within the application area are considered to be common and widespread within the subregion and faunal assemblages are unlikely to be different to that found in similar habitat located elsewhere in the region (Biota Environmental Sciences, 2010a). The clearing of 47 hectares of native vegetation within a 1,712 hectare application area is unlikely to have a significant impact on fauna in a regional or local context.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology Biota Environmental Sciences (2005a)
Biota Environmental Sciences (2007a)
Biota Environmental Sciences (2007b)
Biota Environmental Sciences (2008)
Biota Environmental Sciences (2010a)
Biota Environmental Sciences (2010b)
CALM (2002)
DEC (2012)
Halpern Glick Maunsell (1999)
Keighery (1994)
Stratagen Environmental Consultants (2011)
GIS Database:
- IBRA WA (Regions - Subregions)
- Pre-European vegetation
- Threatened Ecological Sites Buffered

(b) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia.

Comments **Proposal is not likely to be at variance to this Principle**
There were three broad fauna habitat types recorded within the survey area by Biota Environmental Sciences (2010a);

1. Hills;
2. Plains; and
3. Drainage Areas and Creeks.

Biota Environmental Sciences (2010a) identified the vegetation condition to be 'degraded' to 'very good' (Keighery, 1994). The landforms and habitat found within the application area is considered as being well represented in the Pilbara bioregion (Biota Environmental Sciences, 2010a). The application area contains the drainage area/creekline habitats that are ecologically significant. Stratagen Environmental Consultants (2011) state that Hamersley Iron Pty Ltd estimate that only 9.9 hectares of riparian vegetation associated with the drainage area/creekline habitats will be disturbed.

The calcareous outcrops which occur in the plains fauna habitat have been identified by Biota Environmental Sciences (2005b) as a fauna habitat of local significance. Calcrete outcrops were regarded by Biota

Environmental Sciences (2005b) as being of particular significance for stygal, troglobitic and land snail communities. The calcrete outcrops are associated with the P9 vegetation type, which encompasses 27.1 hectares within the application area. Only a small amount of this vegetation type (an estimated maximum of 1.8 hectares) is expected to be disturbed (Stratagen Environmental Consultants, 2011). The habitats present within the broader application area are well represented within the locality and Hamersley sub-region (Biota Environmental Sciences, 2005b; 2010a).

Biota Environmental Sciences (2010a) prepared a biological review identifying potentially occurring fauna species in the application area. There were 17 species of conservation significance identified as potentially occurring within the application area. Of these species, the Australian Bustard (*Ardeotis australis*), Northern Quoll (*Dasyurus hallucatus*) and Western Pebble-mound Mouse (*Pseudomys chapmani*) may use the study area for foraging as part of a larger territory area (Biota Environmental Sciences, 2010a; Stratagen Environmental Consultants, 2011). The habitat present within the application areas is not considered significant habitat for these species (Biota Environmental Sciences 2005b; 2010a). The proposed clearing of 41 hectares of native vegetation is not likely to impact critical feeding or breeding habitat for any conservation significant fauna species as the application area does not contain significant habitat for the potential species.

The nature of the project requires the construction of trenches to bury the 23 kilometre long water pipeline 0.6 metres below the surface and 1.2 metres below creeks (Stratagen Environmental Consultants, 2011). To mitigate the potential impact of fauna being trapped if they fall into the open trench during construction are open sections of trench will be limited to one kilometre at any one time. Animal ramps will be installed at regular intervals to enable trapped individuals to escape, and the trenches will be checked each morning before commencement of work and animals relocated out of the construction area (Stratagen Environmental Consultants, 2011). A Fauna Management Plan is being drafted by Hamersley Iron Pty Ltd which will outline the procedures to follow during trenching and pipeline construction.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology Biota Environmental Sciences (2005b)
Biota Environmental Sciences (2010a)
Stratagen Environmental Consultants (2011)
Keighery (1994)

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

Comments Proposal is not likely to be at variance to this Principle

According to available databases, there are no records of Threatened Flora within the application area (GIS Database). A search of the Department of Environment and Conservation's Threatened and Priority Flora databases identified no Threatened Flora species as occurring within a 20 kilometre radius of the application area (DEC, 2012).

Biota Environmental Sciences (2010a) conducted a systematic rare flora survey of the application area during June 2010. No Threatened Flora was recorded within the survey area.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology Biota Environmental Sciences (2010a)
DEC (2012)
GIS Database:
- Threatened and Priority Flora List

(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.

Comments Proposal is not likely to be at variance to this Principle

A search of the available databases shows that the application area sits within the buffer zone of a Threatened Ecological Community (TEC) (GIS Database).

The TEC is the 'Themeda Grasslands' (CALM, 2002), and the vegetation complex associated with this TEC was not identified by Biota Environmental Services (2010a) within the application area.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology Biota Environmental Sciences (2010a)
CALM (2002)
GIS Database
- Threatened Ecological Sites Buffered

(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.

Comments Proposal is not at variance to this Principle

The application area falls within the Pilbara IBRA bioregion (GIS Database). The vegetation within the application area is recorded as:

Beard vegetation association 18: Low woodland; mulga (*Acacia aneura*);

Beard vegetation association 82: Hummock grasslands, low tree steppe; snappy gum over *Triodia wiseana*; and

Beard vegetation association 175: Short bunch grassland - savanna/grass plain (Pilbara) (Government of Western Australia, 2011; GIS Database).

According to the Government of Western Australia (2011), Beard vegetation associations 18, 82 and 175 retain approximately 99% of their pre-European extent. The local area has been extensively cleared, however the area proposed to be cleared is not a significant remnant of native vegetation.

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in IUCN Class I-IV Reserves
IBRA Bioregion - Pilbara	17,804,427	17,729,352	~99.58	Least Concern	6.32
Beard vegetation associations - State					
18	19892305	19843823	~99.76	Least Concern	2.13
82	2565901	2553217	~99.51	Least Concern	10.24
175	526203	523800	~99.54	Least Concern	4.22
Beard vegetation associations - Bioregion					
18	676,557	672,424	~99.39	Least Concern	16.79
82	2,563,583	2,550,899	~99.51	Least Concern	10.25
175	507,033	506,626	~99.92	Least Concern	4.38

* Government of Western Australia (2011)

** Department of Natural Resources and Environment (2002)

Methodology Based on the above, the proposed clearing is not at variance to this Principle.

Department of Natural Resources and Environment (2002)

Government of Western Australia (2011)

GIS Database:

- IBRA WA (regions - subregions)

- Pre-European Vegetation

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

Comments Proposal is at variance to this Principle

Based on vegetation mapping by Biota Environmental Sciences (2005a; 2007a; 2007b; 2008; 2010a; 2010b; Halpern Glick Maunsell, 1999), the vegetation types C1, C2, C5, C6, C9, C10, C11, C12, C17 and ExAbAatAmTe are riparian vegetation types associated with drainage lines. There are several minor ephemeral drainage lines which intersect the application area (GIS Database). These drainage lines only flow after major rainfall events (Biota Environmental Sciences, 2010a). The condition of the riparian vegetation type is classified as 'degraded' to 'very good' (Keighery, 1994; GIS Database).

The application area intersects a small portion of the Boolgeeda Creek in the southern section, which comprises the main drainage feature in the locality (GIS Database). This area supports the C1 and C2 vegetation types that are associated with 'major ephemeral watercourse' ecosystems at risk (CALM, 2002) and represent major surface drainage features (primarily Boolgeeda Creek). These habitats support numerous species which are restricted, including phreatophytic species such as *Eucalyptus victrix* (Biota Environmental Sciences, 2005b). These vegetation units are susceptible to degradation from weed infestation, cattle grazing and trampling pressures, which have been observed within the drainage feature by Biota Environmental Sciences (2005b), classifying the vegetation as a 'good' condition (Keighery, 1994). Vegetation types C6 and

C17 are also considered to be of moderate conservation significance (Stratagen Environmental Consultants, 2011).

The total estimated area of riparian vegetation to be cleared is 9.9 hectares (Stratagen Environmental Consultants, 2011). A maximum of approximately 15, 9, 7 and 8 percent of the area surveyed of the vegetation types C1, C2, C6 and C17 respectively, is estimated to be cleared. Provided disturbance to riparian habitats is avoided or minimised where possible, natural flow regimes are maintained along creeklines and strict weed hygiene procedures are followed, the proposed works are not expected to substantially impact these vegetation units. Potential impacts to riparian vegetation may be minimised through the implementation of a riparian vegetation management condition.

Based on the above, the proposed clearing is at variance to this Principle.

Methodology Biota Environmental Sciences (2005a)
Biota Environmental Sciences (2005b)
Biota Environmental Sciences (2007a)
Biota Environmental Sciences (2007b)
Biota Environmental Sciences (2008)
Biota Environmental Sciences (2010a)
Biota Environmental Sciences (2010b)
CALM (2002)
Halpern Glick Maunsell (1999)
Keighery (1994)
Stratagen Environmental Consultants (2011)
GIS Database:
- Geodata, Lakes
- Hydrography, Linear

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

Comments Proposal is not likely to be at variance to this Principle

The application area intercepts the Boolgeeda, Newman and River land systems (GIS Database).

The Boolgeeda land system is characterised by stony lower slopes and plains below hill systems supporting hard and soft spinifex grasslands and mulga shrublands. The vegetation is generally not prone to degradation and the system is not susceptible to erosion (Van Vreeswyk et al., 2004).

The Newman land system is characterised by rugged jaspilite plateaux, ridges and mountains supporting hard spinifex grasslands. This Newman land system soils are not particularly prone to soil erosion (Van Vreeswyk et al., 2004).

The River land system is characterised by active flood plains and major rivers supporting grassy Eucalypt woodlands, tussock grasslands and soft spinifex grasslands. Buffel grass and soft spinifex on this system are highly and moderately preferred respectively by livestock. The system is largely stabilised by buffel and spinifex and accelerated erosion is uncommon. However, susceptibility to erosion is high or very high if vegetative cover is removed (Van Vreeswyk et al., 2004). Potential impacts to riparian vegetation may be minimised through the implementation of a riparian vegetation management condition.

The clearing of 41 hectares of native vegetation within an application area of 1, 712 hectares is not likely to result in any water erosion, waterlogging, wind erosion or salinity.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology Van Vreeswyk et al. (2004)
GIS Database:
- Rangeland Land System Mapping

(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.

Comments Proposal is not likely to be at variance to this Principle

The application area is not located within any conservation area (GIS Database). The nearest conservation area is Karijini National Park, located approximately 60 kilometres east of the application area (GIS Database).

Given the distance of the application area from the Karijini National Park, the proposed clearing is not likely to provide a significant ecological linkage or fauna movement corridor and is not likely to impact the environmental values of the conservation area.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology GIS Database:
- DEC Tenure

(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.

Comments Proposal is not likely to be at variance to this Principle

The application area is not located within a Public Drinking Water Source Area (GIS Database). The application areas are located within the proclaimed Pilbara groundwater area under the *Rights in Water and Irrigation Act 1914* (GIS Database). Any groundwater extraction and/or taking or diversion of surface water for the purposes other than domestic and/or stock watering is subject to licence by the Department of Water.

Several drainage tracts transect the application areas (GIS Database). The drainage patterns in the surrounding area have been impacted by existing railway activities and infrastructure. These drainage tracts are dry for most of the year and only flow and hold surface water for short durations following significant rainfall events (CALM, 2002). The installation of the buried pipeline, especially around the Boolgeeda Creek section, will be carried out preferentially during the dry season so that no alteration of the flow will be required to facilitate construction. The access road alongside the pipeline will follow topography, with no construction of bridges or other forms of creek crossing (Strategen Environmental Consultants, 2011). The excavation of the pipeline trench and installation of the pipe will be done in not more than one kilometre lengths, with excavated material being screened and re-used as backfill material (Strategen Environmental Consultants, 2011).

Sediment loads are typically high in flowlines in the Pilbara following large rainfall events and any increase to the sediment load caused by the proposed clearing is likely to be negligible (CALM, 2002). The application area has a groundwater salinity that ranges from potable to marginal (500 - 1,000 milligrams/Litre Total Dissolved solids (TDS) (GIS Database). The proposed clearing of 41 hectares of native vegetation over an application area of 1,712 hectares is unlikely to further deteriorate the quality of underground water (GIS Database).

If clearing of riparian vegetation is required there may be some localized short term sedimentation during the clearing process, however, this is not likely to be an ongoing issue. Potential impacts to riparian vegetation may be minimised through the implementation of a riparian vegetation management condition. The clearing of vegetation as a result of this proposal is therefore unlikely to result in any further deterioration in surface or groundwater quality in the local area.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology CALM (2002)
Strategen Environmental Consultants (2011)
GIS Database:
- Geodata, Lakes
- Hydrography, Linear
- Public Drinking Water Source Areas
- RIWI Act, Groundwater Areas
- Groundwater Salinity, Statewide

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

Comments Proposal is not likely to be at variance to this Principle

The application area experiences a semi-desert tropical climate, with an annual average rainfall of approximately 460.30 millimetres per year (CALM, 2002; BoM, 2012). Based on an average annual evaporation rate of 3,200 - 3,600 millimetres (BoM, 2012), any surface water resulting from rainfall events is likely to be relatively short lived.

Given the size of the area to be cleared (41 hectares) compared to the size of the Ashburton catchment area (7,877,743 hectares) (GIS Database) it is not likely that the proposed clearing will lead to an appreciable increase in run off, and subsequently cause or exacerbate the incidence or intensity of flooding.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology BoM (2012)
CALM (2002)
GIS Database:
- Hydrographic Catchments - Catchments

Planning instrument, Native Title, Previous EPA decision or other matter.

Comments

There are two Native Title claims over the area under application. The claim WC01/5 was registered with the

National Native Title Tribunal on 29 November 2001. The claim WC97/89 was determined by the Federal Court on 1 March 2007. 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 are seven registered Aboriginal Sites of Significance within the application area (Site IDs: 25108, 25105, 25106, 24835, 24836, 31595 and 22323 (GIS Database). 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.

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

The clearing permit application was advertised on 16 July 2012 by the Department of Mines and Petroleum inviting submissions from the public. One submission was received in relation to this application regarding an extension of the comment period. A written response was provided on the matters raised.

Methodology GIS Database:

- Aboriginal Sites of Significance
- Native Title Claims - Determined by the Federal Court
- Native Title Claims - Registered with the NNTT

4. References

- Biota Environmental Sciences (2005a) A Vegetation and Flora Survey of the Brockman Syncline 4 Project Area, near Tom Price. Unpublished report prepared for Hamersley Iron Pty Ltd, July 2005.
- Biota Environmental Sciences (2005b) Fauna Habitats and Fauna Assemblage of the Brockman No. 4 Project Area. Unpublished report prepared for Hamersley Iron.
- Biota Environmental Sciences (2007a) A Flora Survey of the Brockman Syncline 4 Rail and Infrastructure Corridor. Unpublished report prepared for Hamersley Iron Pty Ltd, July 2007.
- Biota Environmental Sciences (2007b) A Vegetation and Flora Survey of the Approved Nammuldi Powerline Corridor (East of Brockman Operation), for the BS4 Project. Unpublished report for Pilbara iron Pty Ltd, November 2007.
- Biota Environmental Sciences (2008) Vegetation and Rare Flora of the BS4 33kV Powerline Corridor through the Boolgeeda Valley. Unpublished report prepared for Rio Tinto Iron Ore, March 2008.
- Biota Environmental Sciences (2010a) Brockman Syncline 4 Water Pipeline Corridor Biological Review. Unpublished report prepared for Rio Tinto Iron Ore, August 2010.
- Biota Environmental Sciences (2010b) Summary of Findings from Nammuldi Expansion Areas Flora and Vegetation Survey. Unpublished interim report prepared for Rio Tinto Iron Ore, January 2010.
- BoM (2012) Climate Statistics for Australian Locations. A Search for Climate Statistics for Wittenoom, Australian Government Bureau of Meteorology, viewed 17 August 2012, <http://reg.bom.gov.au/climate/averages/tables/cw_005026.shtml>.
- CALM (2002) A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions. Pilbara 3 (PIL4 - Hamersley subregion) Department of Conservation and Land Management, Western Australia
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5. Glossary

Acronyms:

BoM	Bureau of Meteorology, Australian Government
CALM	Department of Conservation and Land Management (now DEC), Western Australia
DAFWA	Department of Agriculture and Food, Western Australia
DEC	Department of Environment and Conservation, Western Australia
DEH	Department of Environment and Heritage (federal based in Canberra) previously Environment Australia

DEP	Department of Environment Protection (now DEC), Western Australia
DIA	Department of Indigenous Affairs
DLI	Department of Land Information, Western Australia
DMP	Department of Mines and Petroleum, Western Australia
DoE	Department of Environment (now DEC), Western Australia
DoIR	Department of Industry and Resources (now DMP), Western Australia
DOLA	Department of Land Administration, Western Australia
DoW	Department of Water
EP Act	Environmental Protection Act 1986, Western Australia
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Federal Act)
GIS	Geographical Information System
ha	Hectare (10,000 square metres)
IBRA	Interim Biogeographic Regionalisation for Australia
IUCN	International Union for the Conservation of Nature and Natural Resources – commonly known as the World Conservation Union
RIWI Act	Rights in Water and Irrigation Act 1914, Western Australia
s.17	Section 17 of the Environment Protection Act 1986, Western Australia
TEC	Threatened Ecological Community

Definitions:

{Atkins, K (2005). *Declared rare and priority flora list for Western Australia, 22 February 2005*. Department of Conservation and Land Management, Como, Western Australia} :-

- P1** **Priority One - Poorly Known taxa:** taxa which are known from one or a few (generally <5) populations which are under threat, either due to small population size, or being on lands under immediate threat, e.g. road verges, urban areas, farmland, active mineral leases, etc., or the plants are under threat, e.g. from disease, grazing by feral animals, etc. May include taxa with threatened populations on protected lands. Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.
- P2** **Priority Two - Poorly Known taxa:** taxa which are known from one or a few (generally <5) populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.
- P3** **Priority Three - Poorly Known taxa:** taxa which are known from several populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in need of further survey.
- P4** **Priority Four – Rare taxa:** taxa which are considered to have been adequately surveyed and which, whilst being rare (in Australia), are not currently threatened by any identifiable factors. These taxa require monitoring every 5–10 years.
- R** **Declared Rare Flora – Extant taxa (= Threatened Flora = Endangered + Vulnerable):** taxa which have been adequately searched for, and are deemed to be in the wild either rare, in danger of extinction, or otherwise in need of special protection, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.
- X** **Declared Rare Flora - Presumed Extinct taxa:** taxa which have not been collected, or otherwise verified, over the past 50 years despite thorough searching, or of which all known wild populations have been destroyed more recently, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.

{Wildlife Conservation (Specially Protected Fauna) Notice 2005} [Wildlife Conservation Act 1950] :-

- Schedule 1** **Schedule 1 – Fauna that is rare or likely to become extinct:** being fauna that is rare or likely to become extinct, are declared to be fauna that is need of special protection.
- Schedule 2** **Schedule 2 – Fauna that is presumed to be extinct:** being fauna that is presumed to be extinct, are declared to be fauna that is need of special protection.
- Schedule 3** **Schedule 3 – Birds protected under an international agreement:** being birds that are subject to an agreement between the governments of Australia and Japan relating to the protection of migratory birds and birds in danger of extinction, are declared to be fauna that is need of special protection.
- Schedule 4** **Schedule 4 – Other specially protected fauna:** being fauna that is declared to be fauna that is in need of special protection, otherwise than for the reasons mentioned in Schedules 1, 2 or 3.

{CALM (2005). *Priority Codes for Fauna*. Department of Conservation and Land Management, Como, Western Australia} :-

- P1** **Priority One: Taxa with few, poorly known populations on threatened lands:** Taxa which are known from few specimens or sight records from one or a few localities on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, active mineral leases. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
- P2** **Priority Two: Taxa with few, poorly known populations on conservation lands:** Taxa which are known from few specimens or sight records from one or a few localities on lands not under immediate threat of habitat destruction or degradation, e.g. national parks, conservation parks, nature reserves, State forest, vacant Crown land, water reserves, etc. The taxon needs urgent survey and evaluation of conservation

status before consideration can be given to declaration as threatened fauna.

- P3** **Priority Three: Taxa with several, poorly known populations, some on conservation lands:** Taxa which are known from few specimens or sight records from several localities, some of which are on lands not under immediate threat of habitat destruction or degradation. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
- P4** **Priority Four: Taxa in need of monitoring:** Taxa which are considered to have been adequately surveyed, or for which sufficient knowledge is available, and which are considered not currently threatened or in need of special protection, but could be if present circumstances change. These taxa are usually represented on conservation lands.
- P5** **Priority Five: Taxa in need of monitoring:** Taxa which are not considered threatened but are subject to a specific conservation program, the cessation of which would result in the species becoming threatened within five years.

Categories of threatened species (*Environment Protection and Biodiversity Conservation Act 1999*)

- EX** **Extinct:** A native species for which there is no reasonable doubt that the last member of the species has died.
- EX(W)** **Extinct in the wild:** A native species which:
(a) is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or
(b) has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.
- CR** **Critically Endangered:** A native species which is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.
- EN** **Endangered:** A native species which:
(a) is not critically endangered; and
(b) is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.
- VU** **Vulnerable:** A native species which:
(a) is not critically endangered or endangered; and
(b) is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.
- CD** **Conservation Dependent:** A native species which is the focus of a specific conservation program, the cessation of which would result in the species becoming vulnerable, endangered or critically endangered within a period of 5 years.